



AUTOMOTIVE





DIODES AUTOMOTIVE



COMPANY OVERVIEW

DIODES INCORPORATED'S DISCRETE, ANALOG, MIXED-SIGNAL, AND LOGIC PRODUCTS PROVIDE OUR CUSTOMERS WITH LEADING EDGE SOLUTIONS FOR NEXT GENERATION SYSTEMS.

Discrete products include Bipolar Transistors, MOSFETs, Diodes and Rectifiers, Protection products and Functional Specific Arrays.

Analog and Mixed-Signal products cover these main areas: Power Management ICs, Standard Linear, LED Drivers, Sensors and Motor Control, Switching, Signal Integrity, Connectivity and Timing products.

Our Logic products include Single-Gate, Dual-Gate and Standard-Logic Gates as well as Level Translators, Analog Switches, Registers and Multiplexers.

SEMICONDUCTORS FORM AN INTEGRAL PART OF MODERN AUTOMOBILES. A TYPICAL VEHICLE MAY HAVE UP TO 100 ELECTRONIC CONTROL UNITS (ECUs) EMBEDDED IN SYSTEMS INCLUDING THOSE GOVERNING ENGINE, TRANSMISSION, ACTIVE SAFETY, PASSENGER COMFORT AND INFOTAINMENT.

Diodes Incorporated (Diodes) has a wide portfolio of automotive-compliant analog, discrete, and timing products.

These automotive parts are clearly identified by a 'Q' at the end of the part number.

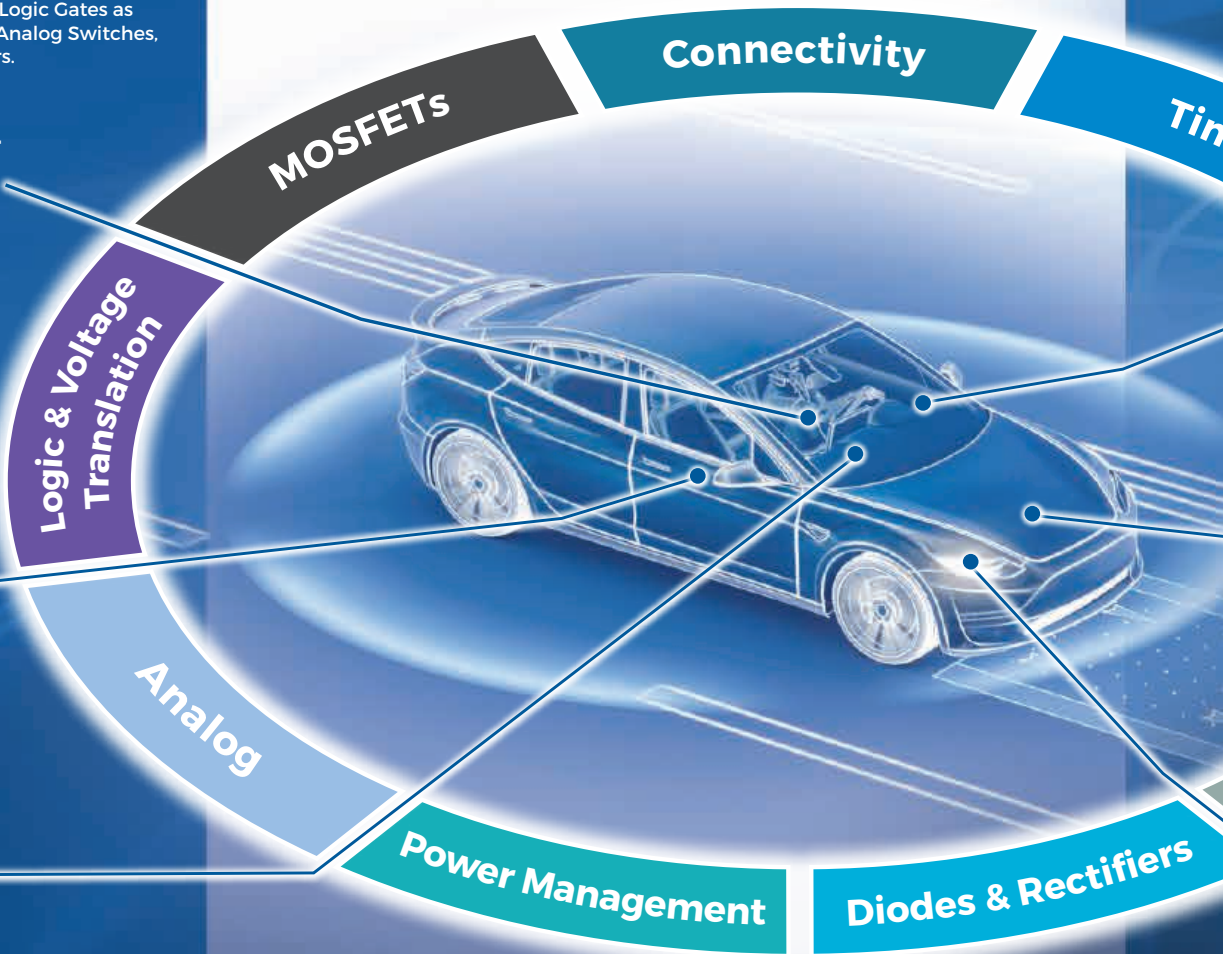
Diodes' fully automotive-compliant 'Q' parts are all qualified to AEC-Q100, AEC-Q101, AEC-Q104, and AEC-Q200 respectively, are manufactured in facilities certified to the rigorous IATF 16949 standard, and capable of customer audit to VDA6.3.

These parts are all supported by Production Part Approval Process (PPAP) documentation, thus meeting all the requirements of the automotive electronics industry.

INFOTAINMENT & TELEMATICS

MOTOR CONTROL MODULES

BODY CONTROL ELECTRONICS





AUTOMOTIVE

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ADVANCED
DRIVER
ASSISTANCE
SYSTEMS

POWER TRAIN

INTERIOR
AND EXTERIOR
LIGHTING

Timing

Protection

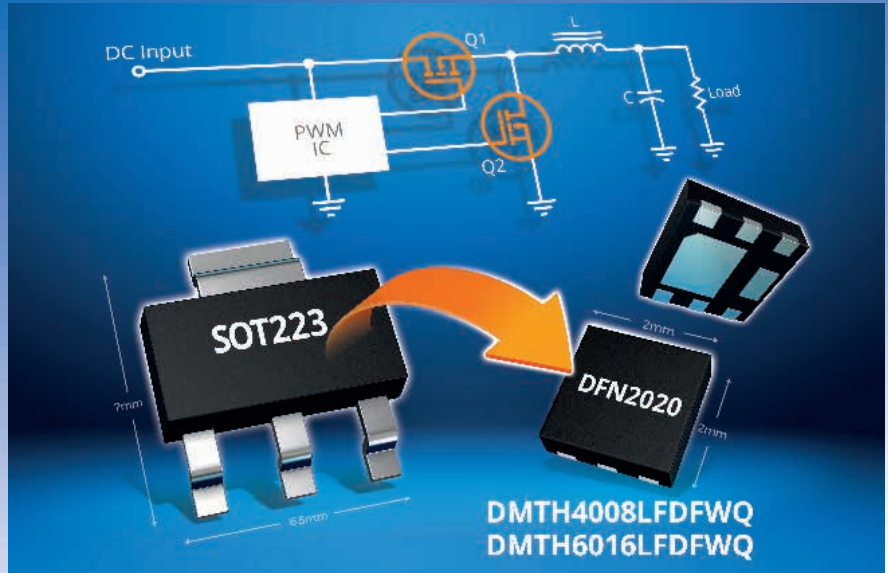
Transistors

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MOSFETs AUTOMOTIVE 'Q' PORTFOLIO

THE DIODES™ ADVANTAGE

- DMTHxxxQ Series**
 Optimized for low figure of merit ($R_{DS(ON)} * Q_G$) to minimize switching losses
- Qualified to 175°C**
 Suitable for use in high-ambient environments
- 100% Avalanche Tested**
 Ensures robust design able to withstand reverse avalanche energy from inductive loads
- AEC-Q101**
 Qualified to AEC-Q101 to ensure high reliability
- PPAP Supported**
 Production Part Approval Process documents supplied



HIGH-TEMPERATURE N MOSFET AUTOMOTIVE 'Q' PORTFOLIO

Part Number	Polarity	V _{DS} (V)	V _{GS} (V)	I _D (A)	V _{GS} TH (V)	R _{DS(ON)} max (mΩ)		Q _G (nC) Typ @ V _{GS} = 10V	C _{ISS} (pf) Typ @ 1/2V _{DS}	E _{AS} (mJ)	I _{AS} (A)	T _J (°C)	Package	Availability
						@10V	@4.5V							
DMTH31M7LPSQ	N	30	20	100	1 to 3	1.7	2.4	5741	90	215	65	175	PowerDI5060	Released
DMTH32M5LPSQ	N	30	20	170	1 to 3	2.2	3.2	68	3944	140	50	175	PowerDI5060	Released
DMTH3004LPSQ	N	30	20	145	1 to 3	3.8	6	44	2370	110	11	175	PowerDI5060	Released
DMTH3004LK3Q	N	30	20	75	1 to 3	4	7	44	2370	110	11	175	TO252 (DPAK)	Released
DMTH3004LFGQ	N	30	20	91	1 to 3	5.5	8.5	44	2370	110	11	175	PowerDI3333	Released
DMTH4M70SPGWQ	N	40	20	460	2 to 4	0.7	-	117	10053	924	43	175	PowerDI8080	Released
DMTH4001STLWQ	N	40	20	300	2 to 4	0.85	-	150	13185	876	76	175	PowerDI1012S	Q4 2022
DMTH41M2SPSQ	N	40	20	TBC	2 to 4	1.2	-	144	10737	440	94	175	PowerDI5060	Q4 2022
DMTH41M8SPSQ	N	40	20	100	2 to 4	1.8	-	79	6968	265	73	175	PowerDI5060	Released
DMTH4004LPSQ	N	40	20	100	1 to 3	2.5	5	69	5220	283	53	175	PowerDI5060	Released
DMTH4004SPSQ	N	40	20	100	2 to 4	2.7	-	60	3714	200	45	175	PowerDI5060	Released
DMTH42M3LPSQ	N	40	20	204	1 to 3	2.8	-	88	5769	480	31	175	PowerDI5060	Q4 2022
DMTH4004LK3Q	N	40	20	100	1 to 3	3	5	83	4450	120	30	175	TO252 (DPAK)	Released
DMTH4002SCTBQ	N	40	20	192	2 to 4	3	-	77.5	7180	551	19.2	175	TO63 (D2PAK)	Released
DMTH4004SCTBQ	N	40	20	100	2 to 4	3	-	67	4305	200	45	175	TO63 (D2PAK)	Released
DMTH43M8LFGQ	N	40	20	100	1 to 2.5	3	5	40	2798	165	13	175	PowerDI3333	Released
DMTH4004SK3Q	N	40	20	100	2 to 4	3.2	-	68.6	4305	160	40	175	TO252 (DPAK)	Released
DMTH43M8LPSQ	N	40	20	100	1 to 2.5	3.3	5	38.5	2693	87	13	175	PowerDI5060	Released
DMTH43M8LK3Q	N	40	20	119	1 to 2.4	3.6	5.2	38	2693	87	13	175	TO252 (DPAK)	Released
DMTH4005SPSQ	N	40	20	90	2 to 4	3.7	-	49	3062	53	32	175	PowerDI5060	Released
DMTH43M8LPDWQ	N+N	40	20	110	1 to 2.5	4.2	6	41.9	2796	97	44	175	PowerDI5060 (SWP)	Q4 2022
DMTH4005SK3Q	N	40	20	90	1 to 4	4.5	-	49	3062	53	32	175	TO252 (DPAK)	Released
DMTH45M5LFVWQ	N	40	20	71	1.2 to 2.2	5.5	7.9	13.9	978	19.2	19.6	175	PowerDI3333 (SWP)	Released
DMTH45M5LPSWQ	N	40	20	86	1.2 to 2.3	5.5	7.9	13.9	978	19.2	18.4	175	PowerDI5060 (SWP)	Released
DMTH45M5LPDWQ	N+N	40	20	79	1.2 to 2.3	5.5	7.9	13.9	978	19.6	19.8	175	PowerDI5060 (SWP)	Released
DMTH45M5SPSWQ	N	40	20	71	2 to 3.5	5.5	-	13.2	1083	20.6	20.3	175	PowerDI3333 (SWP)	Released
DMTH45M5SPSWQ	N	40	20	86	2 to 3.5	5.5	-	13.2	1083	20.6	20.3	175	PowerDI5060 (SWP)	Released

PowerDI is a registered trademark of Diodes Incorporated SWP: Side Wall Plated Package

HIGH-TEMPERATURE N MOSFET AUTOMOTIVE 'Q' PORTFOLIO

Part Number	Polarity	V _{DS} (V)	V _{GS} (V)	I _D (A)	V _{GSTH} (V)	R _{DS(ON)} max (mΩ)		Q _G (nC) Typ @ V _{GS} = 10V	C _{ISS} (pF) Typ @ 1/2V _{DS}	E _{AS} (mJ)	I _{AS} (A)	T _J (°C)	Package	Availability
						@10V	@4.5V							
DMTH45M5SPDWQ	N+N	40	20	79	2 to 3.5	5.5	-	13.2	1083	20.6	20.3	175	PowerDI5060(SWP)	Released
DMTH4007LPSQ	N	40	20	100	1 to 3	6.5	9.8	29	2492	20	20	175	PowerDI5060	Released
DMTH4007LK3Q	N	40	20	70	1 to 3	7.3	9.8	29	1895	20	20	175	TO252 (DPAK)	Released
DMTH47M2LPSWQ	N	40	20	73	1.2 to 2.3	7.3	12	14	891	24	22	175	PowerDI5060 (SWP)	Released
DMTH47M2SPSWQ	N	40	20	73	2 to 4	7.5	-	12.1	897	30.5	24.7	175	PowerDI5060 (SWP)	Released
DMTH48M3SFVWQ	N	40	20	TBC	2 to 4	8.3	-	12	897	35	27	175	PowerDI3333 (SWP)	Released
DMTH4007SPDQ	N+N	40	20	18	2 to 4	8.6	-	42	2026	89	24	175	PowerDI5060	Released
DMTH47M2LFVWQ	N	40	20	49	1.2 to 2.5	8.9	13.5	12.3	881	24	22	175	PowerDI5060 (SWP)	Released
DMTH4008LPSQ	N	40	20	65	1 to 3	8.8	13	15	1088	25	22	175	PowerDI5060	Released
DMT47M2SLDVQ	N+N	40	20	30	1.2 to 2.3	11	15	14	891	24	22	150	PowerDI3333	Released
DMTH4008LDFVWQ	N	40	20	12	1 to 3	11.5	18	14	1030	32	14	175	DFN2020-6	Released
DMTH4011SPDQ	N+N	40	20	55	1 to 3	12	18.5	15	767	238	30	175	PowerDI5060	Released
DMTH4008LPDWQ	N+N	40	20	31	1 to 3	12.3	20	17.6	1000	27	23	175	PowerDI5060 (SWP)	Released
DMTH4014LFVWQ	N	40	20	55	1 to 3	14	19	15	767	21	12	175	PowerDI3333 (SWP)	Released
DMTH4014LPSWQ	N	40	20	43.5	1 to 3	14.5	25	11.2	750	19.6	19.8	175	PowerDI5060 (SWP)	Released
DMTH4014SPSWQ	N	40	20	43.5	2 to 4	14.8	-	10.6	805	19.4	19.7	175	PowerDI5060 (SWP)	Released
DMTH4014LDVWQ	N+N	40	20	39	1 to 3	15	25	11.2	750	19.6	19.8	175	PowerDI3333 (SWP)	Released
DMTH4014LPDQ	N+N	40	20	44	1 to 3	15	25	10	733	21	12	175	PowerDI5060	Released
DMTH61M5SPSWQ	N	60	20	225	2 to 4	1.5	-	131	8306	641	36	175	PowerDI5060 (SWP)	Released
DMTH61M8LPSQ	N	60	20	100	2 to 4	1.6	-	131	8306	641	36	175	PowerDI5060	Released
DMTH6002LPSWQ	N	60	20	100	1 to 3	2	3.3	131	8289	661	21	175	PowerDI5060	Released
DMTH6004LPSQ	N	60	20	100	1 to 3	3.1	4.5	96	4515	160	40	175	PowerDI5060	Released
DMTH6004SPSQ	N	60	20	100	2 to 4	3.1	-	95	4556	200	45	175	PowerDI5060	Released
DMTH6004SCTBQ	N	60	20	100	2 to 4	3.4	-	95	4556	200	45	175	TO263 (D2PAK)	Released
DMTH6004SK3Q	N	60	20	95	2 to 4	3.8	-	95	4556	200	45	175	TO252 (DPAK)	Released
DMTH6005LFGQ	N	60	20	100	1 to 2.5	4.1	7	49	3150	171	18	175	PowerDI3333	Q4 2022
DMTH6005LPSQ	N	60	20	100	1 to 3	5.5	10	47	2962	98	15	175	PowerDI5060	Released
DMTH6005LK3Q	N	60	20	90	1 to 3	5.6	10	47	2962	98	15	175	TO252 (DPAK)	Released
DMTH6006LPSWQ	N	60	20	100	1.2 to 2.5	6.5	10	35	2162	41	28	175	PowerDI5060 (SWP)	Released
DMTH6010SK3Q	N	60	20	70	2 to 4	8	-	30	2841	20	27	175	TO252 (DPAK)	Released
DMTH6010LK3Q	N	60	20	50	1 to 3	8	12	41	2090	20	20	175	TO252 (DPAK)	Released
DMTH6010LPSWQ	N	60	20	50	1 to 3	8	12	41	2090	20	20	175	PowerDI5060 (SWP)	Released
DMTH69M8LFVWQ	N	60	20	45	1 to 3	9.5	13	33	1925	45	30	175	PowerDI3333 (SWP)	Released
DMTH6009LK3Q	N	60	20	59	0.7 to 2	10	13	33	1925	20	20	175	TO252 (DPAK)	Released
DMTH6009LPSQ	N	60	20	89.5	0.7 to 2	10	13	33	1925	20	20	175	PowerDI5060	Released
DMTH6010LPDQ	N+N	60	20	48	1 to 3	11	16	40	2615	20	20	175	PowerDI5060	Released
DMTH6012LPSWQ	N	60	20	51	1 to 2.3	14	21	14	785	8	13	175	PowerDI5060 (SWP)	Released
DMTH6016LPSQ	N	60	20	37	1 to 3	16	24	8	864	12	15	175	PowerDI5060	Released
DMTH6016LFVWQ	N	60	20	41	1 to 3	16	27	15	939	12	15	175	PowerDI3333 (SWP)	Released
DMTH6016LK3Q	N	60	20	46	1 to 3	17	24	8	864	12	15	175	TO252 (DPAK)	Released
DMTH6016LDFVWQ	N	60	20	9	1 to 3	18	27.5	15	925	12	15	175	DFN2020-6 (SWP)	Released
DMTH6016LPDQ	N+N	60	20	8	2 to 2.5	19	28	17	864	12	15	175	PowerDI5060	Released
DMTH6016LSDQ	N+N	60	20	8	1 to 2.5	19.5	28	17	864	12	15	175	SO-8	Released
DMTH6015LPDWQ*	N+N	60	20	36.3	1.3 to 2.5	20	27	14.3	825	20.8	20.4	175	PowerDI5060	Released
DMTH6015LDVWQ*	N+N	60	20	19.7	1.3 to 2.5	20.5	27	14.3	825	20.8	20.4	175	PowerDI3333	Released
DMTH8001STLWQ	N	80	20	231	2 to 4	1.7	-	138	8894	1104	47	175	PowerDI1012S	Released
DMTH8003STLWQ	N	80	20	239	2 to 4	2.5	-	136.5	8614	800	73	175	PowerDI1012S	Q3 2022
DMTH84M1SPSQ	N	80	20	100	2 to 4	4	5.7@6V	63	4209	264	23	175	PowerDI5060	Released

* = ESD gate protection diodes

HIGH-TEMPERATURE N MOSFET AUTOMOTIVE 'Q' PORTFOLIO

Part Number	Polarity	V _{DS} (V)	V _{GS} (V)	I _D (A)	V _{GS(TH)} (V)	R _{DS(ON)} max (mΩ)		Q _G (nC) Typ @ V _{GS} = 10V	C _{ISS} (pf) Typ @ 1/2V _{DS}	E _{AS} (mJ)	I _{AS} (A)	T _J (°C)	Package	Availability
						@10V	@4.5V							
DMTH8008LFGQ	N	80	20	70	1.2 to 2.5	6.9	10.4	38	2254	162	18	175	PowerDI3333	Released
DMTH8008SFGQ	N	80	20	68	2 to 4	7	10@6v	32	1945	175	18.7	175	PowerDI3333	Released
DMTH8008SPSQ	N	80	20	92	2 to 4	7.8	-	34	1950	80	40	175	PowerDI3333	Released
DMTH8008LPSQ	N	80	20	91	1 to 3	7.8	11	41	2345	26	23	175	PowerDI3333	Released
DMTH8012LK3Q	N	80	20	50	1 to 3	16	21	46	2051	147	80	175	TO252 (DPAK)	Released
DMTH8012LPSQ	N	80	20	72	1 to 3	17	21	46	2051	10	12	175	PowerDI5060	Released
DMTH8028LFVWQ	N	80	20	27	1.3 to 2.5	25	41	10	631	23	13	175	PowerDI5060 (SWP)	Released
DMTH8028LPSWQ	N	80	20	42	1.3 to 2.5	25	41	10	641	23	13	175	PowerDI5060 (SWP)	Released
DMTH8030LPDWQ	N+N	80	20	28	1 to 3	26	45	5.4	631	23.4	12.5	175	PowerDI5060 (SWP)	Released
DMTH10H1M7STLWQ	N	100	20	267	2 to 4	2	-	147	9871	800	73	175	PowerDI1012S	Released
DMTH10H2M5STLWQ	N	100	20	248	2 to 4	2.5	-	124	8450	701	68	175	PowerDI1012S	Released
DMTH10H4M5SPSQ	N	100	20	100	2 to 4	4.3	6	80	4843	240	40	175	PowerDI5060	Released
DMTH10H009LPSQ	N	100	20	91	1.2 to 2.5	8	12.5	40	2309	66	21	175	PowerDI5060	Released
DMTH10H010SPSQ	N	100	20	98	2 to 4	8.5	-	54	2592	150	10	175	PowerDI5060	Released
DMTH10H009SPSQ	N	100	20	100	2 to 4	8.9	-	30	2085	181	11	175	PowerDI5060	Released
DMTH10H015SK3Q	N	100	20	53	1.4 to 3.5	14	20@6V	33	2343	85	7.5	175	TO252 (DPAK)	Released
DMTH10H015SPSQ	N	100	20	98	2 to 4	15	19.5@6V	54	2343	13	16	175	PowerDI5060	Released
DMTH10H015LPSQ	N	100	20	44	1 to 3	16	18@6V	33	1871	85	7.5	175	PowerDI5060	Released
DMTH10H017LPDQ	N+N	100	20	60	2 to 4	17	28	14	1968	150	10	175	PowerDI5060	Released
DMTH10H025LK3Q	N	100	20	45	1 to 3	22	30@6V	21	1477	96	8	175	TO252 (DPAK)	Released
DMTH10H025LPSQ	N	100	20	45	1 to 3	23	30@6V	21	1477	96	8	175	PowerDI5060	Released
DMTH10H032LFVWQ	N	100	20	26	1.3 to 2.5	30	50	11.9	683	25.3	13	175	PowerDI5060 (SWP)	Released
DMTH10H032LPSWQ	N	100	20	26	1.3 to 2.5	32	50	11.9	683	25.3	13	175	PowerDI5060 (SWP)	Released
DMTH10H032LPDWQ	N+N	100	20	24	1.3 to 2.5	32	50	11.9	683	25.3	13	175	PowerDI5060 (SWP)	Released
DMTH10H072LFDFWQ	N	100	20	5	1.3 to 2.5	62	80	TBC	TBC	TBC	TBC	175	DFN2020-6	Q1 2023
DMTH12H007SPSWQ	N	120	20	84	2 to 4	8.9	16@6V	44	3142	360.4	15.5	175	PowerDI5060 (SWP)	Q4 2022
DMTH15H017SPSWQ	N	150	20	61	2 to 4	19	-	34	2344	311	14.4	175	PowerDI5060 (SWP)	Q4 2022
DMTH15H017LPSWQ	N	150	20	61	2 to 4	19	25.5	50	3369	315	14.5	175	PowerDI5060 (SWP)	Q4 2022

HIGH-TEMPERATURE MOSFET APPLICATIONS BRUSHLESS DC MOTOR CONTROL

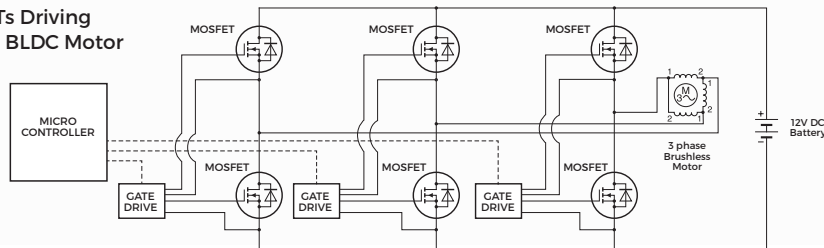
Brushless DC (BLDC) motor control provides improved performance, longer life, reduced noise, and greater ease of use compared to equivalent mechanical solutions.

Consequently, 3-phase BLDC systems are widely used in automotive applications such as fuel pumps, water pumps, anti-lock braking systems (ABS), and provide additional torque for power steering

systems. The motor power depends on the vehicle application and performance.

In BLDC motor systems, MOSFETs are typically configured in a 3-phase bridge arrangement to drive the DC motor and must be capable of handling start-up and stalled motor currents of up to six times the continuous current rating of the motor.

MOSFETs Driving 3-Phase BLDC Motor



THE DIODES™ ADVANTAGE

- **Low R_{DS(ON)}**
Reduced conduction losses
- **Low Q_{GD}**
Reduced switching losses
- **100% Avalanche Rated**
Ensures robust design able to withstand the reverse avalanche energy generated by the BLDC
- **Rated to +175°C**
For use in high-ambient temperature environments
- **Low Thermal Resistance Package**
Maintains low operating temperature

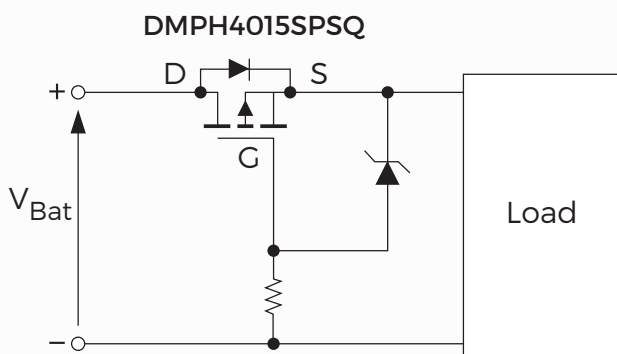
HIGH-TEMPERATURE P MOSFET AUTOMOTIVE 'Q' PORTFOLIO

Part Number	Polarity	V _{DS} (V)	V _{GS} (V)	I _D (A)	V _{GS} TH (V)	R _{DS(ON)} max (mΩ)		Q _G (nC) Typ @ V _{GS} = 10V	C _{ISS} (pf) Typ @ 1/2V _{DS}	E _{AS} (mJ)	I _{AS} (A)	T _j (°C)	Package	Availability
						@10V	@4.5V							
DMPH1006UPSQ	P	-12		-80	-0.4 to -1	6	-	-	6334	-17	-18	175	PowerDI5060	Released
DMPH2040UVTQ	P	-20	12	-5.6	-0.6 to -1.5	-	38	19@8V	834	-	-	175	TSOT26	Released
DMPH33M8SPSWQ	P	-30	20	-100	-1 to -3	3.8	10	127	3775	241	-69	175	PowerDI5050 (SWP)	Released
DMPH3010LK3Q	P	-30	20	-50	-1.1 to -2.1	7.5	10	139	6807	113	-47	175	TO252 (DPAK)	Released
DMPH3010LPSQ	P	-30	20	-50	-1.1 to -2.1	7.5	10	139	6807	113	-47	175	PowerDI5060	Released
DMPH4015SPSQ	P	-40	25	-50	-1.5 to -2.5	10	14	91	4234	260	-22	175	PowerDI5060	Released
DMPH4015SSSQ	P	-40	25	-11.4	-1.5 to -2.5	11	15	91	4234	260	-22	175	SO-8	Released
DMPH4015SK3Q	P	-40	25	-45	-1.5 to -2.5	11	15	91	4234	260	-22	175	TO252 (DPAK)	Released
DMPH4013SPSQ	P	-40	-	-	-1 to -3	13	23	39	4763	260	-22	175	PowerDI5060	Released
DMPH4013SK3Q	P	-40	20	-55	-1 to -3	15	23	31	4004	69	-40	175	TO252 (DPAK)	Released
DMPH4025SFVWQ	P	-40	20	-20	-0.8 to -1.8	25	45	38.6	1918	82	-23	175	PowerDI3333 (SWP)	Released
DMPH4023SK3Q	P	-40	20	-50	-1 to -3	26	-	18.7	1091	85	-40	175	TO252 (DPAK)	Released
DMPH4023SPDQ	P	-40	20	-27	-1 to -3	26	-	18.7	1091	85	-40	175	PowerDI5060	Released
DMPH4029LFCQ	P	-40	20	-22	-1 to 3	29	45	34	1626	32	-25	175	PowerDI3333	Released
DMPH6023SK3Q	P	-60	20	-35	-1 to -3	33	40	53	2569	60	-35	175	TO252 (DPAK)	Released
DMPH6050SSDQ	P+P	-60	20	-5.2	-1 to -3	48	60	30	1525	33	-25	175	SO-8	Released
DMPH6050SPDQ	P+P	-60	20	-26	-1 to -3	48	60	30	1525	30	-21	175	PowerDI5060	Released
DMPH6050SFGQ	P	-60	20	-18	-1 to -3	50	70	24	1293	31	-25	175	PowerDI3333	Released
DMPH6050SK3Q	P	-60	20	-23.6	-1 to -3	50	70	25	1377	31	-25	175	TO252 (DPAK)	Released
DMPH6250SQ	P	-60	20	-2.4	-1 to -3	155	240	8.3	512	-	-	175	SOT23	Released

PowerDI is a registered trademark of Diodes Incorporated.

AUTOMOTIVE 'Q' MOSFETS FOR REVERSE BATTERY PROTECTION

REVERSE BATTERY PROTECTION CIRCUIT



Application Requirements

Protect against reverse polarity connection of the battery during vehicle maintenance. During the reconnection of a vehicle's battery, it is possible to reverse the battery polarities, thus causing damage to the vehicle's electronics.

- Simple, Low-Cost, and Minimal Component Count
- Minimal Power Losses
- Pulse Ruggedness to ISO7637
- AEC-Q101 and PPAP Supported
- EMI Emissions

Key Products: 40V P-Channel MOSFETs

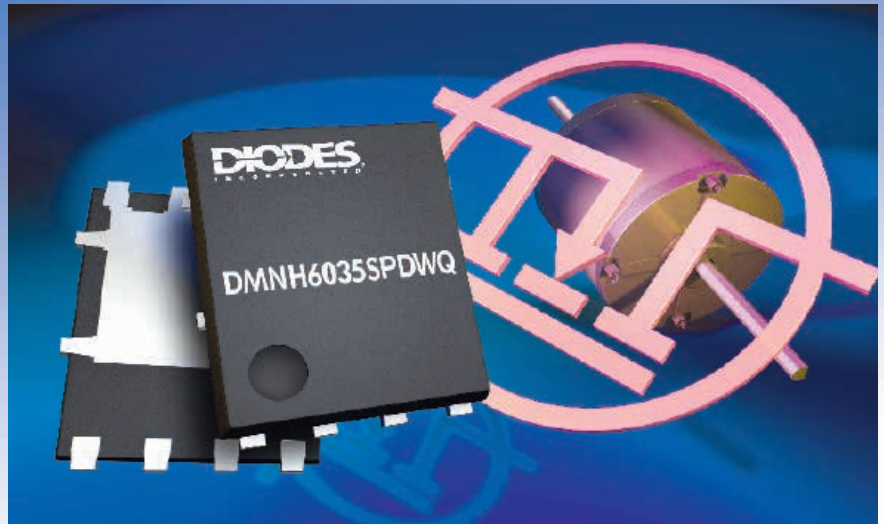
- DMPH4015SPSQ in PowerDI5060.
- DMPH4015SK3Q in TO252 (DPAK).

HIGH-TEMPERATURE PLANAR MOSFET & RELAY DRIVERS

HIGH-TEMPERATURE PLANAR MOSFET AUTOMOTIVE 'Q' PORTFOLIO

THE DIODES™ ADVANTAGE

- DMNHXXXX Q Series**
 Optimized for Safe Operating Area (SOA) and superior avalanche performance for use in applications requiring robust performance
- Qualified to 175°C**
 Suitable for use in high-ambient environments
- 100% Avalanche Tested**
 Ensures robust design able to withstand reverse avalanche energy from inductive loads
- AEC-Q101**
 Qualified to AEC-Q101 to ensure high reliability
- PPAP Supported**
 Production Part Approval Process documents supplied



Part Number	Polarity	V _{DS} (V)	V _{GS} (V)	I _D (A)	V _{GS} TH (V)	R _{DS(ON)} max (mΩ)		Q _C (nC) Typ @ V _{GS} = 10V	C _{ISS} (pf) Typ @ 1/2V _{DS}	E _{AS} (mJ)	I _{AS} (A)	T _J (°C)	Package	Availability
						@10V	@4.5V							
DMNH6035SPDWQ	N+N	60	20	33	1 to 3	35	44	16	879	230	21	175	PowerDI5060/SWP	Released
DMNH6065SPDWQ	N+N	60	20	27	1 to 3	65	79	9.5	466	89	13	175	PowerDI5060/SWP	Released

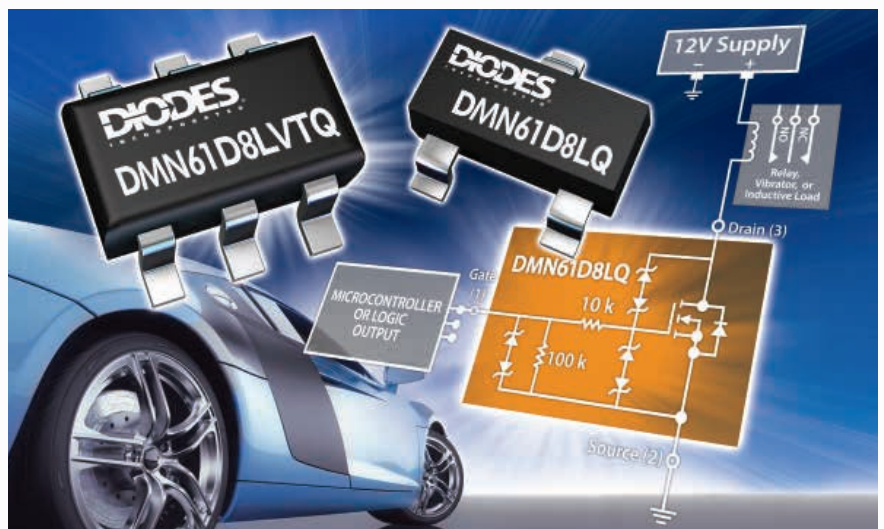
RELAY DRIVERS AUTOMOTIVE 'Q' PORTFOLIO

DMN61D8LQ and DMN61D8LVTQ inductive load-drivers are designed for inductive load-switching applications, such as door relays, solenoids, and small DC motors.

On-chip integrated Zener diodes and bias resistors eliminate the requirement for several external components, saving cost and reducing the PCB footprint.

THE DIODES™ ADVANTAGE

- Integrated Solution**
 Replaces three to four discrete components
- Integrated Active Clamp**
 Eliminates the requirement for external freewheeling diodes



Part Number	Polarity	ESD Diodes Y/N	V _{DS} (V)	V _{GS} (V)	I _D (A)	R _{DS(ON)} @ 5V V _{GS}	R _{DS(ON)} @ 3V V _{GS}	C _{ISS} (Pf) typ @ 1/2 V _{DS}	Q _C (nC) @ V _{GS} = 10V	Package	Availability
DMN61D8LVTQ	N+N	Y	60	12	0.47	1800	2400	12.9	0.74	SOT26	Released
DMN61D8LQ	N	Y	60	12	0.47	1800	2400	12.9	0.74	SOT23	Released

SELF-PROTECTED MOSFET AUTOMOTIVE 'Q' PORTFOLIO

SELF-PROTECTED MOSFET (IntelliFET™)

Diodes incorporated designs, develops, and manufactures a range of high-side and low-side self-protected MOSFETs that are ideal for driving inductive loads such as motors, relays, and lamps at low frequencies.

These devices feature overtemperature, overvoltage, and overcurrent protection as well as input ESD protection facilities enabling circuit designers to dramatically increase reliability.

The Diodes IntelliFET portfolio is packaged in the SOT23F, SOT223, SM8, SO-8, and TO252-5 packages.



Moving to the ZXMS6004FF reduces the board area by a factor of 6.5 yet maintains functionality and power dissipation.

THE DIODES™ ADVANTAGE

- **Overvoltage, Overtemperature, and Overcurrent Protection**
Improved robustness and reliability for harsh environments
- **Typical $R_{DS(ON)}$ as Low as 80mΩ**
Low $R_{DS(ON)}$ minimizes the conduction losses through the device
- **3V and 5.5V Inputs**
IntelliFET portfolio can be driven directly from a microcontroller
- **AEC-Q101**
Qualified to AEC-Q101 to ensure high reliability
- **PPAP**
Production Part Approval Process documents are provided

LOW-SIDE SELF-PROTECTED MOSFET (IntelliFET)

Part Number	Configuration	V_{DS} (V)	I_D (A)	P_D (W)	$R_{DS(on)}$ max (mΩ) @ V_{IN}			V_{DS} (S/C) $V_{IN} = 5V$	E_{AS} (mJ)	Package	Availability
					3V	5V	10V				
ZXMS6006DGQ	Single	60	2.8	3	0.1	0.125	-	16	490	SOT223	Released
ZXMS6006SGQ	Single	60	2.8	3	0.1	0.125	-	16	490	SOT223	Released
ZXMS6006DT8Q	Dual	60	-	2.1	0.1	0.125	-	16	210	SM-8	Released
ZXMS6005DGQ	Single	60	2	1.6	0.25	0.2	-	24	490	SOT223	Released
ZXMS6005SGQ	Single	60	2	1.6	0.25	0.2	-	24	490	SOT223	Released
ZXMS6005DT8Q	Dual	60	1.8	1.6	0.25	0.2	-	24	210	SM-8	Released
ZXMS6005N8Q	Single	60	6	1.6	0.25	0.2	-	24	210	SO8	Released
ZXMS6005DN8Q	Dual	60	6	1.6	0.25	0.2	-	24	210	SO8	Released
ZXMS6004SGQ	Single	60	1.3	1.6	0.6	0.5	-	36	480	SOT223	Released
ZXMS6004DGQ	Single	60	1.3	3	0.6	0.5	-	36	490	SOT223	Released
ZXMS6004FFQ	Single	60	1.3	1.5	0.6	0.5	-	36	90	SOT23F	Released
ZXMS6004N8Q	Single	60	1.3	1.3	0.6	0.5	-	36	120	SO8	Released
ZXMS6004DN8Q	Dual	60	1.3	1.3	0.6	0.5	-	36	120	SO8	Released
ZXMS6004DT8Q	Single	60	1.2	2.3	0.6	0.5	-	36	210	SM-8	Released
BSP75CQ	Single	60	1.4	2.5	-	0.675	0.55	36	550	SOT223	Released
BSP75NQ	Single	60	1.2	1.5	-	0.675	0.55	36	550	SOT223	Released
ZXMS6008FFQ	Single	60	1.1	1.5	0.8	0.7	-	36	90	SOT23F	Released

HIGH-SIDE SELF-PROTECTED MOSFET (IntelliFET)

Part Number	Channel	V_S (V)	V_S (S/C)	$I_{L(NOM)}$ (A)	$R_{(DS(on))}$ typ @25°C	$R_{(DS(on))}$ max @150°C	E_{AS} (mJ)	Package	Expected Availability
ZXMS81045SPQ	Single	41	24	4.0	34	90	40	SOP8	Released
ZXMS81090SPQ	Single	41	24	3.0	90	180	50	SOP8	Q4 2022
ZXMS81200SPQ	Single	41	24	2.0	180	360	70	SOP8	Q4 2022
ZXMS82090S14PQ	Dual	41	24	4.5	90	180	42	SOP14	Q1 2023
ZXMS82120S14PQ	Dual	41	24	2.5	120	240	28	SOP14	Q1 2023
ZXMS82180S14PQ	Dual	41	24	2.5	180	360	28	SOP14	Q1 2023

IntelliFET is a trademark of Diodes Incorporated in the United States and other countries

BIPOLAR TRANSISTORS AUTOMOTIVE 'Q' PORTFOLIO

THE DIODES™ ADVANTAGE

- Broad Portfolio**
 NPN, PNP, Darlington, Matched Pairs, Pre-Biased Transistors, Gate Drivers meet the majority of customer needs.
- Low $V_{CE(sat)}$**
 Leading-edge silicon technology gives best-in-class saturation voltage performance with respect to footprint.
- High Peak Current**
 For gate driving, high peak current handling allows the capacitive load of MOSFET and IGBT gates to be switched quickly.
- High Gain**
 High minimum gains help reduce the base current requirements and assist in switching faster.
- AEC-Q101**
 High-reliability qualification meet the demands of the automotive industry
- PPAP Supported**
 Production Part Approval Process documents provided



Part Number	Product Type	V_{CEO} , V_{CES} (V)	I_C (A)	I_{CM} (A)	P_D (A)	Min	h_{FE}			$V_{CE(sat)}$				ft	$R_{CE(sat)}$ (mΩ)	Package
							@ I_C (A)	Min 2	@ I_C 2 (A)	Max (mV)	@ I_C/I_B (A/mA)	Max 2 (mV)	@ I_C/I_B 2 (A/mA)			
BCX6825Q	NPN	20	1	2	1	160	0.5	-	-	500	1/100	-	-	100	-	SOT89
DSS5220TQ	PNP	20	2	3	1.2	225	0.1	225	0.5	80	0.5/50	150	1/50	100	113	SOT23
ZXT10P20DE6Q	PNP	20	2.5	6	1.1	300	0.1	150	2	220	1/20	250	1.5/50	150	-	SOT26
ZXTC6718MCQ	NPN + PNP	20	4.5,3.5	12, 6	1.5	300	0.2,0.1	200,150	2	150, 220	1/10,1/20	135,250	2/50, 1.5/50	100, 150	47, 64	W-DFN3020-8 (Type B)
ZXTN19020DZQ	NPN	20	7.5	20	2.4	300	0.1	150	7.5	70	1/10	100	7/700	160	21	SOT89
ZXTP56020FDBQ	PNP + PNP	20	2	3	2.47	250	0.1	210	0.5	110	0.05/50	220	1/50	-	220	U-DFN2020-6 (SWP) (Type A)
ZXTN2005ZQ	NPN	25	5.5	20	2.1	300	1	200	7	45	1/100	200	6.5/150	150	-	SOT89
DXTP07025BFGQ	PNP	25	3	8	2.3	100	1	75	2	200	1/100	400	3/300	160	-	PowerDI3333-8 (SWP)
FZT789Q	PNP	25	3	6	2	250	1	200	2	250	0.5/50	450	-	100	93	SOT223
ZXTP2008ZQ	PNP	30	5.5	20	2.1	100	1	70	5	80	1/20	80	2/200	110	-	SOT89
FZT749Q	PNP	25	3	8	2	100	1	75	2	300	1/100	600	3/300	160	-	SOT223
FZT789AQ	PNP	25	3	6	2	300	0.01	100	6	250	1/10	450	2/20	100	93	SOT223
FZT489Q	NPN	30	1	4	2	100	1	60	2	300	1/1	600	-	150	-	SOT223
DXTN22040CFGQ	NPN	40	2	3	2.3	200	0.5	80	2	120	0.5/50	350	2/200	200	-	PowerDI3333-8 (SWP)
DXTN22040DFGQ	NPN	40	2	3	2.3	300	0.5	140	2	120	0.5/50	350	2/200	198	-	PowerDI3333-8 (SWP)
DXTP22040CFGQ	PNP	40	2	3	2.3	200	0.5	80	2	130	0.5/50	350	2/200	120	65	PowerDI3333-8 (SWP)
DXTP22040DFGQ	PNP	40	2	3	2.3	300	0.5	120	2	170	0.5/50	400	2/200	120	73	PowerDI3333-8 (SWP)
DXTP07040CFGQ	PNP	40	3	6	0.9	100	0.5	80	1	250	0.5/5	400	1/10	100	-	PowerDI3333-8 (SWP)
FCX591AQ	PNP	40	1	2	1	250	0.5	160	1	200	0.1/1	500	1/100	150	-	SOT89
ZXTP19040CCQ	PNP	40	3	5	2	220	0.5	100	3	150	0.5/5	500	3/03	150	-	SOT223
ZXTP2009ZQ	PNP	40	5.5	15	2.1	200	0.5	110	5.5	165	1/100	175	2/200	152	-	SOT89
FZT949Q	PNP	30	5.5	20	3	100	0.01	75	5	75	0.5/20	270	2/200	100	-	SOT223
FZT491AQ	NPN	40	1	2	2	300	0.5	200	1	300	0.5/50	500	1/100	150	-	SOT223
FZT591AQ	PNP	40	1	2	2	250	0.5	160	1	200	0.1/1	500	1/100	150	-	SOT223
FZT690BQ	NPN	45	3	6	2	400	1	150	2	100	0.5/50	500	1/100	150	-	SOT223
DSS5160TQ	PNP	60	1	3	0.725	200	0.001	100	1	175	0.1/1	340	1/100	150	340	SOT23
DXTP07060BFGQ	PNP	60	3	6	2.3	100	0.5	40	2	250	1/100	500	3/300	140	-	PowerDI3333-8 (SWP)
DXT651Q	NPN	60	3	6	1	100	0.5	40	2	300	1/100	600	3/300	200	-	SOT89
DXT751Q	PNP	60	3	6	1	100	0.5	40	2	300	1/100	600	3/300	100	-	SOT89
DXTN3C60PSQ	NPN	60	3	8	5	200	1	50	3	120	1/50	270	3/300	140	90	PowerDI5060-8

BIPOLAR TRANSISTORS AUTOMOTIVE 'Q' PORTFOLIO (CONT)

Part Number	Product Type	V _{CEO} , V _{CES} (V)	I _C (A)	I _{CM} (A)	P _D (A)	h _{FE}				Max (mV)	V _{CE(sat)}			ft	R _{CE(sat)} (mΩ)	Package
						Min	@I _C (A)	Min 2	@I _{C2} (A)		@ I _C /I _B (A/mA)	Max 2 (mV)	@ I _C /I _{B2} (A/mA)			
DXTP3C60PSQ	PNP	60	3	8	5	150	1	35	3	225	1/50	360	3/300	100	120	PowerDI5060-8
FMMT38CQ	NPN	60	0.3	0.8	0.33	10000	0.5	-	-	-	0.8/8	-	-	-	-	SOT23
FMMT491Q	NPN	60	1	2	0.5	100	0.5	80	1	150	0.5/50	250	1/100	-	-	SOT23
FMMT591Q	PNP	60	1	2	0.5	100	0.5	80	1	180	-	350	1/100	-	-	SOT23
ZXT690BKQ	NPN	45	3	6	3.4	400	1	60	3	360	1/5	320	2/40	150	77	TO252 (DPAK)
FZT651Q	NPN	60	-	6	2	100	0.5	40	2	300	1/100	600	3/500	-	-	SOT223
FZT751Q	PNP	60	3	6	2	100	-	40	-	300	1/100	600	3/300	-	-	SOT223
DXTNI0060DFJBQ	NPN	60	4	6	1.8	340	0.2	140	2	20	0.1/10	200	2/50	125	60	DFN2020-3
DXTNI0060DFJBWQ	NPN	60	4	6	1.8	340	0.2	140	2	20	0.1/10	200	2/50	125	60	DFN2020-3 (SWP)
ZXTN2018FQ	NPN	60	5	12	1.2	100	2	40	5	55	1/50	170	4/400	130	-	SOT23
ZXTN25060BZQ	NPN	60	5	10	1.8	90	1	-	2	90	1/50	230	4/400	-	-	SOT89
ZXTP56060FDBQ	PNP + PNP	60	2	3	2.47	170	0.1	140	0.5	120	0.5/50	250	1/50	-	250	U-DFN2020-6 (SWP) (Type A)
FZT951Q	PNP	60	5	15	3	100	0.01	75	5	50	3.375	210	-	120	-	SOT223
FZT591Q	PNP	60	1	2	2	100	0.5	15	2	300	1/100	600	2/200	150	-	SOT223
ZXT951KQ	PNP	65	6	15	3.2	100	2	15	10	90	1/100	400	6/600	120	-	TO252 (DPAK)
FZT851Q	NPN	60	6	20	3	100	0.01	75	5	100	1/50	170	2/50	130	-	SOT223
ZXT951KQ	PNP	65	6	15	4.2	100	2	50	6	90	1/100	165	2/200	120	53	TO252 (DPAK)
FZT692BQ	NPN	70	2	5	2	400	0.5	150	1	500	0.1/5	500	2/50	150	-	SOT223
FCX1053AQ	NPN	75	3	10	1	300	0.5	40	4.5	200	1/10	210	2/100	140	-	SOT89
ZXTI053AKQ	NPN	75	5	10	3.4	300	1	50	5	30	0.2/20	160	1/10	140	70	TO252 (DPAK)
BCP5316Q	PNP	80	1	2	2	100	0.15	25	0.5	500	0.5/50	-	-	150	-	SOT223
BCP5610Q	NPN	80	1	2	2	63	0.15	25	0.5	500	0.5/50	-	-	150	-	SOT223
BCP5616Q	NPN	80	1	2	2	100	0.15	25	0.5	500	.5/50	-	-	150	-	SOT223
BCX5316Q	PNP	80	1	1.5	1	100	0.15	25	0.5	500	0.5/50	-	-	150	-	SOT89
BCX5616Q	NPN	80	1	1.5	1	100	0.15	25	0.5	500	0.5/50	-	-	150	-	SOT89
FZTI053AQ	NPN	75	4.5	10	3	300	1	40	4.5	200	1/10	440	4.5/200	140	78	SOT223
DXTP06080BFGQ	PNP	80	1	2	2.3	100	0.15	40	0.5	280	0.5/50	500	0.8/70	150	-	PowerDI3333-8 (SWP)
FZT603Q	NPN	80	2	6	2	3000	1	-	-	1000	1/1	-	-	150	-	SOT223
DXTN3C100PSQ	NPN	100	3	8	5	80	1	20	2	150	1/50	330	3/300	140	90	PowerDI5060-8
DXTP3C100PSQ	PNP	100	3	8	5	160	1	45	2	110	0.5/0.5	360	2/200	125	110	PowerDI5060-8
DXTPO7100BFGQ	PNP	100	2	6	2.3	100	0.5	55	1	250	1/100	500	2/200	140	-	PowerDI3333-8 (SWP)
FZT653Q	NPN	100	2	6	2	100	0.5	25	2	300	1/100	500	2/200	140	-	SOT223
MJD31CUQ	NPN	100	3	5	2.1	25	1	10	3	1200	3.375	-	-	3	-	TO252 (DPAK)
MJD32CUQ	PNP	100	3	5	2.1	25	1	10	3	1200	3.375	-	-	3	-	TO252 (DPAK)
FZT753Q	PNP	100	2	6	2	100	0.5	55	1	300	0.1/10	500	2/200	100	-	SOT223
FZT953Q	PNP	100	5	10	3	100	0.01	50	5	50	3/375	220	-	125	-	SOT223
FMMT494Q	NPN	120	1	2	0.5	100	0.25	20	1	200	0.25/25	300	0.5/50	100	-	SOT23 (Type DN)
FZT705Q	PNP	120	2	4	2	3000	0.1	2000	2	1300	1/1	2500	2/2	160	-	SOT223
ZXTP25140BFHQ	PNP	140	1	3	1.25	100	0.01	100	0.1	135	0.1/2	230	0.5/25	75	-	SOT23
FZT795AQ	PNP	140	0.5	1	2	300	0.01	100	0.3	300	0.1/1	300	0.2/5	100	-	SOT223
FZT600QB	NPN	140	2	4	2	10000	0.5	5000	1	1100	0.5/5	1200	1/10	250	-	SOT223
ZXTN4004KQ	NPN	150	1	3	3.4	60	0.085	100	0.15	250	0.1/5	-	-	-	-	TO252 (DPAK)
FCX495Q	NPN	150	1	2	1	100	100	50	0.5	200	0.15/15	300	-	100	-	SOT89
DXT5551P5Q	NPN	160	0.6	-	2.25	80	0.01	30	0.05	150	0.01/1	200	0.05/5	130	-	PowerDI5
DZT5551Q	NPN	160	0.6	1	2	80	0.01	30	0.05	150	0.1/1	200	0.05/5	100	-	SOT223
FZT956Q	PNP	200	2	5	3	100	0.01	75	3	60	0.15/15	150	0.5/50	110	-	SOT223
DZTA42Q	NPN	300	0.5	-	1	40	0.01	40	0.03	500	0.02/2	-	-	50	-	SOT223
FZT857Q	NPN	300	3.5	5	3	100	0.01	15	2	100	0.5/50	-	-	-	-	SOT223
FMMTA92Q	PNP	300	0.2	-	0.33	40	0.01	25	0.03	500	0.1/10	-	1.25/100	50	-	SOT23
FZT657Q	NPN	300	0.5	1	2	40	0.01	50	0.1	500	0.1/10	N/A	N/A	30	-	SOT223
FZT957Q	PNP	300	1	2	3	100	0.01	90	1	100	0.1/10	165	0.5/100	85	-	SOT223
FZT458Q	NPN	400	0.3	1	2	100	0.001	15	0.1	200	0.02/2	500	0.05/6	50	-	SOT223
FCX558Q	PNP	400	0.2	0.5	1	10	0.05	15	0.1	200	0.02/2	500	0.05/6	50	-	SOT89
FMMT459Q	NPN	450	0.15	0.5	0.625	50	0.03	-	-	75	0.02/2	90	0.05/6	-	-	SOT23
FMMT560Q	PNP	500	0.15	0.5	0.625	100	0.001	80	0.05	200	0.02/2	500	0.05/10	-	-	SOT23
ZXTP01500BCQ	PNP	500	0.15	0.5	2	100	0.001	80	0.05	200	1/100	500	5/500	60	-	SOT223
DXTNI0060DFJBQ	NPN	60	4	6	1.8	340	0.2	140	2	20	0.1/10	200	2/50	125	60	DFN2020-3
DXTNI0060DFJBWQ	NPN	60	4	6	1.8	340	0.2	140	2	20	0.1/10	200	2/50	125	60	DFN2020-3 (SWP)

SUPER BARRIER RECTIFIER AUTOMOTIVE 'Q' PORTFOLIO

Super Barrier Rectifier (SBR) is a Diodes Incorporated proprietary rectifier technology that combines the low reverse leakage (I_R) and fast-switching characteristics (T_{RR}) of ultrafast rectifiers with the low forward voltage drop (V_F) of Schottky diodes.

Furthermore, SBR has a proven, best-in-class repetitive avalanche rating, high-temperature stability, and wide safe operating area (SOA) that improves the reliability of the end application.

These characteristics make SBRs ideal for use as a reverse battery blocking or freewheel diode in automotive applications.



THE DIODES™ ADVANTAGE

- Avalanche Rated**
 Reverse avalanche capability that is up to 10 times greater than competing solutions; 100% avalanche tested, ensuring more rugged and reliable end applications
- Low Reverse Leakage Current (I_R)**
 Low reverse leakage (I_R) at high temperatures provides increased reliability against thermal runaway
- Low Forward Voltage (V_F)**
 The lower SBR forward voltage drop ensures power dissipation is minimized
- Qualified to AEC-Q101**
 Proven reliability for harsh automotive environment
- PPAP Supported**
 Production Part Approval Process documents provided

COMPARISON OF SBR AGAINST OTHER DIODE TECHNOLOGIES

Part Number	Forward Voltage	Leakage Current	Junction Temp	Reverse Recovery	Reverse Avalanche
	V_F	I_R	T_J	T_{RR}	
Ultra-Fast Rectifiers	⊗ High V_F	⊙ Low I_R	⊙ $T_J < 175^\circ\text{C}$	⊙ Fast	⊗ Low
Standard Rectifiers	⊗ High V_F	⊙ Low I_R	⊙ $T_J < 175^\circ\text{C}$	⊗ Slow	⊗ Low
Schottky	⊙ Low V_F	⊗ High I_R	⊙ $T_J < 150^\circ\text{C}$	⊙ Fast	⊗ Low
SBR	⊙ Low V_F	⊙ Low I_R	⊙ $T_J < 200^\circ\text{C}$	⊙ Fast	⊙ V High
Trench SBR	⊙ Ultra Low V_F	⊙ Ultra Low I_R	⊙ $T_J < 200^\circ\text{C}$	⊙ Fast	⊙ High

SBR® is a registered trademark of Diodes Incorporated

SUPER BARRIER RECTIFIER AUTOMOTIVE 'Q' PORTFOLIO

Part Number	Configuration	V _{RRM} (V)	I _F (A)	I _{FSM} (A)	V _F Max (V)	I _R Max (mA)	C _T (typ)	E _{AS} (mJ)	T _J (°C)	Package	Availability
SBRT05U20LPQ	Single	20	0.5	10	0.39	0.05	-	-	150	DFN1006	Released
SBRT05U20S3Q	Single	20	0.5	10	0.52	0.2	10	-	150	SOD323	Released
SBR8U20SP5Q	Single	20	8	180	0.51	0.3	360	146	150	PowerDI5	Released
SBRI5U30SP5Q	Single	30	15	200	0.49	0.5	500	1074	150	PowerDI5	Released
SBRIA40S3Q	Single	40	1	20	0.55	0.5	55	-	150	SOD323	Released
SBRI40S1FQ	Single	40	1	30	0.51	0.1	50	-	150	SOD123F	Released
SBR2A40PIQ	Single	40	2	50	0.5	0.1	60	-	150	PowerDI123	Released
SBRT3U40PIQ	Single	40	3	50	0.49	0.18	45	-	150	PowerDI123	Released
SBR3U40S1FQ	Single	40	3	90	0.49	0.1	80	-	150	SOD123F	Released
SBR3A40SAQ	Single	40	3	45	0.5	0.4	70	-	150	SMA	Released
SBR3U40PIQ	Single	40	3	75	0.47	0.4	70	-	150	PowerDI123	Released
SBR545SAFQ	Single	40	5	100	0.56	0.2	-	-	150	SMAF	Released
SBRI045DIQ	Single	45	10	90	0.58	0.3	280	200	150	TO252 (DPAK)	Released
SBRI0U45DIQ	Single	45	10	125	0.57	0.3	550	620	150	TO252 (DPAK)	Released
SBRI045SP5Q	Single	45	10	180	0.53	0.4	220	-	150	PowerDI5	Released
SBRI0A45SP5Q	Single	45	10	45	0.53	0.4	45	-	150	PowerDI5	Released
SBRI045CTLQ	Dual	45	10	90	0.55	0.3	120	100	150	TO252 (DPAK)	Released
SBRI0U45SP5Q	Single	45	10	125	0.47	0.3	600	530	150	PowerDI5	Released
SBR20M45DIQ	Single	45	20	140	0.61	0.1	650	-	175	TO252 (DPAK)	Released
SBR30A45CTBQ	Dual	45	30	175	0.55	0.55	500	135	150	TO263AB (D2PAK)	Released
SBR3045CTBQ	Dual	45	30	180	0.7	0.5	-	-	150	TO263AB (D2PAK)	Released
SBRT20U50SLPQ	Single	50	20	200	0.5	0.5	350	-	150	PowerDI5060	Released
SBR0560SIQ	Single	60	0.5	15	0.5	0.1	-	-	150	SOD123	Released
SBRFP2M60PIQ	Single	60	2	50	0.53	12	TBC	TBC	150	PowerDI123	Q4 2022
SBR2M60S1FQ	Single	60	2	30	0.7	0.0008	70	-	175	SOD123F	Released
SBR2U60S1FQ	Single	60	2	35	0.51	0.15	75	-	175	SOD123F	Released
SBR3U60PIQ	Single	60	3	80	0.6	0.06	60	120	175	PowerDI5	Released
SBR3U60P5Q	Single	60	3	80	0.6	0.06	35	110	175	PowerDI6	Released
SBR5U60P5Q	Single	60	5	160	0.69	0.15	200	-	150	PowerDI5	Q4 2022
SBR660CTLQ	Dual	60	6	80	0.57	0.3	116	130	150	TO252 (DPAK)	Released
SBR8U60P5Q	Single	60	8	280	0.53	0.33	40	620	150	PowerDI5	Released
SBRTI0U60DIQ	Single	60	10	140	0.52	0.4	390	-	150	TO252 (DPAK)	Released
SBR20A60CTBQ	Dual	60	20	150	0.79	0.5	400	500	150	TO263AB (D2PAK)	Released
SBR30A60CTBQ	Dual	60	30	180	0.63	0.33	-	600	150	TO263AB (D2PAK)	Released
SBRO2U100LPQ	Single	100	0.25	5	0.8	1	-	-	150	X1-DFN1006-2	Released
SBR6100CTLQ	Dual	100	6	78	0.74	0.1	80	120	150	TO252 (DPAK)	Released
SBR6M100P5Q	Single	100	6	TBC	0.88	0.002	245	350	150	PowerDI5	Q4 2022
SBR8M100P5Q	Single	100	8	130	0.88	0.002	245	350	175	PowerDI5	Released
SBRI0M100P5Q	Single	100	10	220	0.88	0.002	245	-	175	PowerDI5	Released
SBRI2U100P5Q	Single	100	12	250	0.78	0.25	200	592	150	PowerDI5	Released
SBRI5U100CTLQ	Dual	100	15	100	0.8	0.1	150	192	150	TO252 (DPAK)	Released
SBRIU150SAQ	Single	150	1	42	0.7	0.1	10	-	150	SMA	Released
SBR20M150DIQ	Single	150	20	160	0.9	0.05	170	-	175	TO252 (DPAK)	Released
SBRIU200PIQ	Single	200	1	40	0.82	1	25	20	150	PowerDI123	Released
SBRI0U200P5Q	Single	200	10	180	0.88	0.1	200	-	150	PowerDI5	Released
SBR40U200CTBQ	Dual	200	40	280	0.93	0.2	500	-	175	TO263AB (D2PAK)	Released

SCHOTTKY DIODES AUTOMOTIVE 'Q' PORTFOLIO

The PowerDI123 and PowerDI5 packages feature a proprietary clip die attach that improves IFSM and reliability.

Furthermore, both the PowerDI5 and PowerDI123 feature off-board profiles of just 1.1mm and 1mm respectively, providing designers with a high-density, low-profile Schottky portfolio.



THE DIODES™ ADVANTAGE

- Small Form Factor Packages**
 PowerDI5 occupies just 26mm², 55% smaller than DPAK
 PowerDI123 PCB footprint is just 7.5mm², 60% smaller than SMA package
- Low Forward Voltage (V_F)**
 Diodes' schottky portfolio features low forward voltage that minimizes conduction losses, reducing power dissipation
- AEC-Q101**
 High-reliability qualification in association with AEC-Q101
- PPAP Supported**
 Production Part Approval Process documents provided

Part Number	Configuration	V _{RRM} (V)	I _F (A)	I _{FSM} (A)	V _F Max (V)	I _R Max (mA)	C _T Typ	T _J (°C)	Package	Availability
BAS70-06Q	Dual, Com. Anode	70	0.001	0.1	0.41	0.0001	1.6	125	SOT23	Released
BAS70-05Q	Dual, Com. Cath	70	0.001	0.1	0.41	0.0001	1.6	125	SOT23	Released
BAS70-04Q	Dual, Series	70	0.001	0.1	0.41	0.0001	1.6	125	SOT23	Released
BAS70Q	Single	70	0.001	0.1	0.41	0.0001	1.6	125	SOT23	Released
SDM03U40Q	Single	40	0.03	0.2	0.37	0.0005	2	125	SOD523	Released
BAS70DW-05Q	Dual-Dual, Com. Cath	70	0.07	0.1	0.41	0.0001	1.8	125	SOT363	Released
BAS70TWQ	Triple, Isolated	70	0.07	0.1	0.41	0.0001	1.8	125	SOT363	Released
BAS70WQ	Single	70	0.07	0.1	0.41	0.0001	1.8	125	SOT323	Released
BAS70W-04Q	Dual, Series	70	0.07	0.1	0.41	0.0001	1.8	125	SOT323	Released
BAS70W-05Q	Dual, Com. Cath	70	0.07	0.1	0.41	0.0001	1.8	125	SOT323	Released
BAS70W-06Q	Dual, Com. Anode	70	0.07	0.1	0.41	0.0001	1.8	125	SOT323	Released
BAS70DW-04Q	Dual-Dual, Series (Alt.)	201	0.07	0.1	0.41	0.0001	1.8	125	SOT363	Released
BATS4WSQ	Single	30	0.1	0.6	1	0.002	8	150	SOD323	Released
BAT46WQ	Single	100	0.15	0.75	1	0.002	20	125	SOD123	Released
BATS4SQ	Dual, Series	30	0.2	0.6	0.8	0.002	8	150	SOT23	Released
BATS4CQ	Dual, Com. Cath	30	0.2	0.6	0.8	0.002	8	150	SOT23	Released
BATS4AQ	Dual, Com. Anode	30	0.2	0.6	0.8	0.002	8	150	SOT23	Released
BATS4Q	Single	30	0.2	0.6	0.8	0.002	8	150	SOT23	Released
BATS4CWQ	Dual, Com. Cath	30	0.2	0.6	0.32	0.002	8	125	SOT323	Released
BATS4SWQ	Dual, Series	30	0.2	0.6	0.32	0.002	8	125	SOT323	Released
BATS4AWQ	Dual, Com. Anode	30	0.2	0.6	0.32	0.002	8	125	SOT323	Released
BATS4WQ	Single	30	0.2	0.6	0.32	0.002	8	125	SOT323	Released
BATS4SDWQ	Dual-Dual, Series (Alt.)	30	0.2	0.6	1	0.002	8	125	SOT363	Released
BATS4TWQ	Triple, Isolated	30	0.2	0.6	1	0.002	8	125	SOT363	Released
SDM20U30LPQ	Single	30	0.2	1	0.575	0.15	20	125	X1-DFN1006-2	Released
BAT54TQ	Single	30	0.2	0.6	1	0.002	8	150	SOT523	Released
BATS4STQ	Dual, Series	30	0.2	0.6	1	0.002	8	150	SOT523	Released
SDM20U30Q	Single	30	0.2	1	0.5	0.15	20	125	SOD523	Released
BATS4LPQ	Single	30	0.2	0.6	1	0.002	8	125	X1-DFN1006-2	Released
BAS40TWQ	Triple, Isolated	40	0.2	0.6	1	0.0002	3	125	SOT363	Released
BAS40Q	Single	40	0.2	0.6	1	0.0002	4	125	SOT23	Released
BAS40-04Q	Dual, Series	40	0.2	0.6	1	0.0002	4	125	SOT23	Released
BAS40-05Q	Dual, Com. Cath	40	0.2	0.6	1	0.0002	4	125	SOT23	Released

SCHOTTKY DIODES AUTOMOTIVE 'Q' PORTFOLIO (CONT)

Part Number	Configuration	V _{RRM} (V)	I _F (A)	I _{FSM} (A)	V _F Max (V)	I _R Max (mA)	C _T Typ	T _J (°C)	Package	Availability
BAS40-06Q	Dual, Com. Anode	40	0.2	0.6	1	0.0002	4	125	SOT23	Released
BAS40LPQ	Single	40	0.2	1	1	0.0002	2.3	150	X1-DFN1006-2	Released
SDM20U40Q	Single	40	0.25	1	0.6	0.005	50	125	SOD523	Released
BAT64T5Q	Single	40	0.25	1.2	0.725	0.002	6	150	SOD523	Released
SDI03BWSQ	Single	40	0.35	1.5	0.37	0.005	35	125	SOD323	Released
SDI03AWSQ	Single	40	0.35	1.5	0.37	0.005	35	125	SOD323	Released
SDM40E20LSQ	Dual, Series	20	0.4	2	0.43	0.25	120	125	SOT23	Released
SDM40E20LAQ	Dual, Series	20	0.4	2	0.43	0.25	120	125	SOT23	Released
ZHCS400QTA	Single	40	0.4	3	0.5	0.04	20	150	SOD323	Released
B0520LWQ	Single	20	0.5	5.5	0.385	0.25	100	125	SOD123	Released
B0530WSQ	Single	30	0.5	2	0.45	0.5	58	125	SOD323	Released
ZHCS500Q	Single	40	0.5	12	0.55	0.04	20	150	SOT23	Released
B0540WQ	Single	40	0.5	5.5	0.62	0.02	100	150	SOD123	Released
ZHCS506QTA	Single	60	0.5	2.5	0.63	0.04	20	150	SOT23	Released
ZLLS400QTA	Single	40	0.52	2.5	0.5	0.01	15	150	SOD323	Released
ZHCS750QTA	Single	40	0.75	5.2	0.49	0.1	25	150	SOT23	Released
ZLLS500QTA	N/A	40	0.75	3.2	0.63	0.01	16	150	SOT23	Released
PD3S120LQ	Single	20	1	33	0.42	0.16	200	150	PowerDI323	Released
DFLS120LQ	Single	20	1	22	0.36	1	75	150	PowerDI123	Released
BAT760Q	Single	30	1	5.5	0.55	0.01	25	150	SOD323	Released
PD3S130HQ	Single	30	1	22	0.45	0.1	200	150	PowerDI323	Released
PD3S130LQ	Single	30	1	22	0.42	1.5	150	150	PowerDI323	Released
DFLS130LQ	Single	30	1	33	0.36	1	75	150	PowerDI123	Released
ZHCS1000Q	Single	40	1	12	0.5	0.05	25	150	SOT23	Released
ZLLS1000Q	Single	40	1	12	0.56	0.02	30	150	SOT23	Released
BAT1000Q	Single	40	1	5.5	0.5	0.1	50	150	SOT23	Released
DFLS140Q	Single	40	1	40	0.55	0.01	28	150	PowerDI123	Released
DFLS140LQ	Single	40	1	50	0.51	0.1	90	150	PowerDI123	Released
PD3S140Q	Single	40	1	22	0.42	1.5	150	150	PowerDI323	Released
ZHCS1000QTA	Single	40	1	5.2	0.5	0.1	25	125	SOT23	Released
1N5819HWQ	Single	40	1	25	0.45	0.05	50	125	SOD123	Released
SDM160S1FQ	Single	60	1	50	0.53	0.06	50	175	SOD123F	Released
DFLS160Q	Single	60	1	50	0.5	0.1	67	150	PowerDI123	Released
PD3S1360Q	Single	60	1	22	0.64	0.05	40	150	PowerDI323	Released
PD3S160Q	Single	60	1	22	0.64	0.05	38	150	PowerDI5	Released
DFLS1100Q	Single	100	1	40	0.77	2	28	150	PowerDI123	Released
SDM1U100S1FQ	Single	100	1	40	0.77	0.15	-	150	SOD123F	Released
DFLS1150Q	Single	150	1	50	0.82	0.002	28	175	PowerDI5	Released
DFLS1200Q	Single	200	1	40	0.85	2	23	150	PowerDI123	Released
PD3S220LQ	Single	20	2	33	0.49	0.16	46	125	PowerDI323	Released
PD3S230LQ	Single	30	2	30	0.45	1.4	150	150	PowerDI323	Released
DFLS230Q	Single	30	2	22	0.49	1	75	150	PowerDI123	Released
DFLS230LQ	Single	30	2	33	0.42	1	76	150	PowerDI123	Released
PD3S230HQ	Single	30	2	30	0.6	0.1	40	150	PDI323	Released
DFLS240LQ	Single	40	2	50	0.5	1	90	150	PowerDI123	Released
DFLS240Q	Single	40	2	40	0.7	0.02	28	125	PowerDI123	Released
ZLLS2000Q	Single	40	2	12	0.54	0.04	65	150	SOT26	Released
DFLS260Q	Single	60	2	50	0.62	1	67	150	PowerDI123	Released
SDM2100S1FQ	Single	100	2	50	0.83	0.15	-	150	SOD123F	Released
DFLS2100Q	Single	100	2	50	0.86	0.001	36	175	PowerDI123	Released
PDS340Q	Single	40	3	90	0.49	0.5	490	150	PowerDI5	Released
PDS360Q	Single	60	3	100	0.62	0.15	380	150	PowerDI5	Released
PDS3100Q	Single	100	3	90	0.76	0.1	260	150	PowerDI5	Released
PDS3200Q	Single	200	3	180	0.78	0.1	520	150	PowerDI5	Released
PDS4150Q	Single	150	4	180	0.76	0.01	530	150	PowerDI5	Released
PDS4200HQ	Single	200	4	180	0.78	0.1	520	150	PowerDI5	Released
B140HWQ	Single	200	4	180	0.78	0.1	520	125	SOD123	Released
PDS540Q	Single	40	5	100	0.52	0.25	700	150	PowerDI5	Released
ZHCS506Q	Single	60	5	5.5	0.63	0.04	20	150	SOT23	Released
PDS560Q	Single	60	5	150	0.67	0.15	500	150	PowerDI5	Released
PDS5100Q	Single	100	5	250	0.78	0.2	310	150	PowerDI5	Released
PDS5100HQ	Single	100	5	250	0.71	0.0035	700	150	PowerDI5	Released
PDS760Q	Single	60	7	275	0.62	0.2	1050	150	PowerDI5	Released
PDS1040Q	Single	40	10	275	0.49	0.7	1000	150	PowerDI5	Released

POWER PROTECTION TVS AUTOMOTIVE 'Q' PORTFOLIO

THE DIODES™ ADVANTAGE

- Qualified to AEC-Q100 in IATF16949 Certified Facilities
- PPAP Supported
Production Part Approval Process documents provided
- IEC Compliant
IEC61000-4-2 and 6100-4-5 compliant against electrostatic discharge
- Small Form Factor Package



Part Number	Configuration	V _{RWM} (V)	V _{BR} (V)	I _R (mA)	I _{PP} (A)	V _{CLAMP@I_{PP}} (V)	P _{PK} (W)	Package	Availability
DTVS3V3 - DTVS36SP4URQ	Unidirectional	3.3 - 36	5.2 - 40.0	<0.3	43.8 - 6.9	8 - 58.1	225	SOD123F	Q4 22
DFLT5V0 - DFLT40AQ	Unidirectional	5 - 40	6.4 - 49.1	<0.4	24.5 - 3.5	9.2 - 64.5	225	SOD123F	Released
SMFL5.0 - SMFL200(C)AQ	Uni/Bidirectional	6.4 - 224	6.4 - 248	<1	43.5 - 1.2	9.2 - 324	400	DO219AA	Released
SMA5.0 - SMAJ200AQ	Single Unidirectional	5 - 200	6.4 - 248	<1	43.5 - 1.2	9.2 - 324	400	SMA	Released
P4SMAJ5.0 - P4SMAJ85ADFQ	Unidirectional	5 - 85	6.4 - 104	<0.1	43.5 - 2.9	9.2 - 137	400	DFlat	Released
SMAJ5.0 - SMAJ200CAQ	Single Bidirectional	5 - 200	6.4 - 248	<1	43.5 - 1.2	9.2 - 324	400	SMA	Released
SMA6J5.0 - SMAJ188AQ	Uni/Bidirectional	5 - 188	6.4 - 248	<0.1	65.2 - 1.8	9.2 - 328.6	600	SMA	Released
SMA6J5.0 - SMAJ188CAQ	Uni/Bidirectional	5 - 188	6.4 - 248	<0.1	65.2 - 1.8	9.2 - 328.6	600	SMA	Released
SMAJ5.0 - SMAJ200CAQ	Single Bidirectional	5 - 200	6.4 - 248	<1	43.5 - 1.2	9.2 - 324	400	SMA	Released
SMA6J5.0 - SMAJ188(C)AQ	Uni/Bidirectional	5 - 188	6.4 - 248	<0.1	65.2 - 1.8	9.2 - 328.6	600	SMA	Released
P6SMAJ5.0 - P6SMAJ85ADFQ	Unidirectional	5 - 85	6.4 - 108	<0.1	65.2 - 4.4	9.2 - 137	600	DFlat	Released
SMBJ12 - SMBJ100AQ	Single Unidirectional	12 - 100	13.3 - 128	<1	30.2 - 3.7	19.9 - 162	600	SMB	Released
SMBJ12 - SMBJ100CAQ	Single Bidirectional	12 - 100	13.3 - 128	<1	30.2 - 3.7	19.9 - 162	600	SMB	Released
SMCJ5.0 - SMCJ85AQ	Single Unidirectional	5 - 85	6.4 - 104	<1	163 - 10.4	9.2 - 137	1500	SMC	Released
SMCJ5.0 - SMCJ85CAQ	Single Bidirectional	5 - 85	6.4 - 104	<1	163 - 10.4	9.2 - 137	1500	SMC	Released
3.0SMCJ14 - 3.0SMCJ30AQ	Single Unidirectional	14 - 30	15.6 - 36.8	<1	129.3 - 62	23.2 - 48.4	3000	SMC	Released
3.0SMCJ14 - 3.0SMCJ30CAQ	Uni/Bidirectional	14 - 30	15.6 - 36.8	<0.1	129.3 - 62	23.2 - 48.8	3000	SMC	Released
DM5W10 - DM5W36AQ	Single Unidirectional	10 - 36	11.1 - 44.2	<5	211 - 61	17 - 58.1	3600	DO218	Released
D6W10 - DM6W36AQ	Single Unidirectional	10 - 36	11.1 - 44.2	<5	271 - 79	17 - 58.1	4600	DO218	Released
DM8W10 - DM8W43AQ	Single Unidirectional	10 - 43	11.1 - 52.8	<5	226 - 95	29 - 69.4	6600	DO218	Released

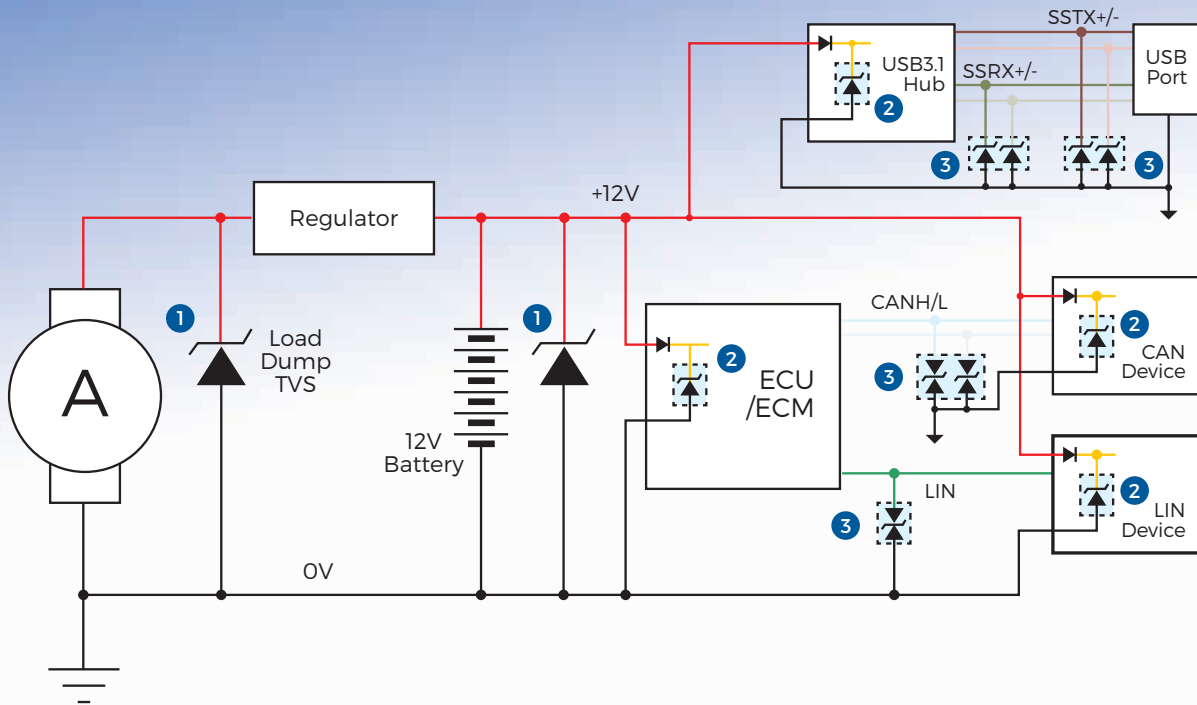
LOW C_j DATA PROTECTION PRODUCTS

AUTOMOTIVE
'Q' PORTFOLIO

Part Number	Channel	Configuration	Channel Input Capacitance C _T Typ (pF)	Breakdown Voltage V _{BR} Min (V)	Reverse Standoff Voltage V _{RWM} (V)	Max. Vcl @ Max IPP (V)	Max. Peak Pulse Current IPP @ 8x20µs Max (A)	Typical Reverse Leakage Current I _R @ V _{RWM} Max (µA)	VESD IEC61000-4-2 Contact Discharge (kV)	Package	Availability
D5V0X1B2LPQ	Single	Bi-directional	0.23	7	5	14	1.5	0.1	±15	X1-DFN1006-2	Released
DESD3V3Z1BCSFQ	Single	Bi-directional	0.25	5	3.3	8	3	1	±8	X2-DSN0603-2	Released
D3V3X1B2LPSQ	Single	Bi-directional	0.25	3.7	3.3	39	3	0.1	±20	U-DFN1006-2 (SWP)	Q4 2022
DESD18VFIBLQ	Single	Bi-directional	0.3	19	18	17	1	0.03	±10	X1-DFN1006-2	Released
DESD24VFIBLQ	Single	Bi-directional	0.3	25	24	32	1	0.03	±9	X1-DFN1006-2	Released
DESD35VFIBLQ	Single	Bi-directional	0.3	36	35	40	1	0.03	±15	X1-DFN1006-2	Released
D5V0X1B2LP3Q	Single	Bi-directional	0.3	7	5	14	1.5	0.1	±15	X2-DFN0603-2	Released
D3V3X4U10LPQ	Quad	Uni-directional	0.45	5.5	3.3	3	3	1	±8	U-DFN2510-10	Released
D15V0X1B2LPQ	Single	Bi-directional	0.5	16.5	15	30	4	1	±20	X1-DFN1006-2	Released
D3V3F4U10LPQ	Quad	Uni-directional	0.5	5.5	3.3	5	5	1	±12	U-DFN2510-10	Released
D5V0FU2LPQ	Single	Uni-directional	0.5	6	5.5	12	1	0.01	±15	X1-DFN1006-2	Released
D5V0FU2S9Q	Single	Uni-directional	0.5	6	5.5	12	1.5	0.01	±15	SOD923	Released
D5V0F2U3LPQ	Dual	Uni-directional	0.5	6	5.5	12	1.5	0.1	±15	X1-DFN1006-3	Released
D8V0X1B2LPQ	Single	Bi-directional	0.5	9.7	8	17	4	1	±20	X1-DFN1006-2	Released
D10V0X2LPQ	Single	Bi-directional	0.5	11.5	10	20	4	1	±20	X1-DFN1006-2	Released
D12V0X1B2LPQ	Single	Bi-directional	0.5	13	12	24	4	1	±20	X1-DFN1006-2	Released
D18V0X1B2LPQ	Single	Bi-directional	0.5	19.7	18	36	3	1	±20	X1-DFN1006-2	Released
DT1140-04LPQ	Quad	Uni-directional	0.5	6	5.5	10	6	0.05	+20/-16	SOT323	Released
D5V0 - D18V0X1B2LP4Q	Single	Bi-directional	0.5	7 - 19.7	5.5 - 18	17 - 36	4	1	±20	X2-DFN1006-2	Released
D5V0FU2LP3Q	Single	Bi-directional	0.5	6	5	12	1.5	0.1	±15	X3-DFN0603-2	Released
DESD1CANFD24VSOQ	Dual	Bi-directional	0.5	25.5	24	42	2.6	0.05	±23	SOT23	Q4 2022
DESD1CANFD24VWQ	Dual	Bi-directional	0.5	25.5	24	42	2.6	0.05	±23	SOT323	Q4 2022
DT1240-04LPQ	Quad	Uni-directional	0.55	6	5.5	11	5.5	0.5	±14	U-DFN2510-10	Released
DT1240A-04LPQ	Quad	Uni-directional	0.55	5	3.3	9.5	5.5	1	±14	SOT323	Released
DT1240A-08LP381OQ	Octal	Uni-directional	0.6	5	3.3	10	5.5	0.5	±14	U-DFN3810-9	Released
DT1142-04SOQ	Quad	Uni-directional	0.65	6.2	5	9	6	0.5	±16	SOT26	Released
D24V0F2U3WQ	Dual	Uni-directional	0.8	27	24	45	5.5	0.1	±10	SOT323	Released
D5V0F2U3WQ	Single	Uni-directional	0.8	7	5	12	3.3	0.01	±25	SOT323	Released
D1213A-01LPQ	Single	Uni-directional	0.85	6	3.3	10	5	0.1	±8	X1-DFN1006-2	Released
D1213A-01WSQ	Single	Uni-directional	0.85	6	6	20	7	1	±25	SOD323	Released
D1213A-02WLQ	Dual	Uni-directional	0.85	6	5.5	17	5	1	±30	SOT323	Released
D1213A-02SOLQ	Dual	Uni-directional	0.85	6	3.3	10	1	0.3	±15	SOT23	Released
D1213A-04VQ	Quad	Uni-directional	1.2	6	3.3	18	5	0.1	±25	SOT563	Released
DT1452-02SOQ	Dual	Uni-directional	1.2	7	5.5	9.5	12		±9.5	SOT23	Released
DT2042-04SOQ	Quad	Uni-directional	1.2	6	5.5	10.5	10	1	±30	SOT23-6	Q4 2022
DBLC051Q	Single	Uni-directional	1.2	6	5	24	25	4.5	±30	SOD323	Q4 2022
DESD1ETH1GLPSQ	Single	Bi-directional	1.5	100	24	-	2	0.001	±30	X1-DFN1006-2	Q4 2022
DRTR5V0U2SRQ	Dual	Uni-directional	1.5	6	5.5	7	5	0.01	±24	SOT-143	Released
DESD2ETH1GSOQ	Dual	Uni-directional	1.8	100	24	-	2.3	24	±30	SOT23	Q4 2022
DESD2ETH100SOQ	Dual	Uni-directional	2.5	100	24	-	3.2	24	±30	SOT23	Q4 2022
DESD5V0U1BLQ	Single	Bi-directional	2.9	5.5	5	7.2	3	0.1	±10	X1-DFN1006-2	Released
D24V0L1B2LPSQ	Single	Bi-directional	6	26	24	46	2	0.001	±20	U-DFN1006-2 (SWP)	Released
D18V0L1B2LPQ	Single	Bi-directional	7	21	20	34	2	0.01	±15	X1-DFN1006-2	Released
D8V0L1B2LP3Q	Single	Bi-directional	8.5	8.5	8	16.5	4	0.1	±25	X3-DFN0603-2	Released
DESD1CAN2WQ	Dual	Bi-directional	9.3	25.4	24	50	3	0.001	±23	SOT323	Released

DATA PROTECTION PRODUCTS AUTOMOTIVE 'Q' PORTFOLIO

Part Number	Channel	Configuration	Channel Input Capacitance C_T Typ (pF)	Breakdown Voltage V_{BR} Min (V)	Reverse Standoff Voltage V_{RWM} (V)	Max. Vcl @ Max IPP (V)	Max. Peak Pulse Current IPP @ 8x20µs Max (A)	Typical Reverse Leakage Current I_R @ V_{RWM} Max (µA)	VESD IEC61000-4-2 Contact Discharge (kV)	Package	Availability
DESD1FLEX2SOQ	Dual	Bi-directional	11	25.4	24	70	3	0.001	±30	SOT23	Released
DESD1CAN2SOQ	Dual	Bi-directional	11	25.4	24	70	3	0.001	±30	SOT23	Released
DESD24VL2BTQ	Dual	Bi-directional	11	24	24	38	3	0.5	±30	SOT23	Released
D5VOL1B2LP3Q	Single	Bi-directional	12.5	6	5	14	6	0.2	±30	X3-DFN0603-2	Released
DESD1LIN2WSQ	Dual	Bi-directional	13	25.4	24	50	1	0.001	±30	SOT323	Released
DESD1IVN27V2WSQ	Single	Bi-directional	14	28	27	45	3	0.05	±30	SOD323	Released
DESD1IVN27V3WSQ	Dual	Bi-directional	14	28	27	45	3	0.05	±30	SOT323	Released
DESD2IVN27V3WQ	Dual	Bi-directional	14	28	27	45	3	0.05	±30	SOT323	Released
D5VOL4B5SOQ	Quad	Bi-directional	15	6	5	14	6	0.1	±30	SOT23-5	Released
DESD15VL2BTQ	Dual	Bi-directional	16	16	15	25	5	0.5	±30	SOT23	Released
D24V0S1B2TQ	Dual	Bi-directional	18	27	24	60	5	0.2	±30	SOD523	Released
DESD12VL2BTQ	Dual	Bi-directional	19	13.5	12	22	5	0.5	±30	SOT23	Released
DESD12V0S1BLQ	Single	Bi-directional	20	15	12	33.5	9	0.1	±30	X1-DFN1006-2	Released
SD24CQ	Single	Bi-directional	24	26.7	24	45	7	0.5	±30	SOD323	Released
D3V3L1B2LP3Q	Single	Bi-directional	28	3.8	3.3	8	12	0.2	±30	X3-DFN0603-2	Released
DUP2105SOQ	Dual	Bi-directional	30	26.2	24	44	8	10	±30	SOT23	Released
DUP3105SOQ	Dual	Bi-directional	30	35.6	32	66	8	10	±30	SOT23	Released
DESD32VS2SOQ	Dual	Uni-directional	36	34	32	50	4	0.1	±30	SOT23	Released
DESD15VS2UTQ	Dual	Uni-directional	40	17.6	15	40	5	0.1	±25	SOT23	Q4 2022
SD15CQ	Single	Bi-directional	44	16.7	15	30	12	0.5	±30	SOD323	Released
DESD24VSU6SOQ	Quint	Uni-directional	45	25.5	24	45	5	0.1	±15	SOT26	Released
DESD5VOL2BTQ	Dual	Bi-directional	45	6	5	12	15	1	±30	SOT23	Released
DESD5VOL2BTQ	Dual	Bi-directional	45	6	5.5	12	15	1	±30	SOT23	Released
DESD5VOL1BAQ	Single	Bi-directional	46	6	5	12	15	0.5	±30	SOD323	Released
SD12CQ	Single	Bi-directional	52.6	13	12	24	15	1	±30	SOD323	Released
D5V0M1U2S9Q	Single	Uni-directional	54	6.2	5.5	12	9	0.01	±30	SOD923	Released
DESD3V3L2BTQ	Dual	Bi-directional	55	3.75	3.3	10	23	1	±30	SOT23	Released
DESD3V3L2BTQ	Dual	Bi-directional	55	3.75	3.3	10	23	1	±30	SOT23	Released
DESD3V3L1BAQ	Single	Bi-directional	56	3.75	3.3	10	23	0.5	±30	SOD323	Released
DUP1105SOQ	Dual	Uni-directional	60	25.7	24	44	8	10	±30	SOT23	Released
DESD12VS2UTQ	Dual	Uni-directional	60	14.7	12	35	5	0.1	±25	SOT23	Q4 2022
SD09CQ	Single	Bi-directional	68	10	9	20	20	1	±30	SOD323	Released
SD09CQ	Single	Bi-directional	68	10	9	20	20	1	±30	SOD323	Released
D3V3H1B2LPQ	Single	Bi-directional	100	3.8	3.3	9.5	40	0.5	±30	X1-DFN1006-2	Released
DESD5V2S2UTQ	Dual	Uni-directional	160	6.4	5.2	20	15	0.1	±25	SOT23	Q4 2022
D36V0S1U2LP1610Q	Single	Uni-directional	165	37	36	59	18	0.2	±30	U-DFN1610-2	Released
D12V0HIU2WSQ	Single	Uni-directional	180	13.3	12	24	25	0.1	±30	SOD323	Released
D24V0S1U2LP1610Q	Single	Uni-directional	210	26	24	42	32	0.2	±30	U-DFN1610-2	Q4 2022
DESD3V3S2UTQ	Dual	Uni-directional	240	5.2	2.3	20	18	0.1	±25	SOT23	Q4 2022
D20V0S1U2LP1610Q	Single	Uni-directional	242	22	20	36	37	0.2	±30	U-DFN1610-2	Q4 2022
D15V0S1U2LP1610Q	Single	Uni-directional	270	17	15	30	48	0.2	±30	U-DFN1610-2	Q4 2022
D12V0S1U2LP1610Q	Single	Uni-directional	400	13	12	20	65	0.2	±30	U-DFN1610-2	Q4 2022



Diodes Incorporated TVS devices cover the full spectrum of automotive TVS requirements, from CAN/LIN and USB ESD protection all the way up to 6.6kW alternator load dump.

1 Load Dump TVS absorbs large amounts of energy from events like alternator load dump, inductive load disconnect, etc. as defined in ISO16750-2

2 Power Line TVS absorbs medium amounts of energy from ESD discharge, ignition spikes, and internal noise and switching.

3 Dataline TVS absorbs smaller amounts of energy, typically from ESD discharge on sensitive datalines. ESD can come from user-facing ports (e.g. USB) or the environment (e.g. in-cabin from carpets etc).

High-speed data interfaces call for low-capacitance parts to maintain signal integrity.

1 LOAD DUMP AND BATTERY DISCONNECT PROTECTION IN DO218 PACKAGE

Series	Power (W)
DM5xxxQ	3600
DM6xxxQ	4600
DM8xxxQ	6600

2 POWER LINE TVS

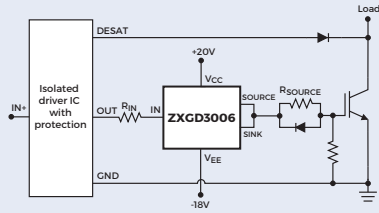
Series	Power (W)
SMAJxxxxxQ	400
SMBJxxxxxQ	600
SMCJxxxxxQ	1500
3.0SMCJxxxxxQ	3000

3 DATA TVS

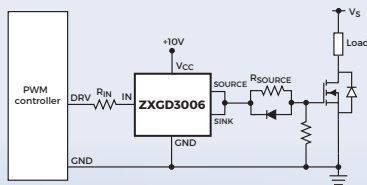
Series	Interface
DESDxxxxxxQ	CAN, LIN, Flex
DUPxxxxxxQ	CAN, LIN
DTxxxxxxQ	USB, HDMI, DVI, Ethernet
DxxxxxxQ	USB, HDMI

GATE DRIVERS AUTOMOTIVE 'Q' PORTFOLIO

IGBT Driving



MOSFET Driving



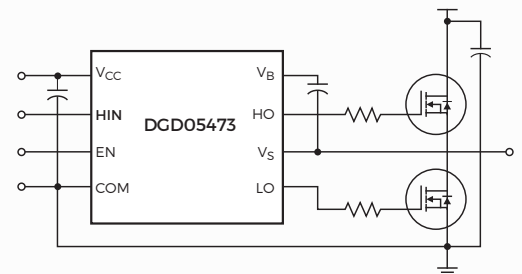
THE DIODES™ ADVANTAGE

- **4A Output From 1mA Input**
High-gain buffer stage for driving the capacitive load of MOSFET and IGBT gates
- **40V Wide Operating Voltage**
Full enhancement to minimize on-state losses
- **Resistant to Latch-up and Shoot-Through**
Bipolar emitter-follower configuration is inherently resistant to latch-up and shoot-through issues
- **Short Propagation Delay**
Less than 10ns propagation delay can rapidly track input

Part Number	VIN & VCC Max (V)	ISOURCE @ IIN (A)	ISINK @ IIN (A)	Ipk Max (A)	IIN Max (A)	Gate Driver Switching Times (typ)				@ Conditions	Package
						td(rise) (Ns)	tr (Ns)	td(fall) (Ns)	tf (Ns)		
ZXGD3003E6Q	40	1.6 @ 10mA	1.4 @ -10mA	5	1	1.8	8.9	1.7	8.9	CL = 1nF; RL = 1Ω; VCC = 12V; VIN = 0-10V; RIN=25Ω	SOT26
ZXGD3004E6Q	40	1.9 @ 10mA	1.9 @ -10mA	8	1	1.1	13.4	0.95	12.4	CL = 1.5nF; RL = 0.1Ω; VCC = 15V; VIN = 0-12.5V; RIN = 25Ω	SOT26
ZXGD3006E6Q	40	4 @ 1mA	3.8 @ -1mA	10	0.1	8	48	16	35	CL = 10nF; RL = 0.18Ω; VCC=15V; VIN = 0-15V; RIN = 21kΩ	SOT26

MOSFET HALF-BRIDGE DRIVING

- 50V Floating High and Low-Side N-Channel Half-Bridge Gate Driver
- Internal Bootstrap Diode and 1.5A Source, 2.5A Sink Output Current Capability
- Low 20ns Propagation Delay and High-Switching Frequency Capability
- Suitable for DC-DC Converters, Wireless Charging, Motor Driving, Class-D Power Amplifiers



Part Number	Gate Driver Type	Integrated Bootstrap Diode	Offset Voltage max (V)	VCC Supply Voltage (V)	Inputs	Output Current io+ typ (mA)	Output Current io- typ (mA)	Internal Deadtime typ (Ns)	t _{on} / t _{off} typ (Ns)	t _{on} / t _{off} typ (Ns)	Package
DGD05473FNQ	HS / LS	Yes	50	4.5 - 14	HIN, LIN, EN	1500	2500	N/A	20 / 23	16 / 12	DFN3030-10

LED DRIVERS AUTOMOTIVE APPLICATIONS

The best Analog ICs provide circuit designers with the most advantageous combination of efficiency, functionality, and package size.

Diodes Incorporated's Automotive LED lighting solutions are not only recognized for their high efficiency and simplicity but also for their flexibility and versatility, making them well suited for Automotive applications.



THE DIODES™ ADVANTAGE

- **Reduced Switching Noise and Ringing**
Solves EMI issues
- **Open-LED, Short-LED, and Overttemperature Protection**
Open-LED - automatically stops switching
Short-LED - duty cycle reduction
- **5% Initial LED Average Current Accuracy**
Meets the accuracy requirements of automotive lighting
- **Automotive Compliant** - AEC-qualified, manufactured in IATF 16949 certified sites, supporting PPAPs

Part Number	Buck	Buck-boost	Boost	Linear	Driver/controller	Input Voltage		Maximum Output Voltage (V)	Maximum LED Current (mA)	LED Current Accuracy (%)	LED Switching Frequency (kHz)	Dimming		Operating Temp Range (°C)	Sense Voltage (mV)	Packages
						Min (V)	Max (V)					PWM	Analog			
AL5801Q	-	-	-	Y	D	5	100	100	350	-	N/A	Y	N	-40 to +125	560	SOT26
AL5809Q	-	-	-	Y	D	2.5	60	60	15, 20, 25, 30, 40, 50, 60, 90, 120, 150	5	N/A	Ext	N	-40 to +125	N/A	PowerDI123
AL5810Q	-	-	-	Y	D	2.5	60	60	200	5	N/A	Ext	-	-40 to 125	N/A	W-DFN2020-3/SWP, TO252
AL5814Q	-	-	-	Y	C		60	-	Ext. /BJT		N/A	Y	N	-40 to +125	200	MSOP-8EP
AL5816Q	-	-	-	Y	C		60	-	Ext. /BJT		N/A	Y	N	-40 to +125	200	SOT25
AL5873Q	-	-	-	Y	D	5	55	55	250	4	N/A	Y	Y	-40 to 125	N/A	TSSOP-16EP
AL8400Q	-	-	-	Y	C	2	18	-	Ext. /BJT	3	N/A	Ext	N	-40 to +125	200	SOT353
AL8843Q	Y	-	-	-	D	4.5	40	40	3000	5	1000	Y	Y	-40 to +125	100	SO-8EP
AL8860Q/61Q	Y	-	-	-	D	4.5	40	40	1500	5	1000	Y	Y	-40 to +125	100	MSOP-8EP
AL8862Q	Y	-	-	-	D	5	55	55	1000	5	1000	Y	Y	-40 to +125	100	SO-8EP
AL8871Q	-	-	Y	-	C	5	60	Ext. MOSFET		5	1000	Y	Y	-40 to +125	225	TSSOP-16EP
BCR401Q	-	-	-	Y	D	1.4	40	40	10 to 100	10	N/A	Y	N	-55 to +150	700	SOT26
BCR402Q	-	-	-	Y	D	1.4	40	40	20 to 100	10	N/A	Y	N	-55 to +150	700	SOT26
BCR405Q	-	-	-	Y	D	1.4	40	40	50 to 100	10	N/A	Y	N	-55 to +150	700	SOT26
BCR420Q	-	-	-	Y	D	1.4	40	40	10 to 200	10	N/A	N	N	-55 to +150	700	SOT26, U-DFN2020-6
BCR421Q	-	-	-	Y	D	1.4	40	40	10 to 350	10	N/A	Y	N	-55 to +150	700	SOT26, U-DFN2020-6
BCR430Q	-	-	-	Y	D	5	42	40	100	5	N/A	Ext	Ext	-40 to 125	892	SOT26
ZXLD1366Q	Y	-	-	-	D	6	60	60	1000	2.5	500	Y	Y	-40 to +125	200	SO-8EP, TSOT25, V-DFN3030-6
ZXLD1370Q	Y	Y	Y	-	C	6.5	60	Ext. MOSFET		2	1000	Y	Y	-40 to +125	218	TSSOP-16EP
ZXLD1371Q	Y	Y	Y	-	C	5	60	Ext. MOSFET		2	1000	Y	Y	-40 to +125	218	TSSOP-16EP
ZXLD1374Q	Y	Y	Y	-	D	6.5	60	60	1500	2	1000	Y	Y	-40 to +125	218	TSSOP-20EP
ZXLD1615Q	-	-	Y	-	D	2.7	5.5	28	-	-	350	N	N	-40 to +85	1250	TSOT25

LED LIGHTING AUTOMOTIVE APPLICATIONS

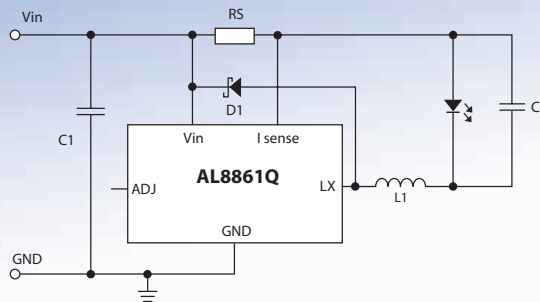
LED DOOR LIGHTING

Application Requirements

- 9V ~ 16V typical input voltage range
- High efficiency drive of one LED in series
- Wide temperature range $>+85^{\circ}\text{C}$
- Withstands load dump
- Meets AEC-Q100 automotive quality requirements

THE DIODES™ ADVANTAGE

- **7V ~ 60V Input Range**
Supports normal battery range and load dumps
- **1A Switch**
Drives 0.5, 1, and 3W LEDs
- **Automotive Compliant**
AEC-Q100 grade 1 qualified, manufactured in IATF 16949 certified sites, supporting PPAPs
- **High Accuracy:**
ZXLDI366Q: 2.5%
AL8861Q: 5%
AL8862Q: 5%



KEY PRODUCTS

- AL8861Q
- AL8862Q
- PDS3S140Q D1
- ZXLDI366Q

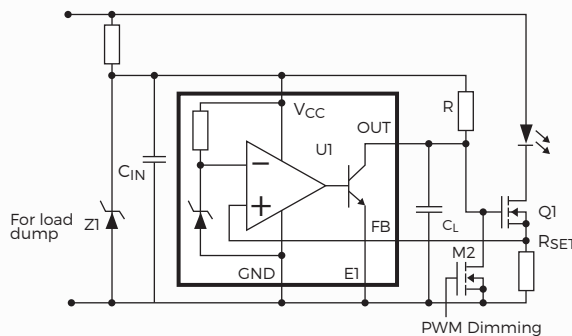
INTERIOR LAMP

Application Requirements

- Operates over whole battery (9V ~ 16V) voltage range
- Wide temperature range $>+85^{\circ}\text{C}$
- Simple cost-effective solution for driving 50mA ~ 150mA LEDs
- Meets AEC-Q100 automotive quality requirements

THE DIODES™ ADVANTAGE

- **Automotive Compliant**
AEC-Q100 grade 1 qualified, manufactured in IATF 16949 certified sites, supporting PPAPs
- **Drives External Transistor**
Determines LED current and power dissipation capability
- **Simple Cost-Effective Solution**



KEY PRODUCTS

- AL5809Q
- AL5810Q
- AL5871Q
- AL8400Q U1
- BCR42xxQ
- BCR430Q
- BZT52C12Q Z1
- DMN6068SEQ Q1
- ZXMN4A06GQ Q1
- 2N7002M2Q Q2

LED LIGHTING AUTOMOTIVE APPLICATIONS

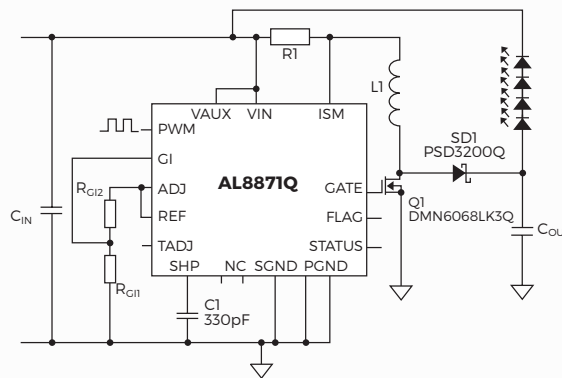
DAYTIME RUNNING LIGHTS

Application Requirements

- Operates over whole battery (9V - 16V) voltage range
- High-efficiency drive of LEDs
- Wide temperature range $>+85^{\circ}\text{C}$
- Withstands load dump
- Meets AEC-Q100 automotive quality requirements

THE DIODES™ ADVANTAGE

- Multi-Topology LED Drivers**
Buck-boost mode works over V_{BATT} range driving LED chain used in DRL
- ZXLD Operates From 60V Down to 5V**
- 2% Accuracy**
Better matching between DRL pair
- Automotive Compliant**
- AEC-Q100 grade 1 qualified, manufactured in IATF 16949 certified sites, supporting PPAPs
- Ambient Temperature Range up to $+125^{\circ}\text{C}$**
- LED Thermal Protection Loop**



KEY PRODUCTS

- AL8871Q
- DMN6068LK3Q Q1
- PDS3200Q SD1

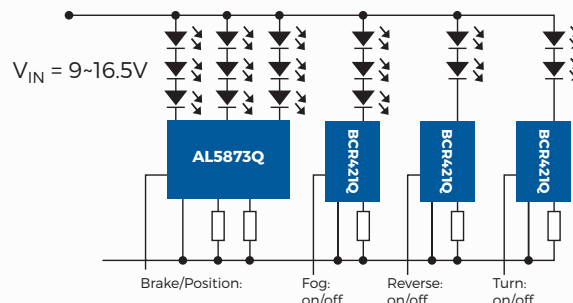
REAR LAMP CLUSTER

Application Requirements

- Operates over whole battery (9 - 16V) voltage range
- Wide temperature range $>+85^{\circ}\text{C}$
- Simple cost-effective solution for driving 20 - 50mA LEDs
- Meets automotive quality requirements

THE DIODES™ ADVANTAGE

- Automotive Compliant**
- AEC-Q100 grade 1 qualified, manufactured in IATF 16949 certified sites, supporting PPAPs
- Ambient Temperature Range $>+85^{\circ}\text{C}$**
- Simple Cost-Effective Solution**



KEY PRODUCTS

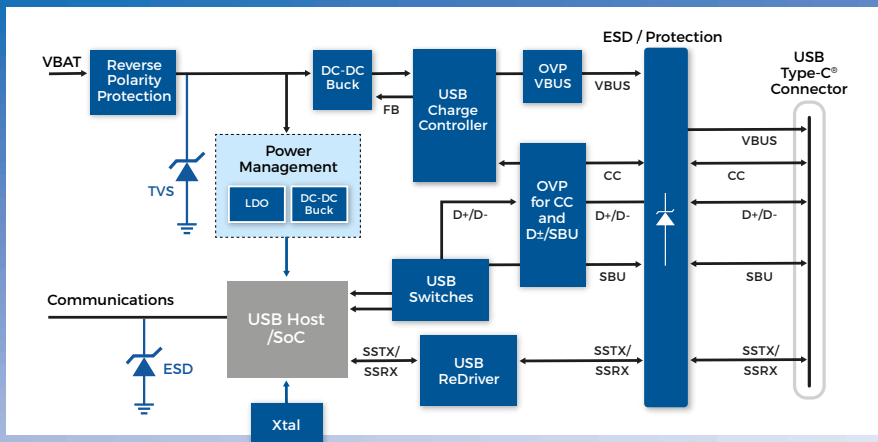
- AL5809Q
- AL5810Q
- AL5873Q
- AL8400Q
- BCR421Q
- BCR430Q

USB SOLUTIONS AUTOMOTIVE 'Q' PORTFOLIO

THE DIODES™ ADVANTAGE

Diodes Incorporated's USB Solutions provide simple and robust solutions to both the data path and the charging power path.

- **Automotive Compliant**
 - AEC-qualified, manufactured in IATF 16949 certified sites, supporting PPAPs



USB POWER, CHARGING AND PROTECTION

Part Number	Function	VBUS Power Switch	Vbus				D+/D-				CC/SBU				Status
			Short to GND	Vbat	Vbus	ESD	Short to GND	Vbat	Vbus	ESD	Short to GND	Vbat	Vbus	ESD	
DPS1133FIAQ	Vbus Power switch	Yes	OCF	24V	24V	-	-	-	-	-	-	-	-	-	Production
AP22653Q	Vbus Power switch	Yes	SCP	No	No	-	-	-	-	-	-	-	-	-	Production
AP22654Q/5Q**	Vbus Power switch	Yes	SCP	No	No	-	-	-	-	-	-	-	-	-	Sampling
AP25810LQ	USB-C UFP ctrl	Yes	OCF	No	5V	2kV	-	-	-	-	Yes	No	5V	2kV	Production
PI5USB2546AQ	USB 2 CDP/DCP	Yes	OCF	No	5V	2kV	-	-	-	-	-	-	-	-	Production
AP43776Q*	USB PD ctrl	Ext	I_lim	-	-	-	Yes	No	5V	2kV	Yes	24V	24V	2kV	Development
DPO2039Q	CC/SBU OVP	No	-	-	-	-	Yes	24V	24V	8kV	Yes	24V	24V	8kV	Production
PI3USB4000DQ	USB2 2:1 Mux	No	-	-	-	-	Yes	24V	24V	10kV	-	-	-	-	Production
PI3USB4002AQ	USB2 Sw	No	-	-	-	-	Yes	24V	24V	10kV	-	-	-	-	Production

USB TYPE-C PROTECTION IC

Part Number	Function	Input Voltage V	Max Load Current GND	OCF	OVP	Reverse Protection	Thermal Shutdown (°C)	VBUS R _{DS(ON)} (mΩ)	Slew Rate Control	Output Discharge	Fault Flag	USB Fast-role Swap	IEC61000 -4.2	Package
DPS1133FIAQ	VBUS	4.5 to 24	3.5	Adj.	24V	Yes	165	30	Adj.	Yes	Yes	Yes	-	V-QFN4040-17
AP22653Q	5-V VBUS	3 to 5.5	3	Adj.	No	Yes	150	55	Yes	Yes	Yes	No	16kV (with ext caps)	SOT26
AP22654Q/5Q**	5-V VBUS	3 to 5.5	3	Adj.	No	Yes	150	50	Yes	Yes	Yes	No	16kV (with ext caps)	TSOT26
DPO2039Q	CC & SBU	2.7 to 24	-	No	24V (auto-recovery)	No	150	-	No	No	Yes	No	Yes	U-QFN3030-16

ESD/TRANSIENT PROTECTION TVS

Part Number	Protection	#Ch	Direction	V _{BR} (MIN) (V)	C _j (pF)	Max Vc @Ipp (8/20us) (V)	Package
D5V0S1U2LP1610Q	VBUS	1	Uni	-	800	11.5V @ 120A	DFN1610
D12V0S1U2LP1610Q	VBUS	1	Uni	-	-	20V @ 65A	DFN1610
D20V0S1U2LP1610Q	VBUS	1	Uni	-	-	36V @ 37A	DFN1610
D24V0S1U2TQ	VBUS	1	Uni	27	35	42V @ 6A	SOD523
D5V0HIU2LP1610Q	CCx	1	Uni	5.5	800	12.5V @ 30A	DFN1610
D3V3H1B2LPQ	SBUX	1	Bi	3.8	100	9V @ 40A	DFN1006
DESD3V3Z1BCSFQ	USB3.x	1	Bi	5	0.17	4.5V @ 3.5A	DSN0603
D5V0X1BA2LPQ	USB3.x	1	Bi	7	0.48	16V @ 4A	DFN1006
DT1240-04LPQ	USB2.0	4	Uni	5	0.55	9.4V @ 5.5A	DFN2510

*In Development - sampling, production expected 4Q 2022. ** Sampling, production expected 2Q 2023.

USB SOLUTIONS AUTOMOTIVE 'Q' PORTFOLIO

USB CHARGING IC

Features		PI5USB2546AQ	AP25810LQ	AP43776Q*
Power Port Control/Management		Yes	Yes	
Power MOSFET R _{ON}		73mΩ	34mΩ	External 30V (<10mΩ) NMOS
YD/T 1591-2009 charging (D+/D- shorted and charging)		Yes	No	Yes
BC 1.2: DCP, SDP, CDP		Yes	No D+/D- pins So external decoding required	Yes
Non-BC 1.2 charging:	Apple 1A, 2A (Divider-1A, -2A) charging	Yes		Yes
	Samsung 1.2V fast charging (DCP-1.2V)	Yes		Yes
	Apple 2.4A charging, (Divider-2.4A)	Yes		Yes
USB PD Type C standard (15W and above).		No	15W non-PD	USB-PD 3.0 PPS (3.3-21V)
Low power supply with limit at 30mA (eMarker supply)		No	No	YES
Cable compensation		External - current sense amp to Buck converter FB input		Yes - I2C comm to Buck-boost
Fault indications		Yes	Yes	Yes
Adjustable USB Output Current limit.		Ext res adj.	Selectable	Yes
Short circuit protection on VBus/Data/CC lines: Short to	GND	5V-VBUS SCP	5V-VBUS SCP	External NMOS
	Vbatt (14V)	VBUS: External CC & D±/SBU: DPO2039Q		CC
VBUS Reverse leakage protection		Yes (when off)		Yes (via buck-boost & ext NMOS)

VBUS DC-DC CONVERTER GENERATION

Part Number	Type	Max V _{IN} (V)	I _{OUT} (A)	V _{OUT} (V)	F _{sw} (kHz)	Power Good	Adj F _{sw}	Sync to Ext. CLK	Ext. Comp	Adj. Soft-Start	HLLE	I _Q (μA)	Package
AP63356Q	Buck	32	3.5	Adj	450	Y	N	N	Y	N	Y	258	V-DFN3020-13/SWP
AP63357Q	Buck	32	3.5	Adj	450	Y	N	N	Y	N	N	22	V-DFN3020-13/SWP
AP64350Q	Buck	40	3.5	Adj	100 to 2200	N	Y	Y	Y	N	Y	22	SO-8EP
AP64351Q	Buck	40	3.5	Adj	570	N	N	N	Y	Y	Y	22	SO-8EP
AP64352Q	Buck	40	3.5	Adj	100 to 2200	N	Y	Y	N	Y	Y	22	SO-8EP

USB DATA SWITCHES AND REDRIVERS

Part Number	Description	AEC-Q100 Grade		
USB (ACTIVE) SIGNAL INTEGRITY/REDRIVERS				
PI3EQX7741AIQ	3.3V, USB3.2 5.0Gbps ReDriver with Equalization & Emphasis	1-port (Rx & Dx)	Extends the drive length of USB3	Grade 3
PI3EQX501BQ		1-channel		Grade 3
PI3DPX1207Q	USB3.2 Gen2 with Alt-DP1.4 redriver	Supports DP1.4 on USB-C cables	Grade 3	
CROSSBAR SWITCH				
PI3DBS16222Q**	3.3V, 20Gbps 4-Channel 2x2 Exchange Switch	USB-C SS channel routing	Grade 2	
USB 2.0 (PASSIVE) SWITCHES/MUXES				
PI3USB221EQ	USB2 2:1 Mux with 5V D± withstand capability		Grade 1	
PI3USB4000DQ	USB2.0 with High-Voltage 24V D± withstand capability	2:1/1:2 USB Mux	Protects USB-C system from shorts on D± to VBUS/VBATT	Grade 1
PI3USB4002AQ		USB Switch		Grade 1

REVERSE POLARITY/VOLTAGE PROTECTION

Part Number	Description	Operating Voltage (V)	Withstand Voltage (A)	R _{DS(ON)} (mΩ)	V _{GS WITHSTAND} (V)	Max V _{th/Vf} (V)	Load Current (A)	Ambient Temperature Range (°C)	Package	Status
AP74700Q	Ideal Diode Controller	3.2 to 65V	±65	Ext. NMOS	-	-	Ext. MOSFET	-40 to 125	SOT26	Production
DMP4011SPSQ	PMOS RVP	-	40	10	20	2.5	11	-55 to +150	PowerDI5060-8	Production
DMTH43M8LPSQ	NMOS RVP Switch	-	40	3.3	20	2.5	22	-55 to +175	PowerDI5060-8	Production
SBR8M100P5Q	RVP SBR	-	100	-	-	0.88	8	-55 to +175	PowerDI5	Production

** Sampling, production expected 2Q 2023.

VOLTAGE REGULATION AUTOMOTIVE 'Q' PORTFOLIO

THE DIODES™ ADVANTAGE

- Automotive Compliant - AEC-qualified, manufactured in IATF 16949 certified sites, supporting PPAPs
- High-efficiency synchronous buck converters optimised for low EMI
- High-PSRR LDOs with low noise
- Industry-standard pin-out and packages



AUTOMOTIVE DC-DC BUCK CONVERTERS

Part Number	Min V _{IN} (V)	Max V _{IN} (V)	I _{OUT} (A)	V _{OUT} (V)	High-side R _{DS(ON)} (mΩ)	Low-side R _{DS(ON)} (mΩ)	f _{sw} (kHz)	Power Good	Adj fsw	Sync to ext Clk	Ext comp	Adj Soft-Start	HLLE	I _o (μA)	I _{sb} (μA)	AEC-Q100 Grade	Package
AP61100Q	2.3	5.5	1	Adj	110	80	2200	N	N	N	N	N	ADJ	15	0.1	1	SOT563
AP61102Q	2.3	5.5	1	Adj	110	80	2200	Y	N	N	N	N	ADJ	15	0.1	1	SOT563
AP61300Q	2.4	5.5	3	Adj	70	50	2200	N	N	N	N	N	ADJ	19	0.1	1	SOT563
AP61302Q	2.4	5.5	3	Adj	70	50	2200	Y	N	N	N	N	ADJ	19	0.1	1	SOT563
AP63200Q	3.8	32	2	Adj	125	68	500	N	N	N	N	N	Y	22	1	1	TSOT26
AP63201Q	3.8	32	2	Adj	125	68	500	N	N	N	N	N	N	370	1	1	TSOT26
AP63203Q	3.8	32	2	3.3	125	68	1100	N	N	N	N	N	Y	22	1	1	TSOT26
AP63205Q	3.8	32	2	5	125	68	1100	N	N	N	N	N	Y	22	1	1	TSOT26
AP63300Q	3.8	32	3	Adj	75	40	500	N	N	N	N	N	Y	22	1	1	TSOT26
AP63301Q	3.8	32	3	Adj	75	40	500	N	N	N	N	N	N	280	1	1	TSOT26
AP63356Q	3.8	32	3.5	Adj	74	40	450	Y	N	N	Y	N	Y	258	0.6	1	V-DFN3020-13 SWP
AP63357Q	3.8	32	3.5	Adj	74	40	450	Y	N	N	Y	N	N	22	0.6	1	V-DFN3020-13/SWP
AP64060Q	4.5	40	0.6	Adj	600	300	2200	N	N	N	N	N	Y	0.09	1	1	TSOT26
AP64100Q	3.8	40	1	Adj	150	80	100 to 2200	N	Y	Y	Y	N	Y	25	1	1	SO-8EP
AP64102Q	3.8	40	1	Adj	150	80	100 to 2200	N	Y	Y	N	Y	Y	25	1	1	SO-8EP
AP64200Q	3.8	40	2	Adj	150	80	100 to 2200	N	Y	Y	Y	N	Y	25	1	1	SO-8EP
AP64202Q	3.8	40	2	Adj	150	80	100 to 2200	N	Y	Y	N	Y	Y	25	1	1	SO-8EP
AP64350Q	3.8	40	3.5	Adj	75	45	100 to 2200	N	Y	Y	Y	N	Y	22	1	1	SO-8EP
AP64351Q	3.8	40	3.5	Adj	75	45	570	N	N	N	Y	Y	Y	22	1	1	SO-8EP
AP64352Q	3.8	40	3.5	Adj	75	45	100 to 2200	N	Y	Y	N	Y	Y	22	1	1	SO-8EP
AP64500Q	3.8	40	5	Adj	45	20	100 to 2200	N	Y	Y	Y	N	Y	25	1	1	SO-8EP
AP64501Q	3.8	40	5	Adj	45	20	570	N	N	N	Y	Y	Y	25	1	1	SO-8EP
AP64502Q	3.8	40	5	Adj	45	20	100 to 2200	N	Y	Y	N	Y	Y	25	1	1	SO-8EP
AP66200Q*	3.8	60	2	Adj	150	80	500 to 2500	Y	Y	Y	N	Y	Y	40	1.5	1	U-QFN4040-16/SWP
AP66300Q*	3.8	60	3	Adj	120	54	500 to 2500	Y	Y	Y	N	Y	Y	43	2.2	1	U-QFN4040-16/SWP

*In Development - sampling, production expected 4Q 2022

AUTOMOTIVE LINEAR/LDO REGULATORS

Part Number	Type	I _{out} (A)	V _{in} (Max) (V)	V _{in} (Min) (V)	Output Voltage (V)	V _{DROPOUT} (Max) (V)	I _q (typ) (μA)	Accuracy 25°C (%)	PSRR @ 1kHz (dB)	Enable	Output Discharge	Power Good	Ambient Temperature (°C)	Packages
AP7315DQ	LDO	0.15	5.25	1.7	1.1, 1.2, 1.5, 1.8, 2.5, 2.7, 2.8, 2.9, 3.0, 3.3	0.29	35	1	75	Yes	Yes	No	-40 to 125	SOT25
AP7315Q	LDO				Yes					No				
AP7343DQ	LDO	0.3	5.25	1.7	0.9, 1.0, 1.1, 1.2, 1.5, 1.8, 2.5, 2.7, 2.8, 2.9, 3.0, 3.3	0.31	35	1	75	Yes	Yes	No	-40 to 125	SOT25
AP7343Q	LDO				Yes					No				
AP7347DQ	LDO	0.5	5.5	1.7	1.0, 1.05, 1.1, 1.2, 1.5, 1.8, 2.2, 2.5, 2.8, 2.9, 3.3, 5.0	0.32	60	1	75	Yes	Yes	No	-40 to 125	SOT25, W-DFN2020-6/SWP
AP7375Q	LDO	0.3	4.5	3	1.8, 3.0, 3.3, 5.0	0.65	2.1	2	85	Yes	No	No	-40 to 125	SOT89, TO252-4, SO-8EP
AP7387Q*	LDO	0.15	6.0	5	3.3, 3.3, 6.5	1.1	2	2	70	No	No	No	-40 to 125	SOT89, W-DFN2020/SWP
AP7583AQ*	LDO	0.3	4.2	V _{OUT} +1	3.3, 5.0, ADJ (1.2)	0.5	10	1	70	Yes	No	Yes	-40 to 125	MSOP-8, TO252, W-DFN2020/SWP
AP7583Q*	LDO						2.5			No				
ZLDO1117Q	LDO	1	20	V _{OUT} +1.5	1.2, 1.5, 1.8, 2.5, 3.3, 5.0, ADJ (1.25)	1.35	4000	1	80	No	No	No	-40 to 125	SOT223, TO252
ZMR250Q	Linear Reg	0.05	22.5	4.5	2.5	1.4	40	0.025	75	No	No	No	-55 to 125	SOT23
ZMR330Q	Linear Reg	0.05	24	5.3	3.3	1.44	170	0.025	72	No	No	No	-55 to 125	SOT23
ZMR500Q	Linear Reg	0.05	25	7	5	1.2	70	0.025	72	No	No	No	-55 to 125	SOT23
ZXTR2005ZQ	Linear Reg	0.03	100	10	5	1.5	270	0.1	45 (100Hz)	No	No	No	-40 to 125	SOT89
ZXTR2105FFQ	Linear Reg	0.015	7	60	5	-	450	5	46 (100Hz)	No	No	No	-40 to 125	SOT23F
ZXTR2105FQ	Linear Reg	0.03	7	60	5	-	450	5	46 (100Hz)	No	No	No	-40 to 125	SOT23
ZXTR2108FQ	Linear Reg	0.015	10	60	8	-	500	10	46 (100Hz)	No	No	No	-40 to 125	SOT23
ZXTR2112FQ	Linear Reg	0.015	15	60	12	-	500	10	50 (100Hz)	No	No	No	-40 to 125	SOT23

* In Development - sampling, production expected 4Q 2022

SHUNT REGULATORS/REFERENCES AUTOMOTIVE 'Q' PORTFOLIO

THE DIODES™ ADVANTAGE

- Extended -40° to +125°C Ambient Temperature Range Meets requirements for automotive applications except under the hood
- Industry-Standard Pin-Out and Packages
- Automotive Compliant AEC qualified, manufactured in IATF 16949 certified sites, supporting PPAPs



Part Number	Reference Voltage (V)	Accuracy (%)	Max Input Voltage (V)	Sink Current (mA)	Min Cathode Current for Regulation Typ (μA)	Operating Ambient Temperature Range (°C)	AEC-Q100 Grade	Packages
SHUNT REGULATORS								
ZTL431Q	2.5	0.5; 1	20	100	400	-40 to +125	1	SOT23; SOT25
ZTL432Q†	2.5	0.5; 1	20	100	400	-40 to +125	1	SOT23
TLV431Q	1.24	0.2; 0.5; 1	18	15	55	-40 to +125	1	SOT23; SOT25
AZ9431Q	1.24	1	18	100	55	-40 to +125	1	SOT23
SHUNT REFERENCES								
LM4040-xxQ	2.5, 3.0, 3.3, 4.096, 5.0	0.2; 0.5; 1	N/A	15	60	-40 to +125	1	SOT23
LM4041Q	1.225	0.5; 1	N/A	12	30	-40 to +125	1	SOT23
LM4041_ADJQ	1.233	1	10	12	30	-40 to +125	1	SOT23
ZRC330Q	3.30	2; 1	N/A	5	20	-40 to +85	1	SOT23

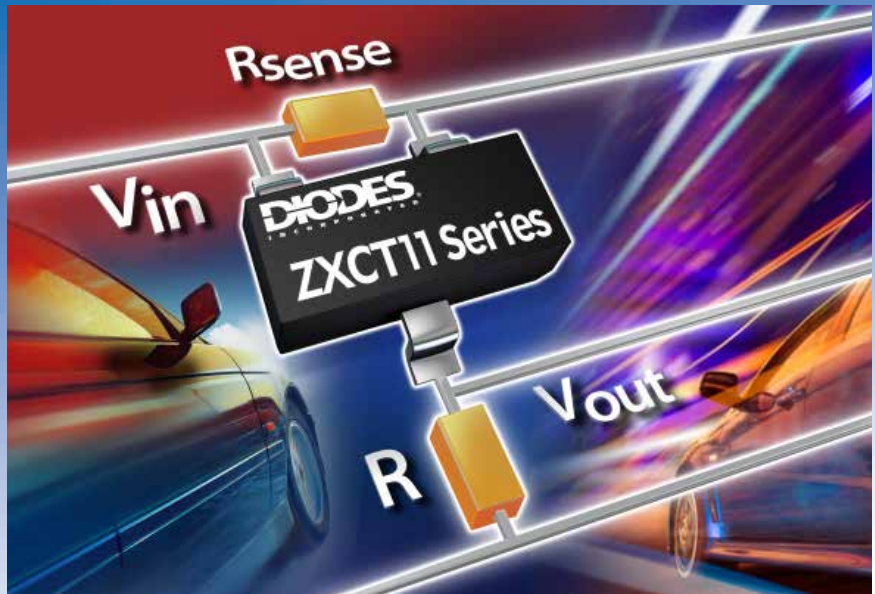
† Reverse pinout to ZTL431Q in SOT23

HIGH-SIDE CURRENT MONITORS AUTOMOTIVE 'Q' PORTFOLIO

Diodes' current monitors offer simple, cost-effective solutions to high-side current sensing. The current-output versions provide a variable gain while the voltage-output versions provide fixed gain and require only one external resistor.

THE DIODES™ ADVANTAGE

- **High-Side Current Sensing**
Doesn't disturb the ground plane
- **Up to 2.5V Sense Voltage** Measures larger transient currents while keeping accuracy at lower currents
- **Up to 60V Common-Mode Sensing**
Withstands load-dump conditions
- **1% Typical Accuracy** Meets accuracy requirements of applications
- **Automotive Compliant AEC** qualified, manufactured in IATF 16949 certified sites, supporting PPAPs



Part Number	Description	V _{IN} (V)	V _{CC} (V)	Accuracy @ 100mV	Quiescent Current	$\left(\frac{\text{Gain}}{V_{\text{OUT}}}\right) / V_{\text{SENSE}}$	Bandwidth (MHz)	Package
CURRENT OUTPUT								
ZXCT1008Q/9Q	Cost-Effective Current Monitor	2.5 to 20	N/A	±2.5%	4µA	10mA/V	2	SOT23
ZXCT1082Q	60V Improved Accuracy	2.7 to 60	2.5 - 60	2%	25µA	Prog	0.5	SOT25
ZXCT1083Q	40V Improved Accuracy	2.7 to 40	2.5 - 40	2%	25µA	Prog	0.5	SOT25
ZXCT1107Q/9Q	High-Accuracy and Cost-Effective	2.5 to 36	N/A	±3.4%	3µA	4mA/V	0.3	SOT23
ZXCT1110Q	Improved Offset over ZXCT1107/9	2.5 to 36	N/A	±1.8%	3µA	4mA/V	0.3	SOT25
VOLTAGE OUTPUT								
ZXCT1080Q	60V Common-Mode Range	3 to 60	4.5 - 12	±3%	30µA	10	0.5	SOT25
ZXCT1081Q	40V Common-Mode Range	3 to 40	4.5 - 12	±3%	30µA	10	0.5	SOT25
ZXCT1084Q/5Q	60V/40V Common-Mode Enhanced Performance	2.7 to 60/40	2.5 - 60/40	2%	25µA	25	0.5	SOT25
ZXCT1086Q/7Q						50		
ZXCT199Q**	High Precision Rail-to-Rail Bidirectional Current Monitor	-0.1 to 26	2.7 to 26	80µV	65	50, 100, 200	0.07-0.014	SOT363

CURRENT MONITORS AUTOMOTIVE APPLICATIONS

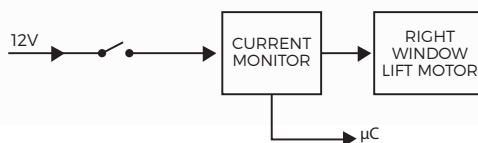
WINDOW LIFT

Application Requirements

- High-side current measurement so that ground reference point is not disturbed
- Wide operating temperature range
- AEC-Q100 qualification

THE DIODES™ ADVANTAGE

- ZXCT1109Q qualified to AEC-Q100 grade 1 (up to 125°C ambient)
- Up to 36V common-mode voltage
- Up to 800mV sense voltage (can be extended by a couple of resistors)
- Only two resistors required to measure current and set gain



KEY PRODUCTS

- ZXCT1008Q
- ZXCT11xxQ Series
- ZXCT108xQ

AMPLIFIERS AND COMPARATORS AUTOMOTIVE 'Q' PORTFOLIO

THE DIODES™ ADVANTAGE

- Automotive Compliant**
 AEC qualified, manufactured in IATF 16949 certified sites, supporting PPAPs
- 1x, 2x, and 3x Selectable Charge-Pump Boost Gives up to 18V_{pp} Output**
 High sound levels from a low supply voltage with improved system design flexibility and efficiency
- Efficient Solution**
 Automatic standby and wake-up control or manual stand-by control
- Input Signal 20Hz to 300kHz**
 Wider input suitable for different Audio or Sounder applications

AUTOMOTIVE AUDIO AMPLIFIERS



Part Number	Min. V _{DD} (V)	Max. V _{DD} (V)	I _Q (mA)	Mono or Stereo	Bridge-Tied-Load (BTL)	Single-Ended (SE)	Class-D or -AB	Volume/Gain	Max Gain	SNR	Ambient Temperature Range (°C)	Package
PAM8904Q	2.3	5.5	1	Mono	Yes	No	D	3- Step	N/A	N/A	-40 to +105	U-QFN3030-16 (Type B)

AUTOMOTIVE OP AMPS

Part Number	Number of Channels	Supply Voltage		Supply Current (mA)	Input Offset Voltage (mV)	Input Bias Current (nA)	Input Common Mode Voltage		Output Current (mA)	Rail-Rail Input/Output	Ambient Temperature Range (°C)	Packages
		Min (V)	Max (V)				Min (V)	Max (V)				
LM2902Q/AQ	4	3	36	0.7	2/1	-20	0	V _{CC} -1.5	±16	No	-40 to +125	SO-14, TSSOP-14
LM2904Q/AQ	2	3	36	0.5	2/1	-20	0	V _{CC} -1.5	±16	No	-40 to +125	SO-8, MSOP-8, TSSOP-8
AS2333Q	2	1.8	5.5	0.012	0.008	0.07	V ₋ -0.1	V ₊ +0.1	-5/+25	Yes/Yes	-40 to +125	SO-8
AS2376Q	2	1.8	5.5	0.012	0.008	0.07	V ₋ -0.1	V ₊ +0.1	-5/+25	Yes/Yes	-40 to +125	MSOP-8, SO-8

AUTOMOTIVE COMPARATORS

Part Number	Number of Channels	Supply Voltage		Supply Current per ch (mA)	Input Offset Voltage (mV)	Input Bias Current (nA)	Input Common Mode Voltage		Output Current Sink (mA)	Output Stage	Ambient Temperature Range (°C)	Packages
		Min (V)	Max (V)				Min (V)	Max (V)				
LM2901Q/AQ	4	3	36	0.9	2/1	-25	0	V _{CC} -1.5	±16	Open-collector	-40 to +125	SO-14, TSSOP-14
LM2903Q/AQ	2	3	36	0.6	2/1	-25	0	V _{CC} -1.5	±16	Open-collector	-40 to +125	SO-8, MSOP-8, TSSOP-8

** In Development – sampling, production expected 1Q 2023

HALL SWITCHES AUTOMOTIVE 'Q' PORTFOLIO

Diodes' Automotive Hall-effect Switches provide simple and reliable solutions to contactless switching in automotive applications

Typical application areas include open and close detection, rotation, and position monitoring.

Diodes' Automotive Hall-effect switch portfolio includes three single-channel families:

Latch Output latches with one field polarity and changes state only when opposite field is applied.

Unipolar Responds to either a N or S field; dependent on package (see below).

Omnipolar Responds to any magnetic field polarity. Magnet's polarity not critical.



THE DIODES™ ADVANTAGE

- **Automotive Compliant**
AEC qualified, manufactured in IATF 16949 certified sites, supporting PPAPs
- **Wide Operating Range**
3V to 28V over -40° to +150°C
- **8kV ESD Rating**
- **Comprehensive Portfolio:**
8 Latches
10 Unipolar Switches
3 Omnipolar Switches
- **Simple Cost-Effective Solution**
- **Wide Protection Features:**
 - Low-leakage reverse-blocking diodes
 - Zener clamps on supply and output pins
 - Output (tight tolerance) Overcurrent limit
 - 32V load-dump capability
- **Industry-Standard Pin-Out and Packages**
SOT23, SC59, and SIP3
SC59 offers reverse polarity to SOT23
- **Open-Drain Output**
Easily interfaces to 3.3V and 5V μ C

Part Number	Type	Output Type	Operating Voltage (V)	Average Supply Current (mA)	Output Current (mA)	Operating Point Bop (Gauss)			Release Point Bop (Gauss)			Ambient Temperature Range (°C)	Packages	Availability									
						Min	Typ	Max	Min	Typ	Max												
AH3322Q	Unipolar	Single, Open-Drain, Active Low	3 to 28	3	30	15	30	45	5	20	35	-40 to +150	SC59, SOT23, SIP-3	2Q 2023									
AH3323Q						40	55	72	20	35	50				-40 to +150								
AH3324Q						60	80	100	40	60	80					-40 to +150							
AH3325Q						80	100	120	60	80	100						-40 to +150						
AH3326Q						65	100	135	50	85	120							-40 to +150					
AH3327Q						95	115	140	70	90	120								-40 to +150				
AH3328Q						130	155	180	105	130	160									-40 to +150			
AH3329Q						150	175	200	125	150	180										-40 to +150		
AH3320Q						180	220	240	155	195	220											-40 to +150	
AH3321Q						235	275	295	210	250	275												-40 to +150
AH3712Q	Latch	Single, Open-Drain, Active Low	3 to 28	3	30	10	25	40	-40	-25	-10	-40 to +150	SC59, SOT23	2Q 2023									
AH3722Q																							
AH3723Q						15	30	45	-45	-30	-15		-40 to +150		SC59, SOT23, SIP-3 (-B)								
AH3724Q						20	40	60	-60	-40	-20				-40 to +150	SC59, SOT23, SIP-3							
AH3725Q						50	70	90	-90	-70	-50					-40 to +150	SOT23, SIP-3						
AH3726Q						80	110	140	-140	-110	-80						-40 to +150	SOT23, SIP-3 (-B)					
AH3727Q						110	140	170	-170	-140	-110							-40 to +150	SIP-3 (-B)				
AH3729Q						170	220	250	-250	-220	-170								-40 to +150	SOT23			

HALL SWITCHES AUTOMOTIVE 'Q' PORTFOLIO

TWO-WIRE HALL SWITCHES

The automotive-compliant AH323xQ, AH324xQ, AH327xQ, and AH328xQ, are high-voltage, high-sensitivity Two-Wire Unipolar and Latch Hall Effect switch ICs. They are designed for position and proximity sensing in automotive applications.

The AH324xQ and AH328xQ devices have integrated self-diagnostics – which monitor main device blocks, supply voltage, and temperature – with a third, lower current, output state.

This enables them, as a Safety Element out of Context (SEoC), to support ISO 26262/ASIL-B system integrations.

THE **DIODES**™ ADVANTAGE

- Automotive compliant with AEC-Q100 Grade 0 qualification, manufactured in IATF 16949 certified sites supporting PPAP documents
- Integrated diagnostics (AH324xQ/328xQ) with safe mode supports ISO 26262 ASIL compliant systems
- Wide operating voltage range
- High 8kV ESD withstand for robustness and reliability
- Industry standard SC59 and SIP-3 packages
Ease of use and placement



Part Number		Active Pole	Type	Operating Voltage (V)	Supply Current		Operating Point Bop Gauss			Release Point Brp Gauss			Temp Range (°C)	Packages
No Diagnostics	Diagnostics				"On" (mA)	"Off" (mA)	Min	Typ	Max	Min	Typ	Max		
AH3270Q	AH3280Q	Direct South	Latch	2.7 to 27	14.5	3.3	3	18	33	-33	-18	-3	-40 to +150	SC59, SIP-3
AH3271Q	AH3281Q	Direct South	Latch		14.5	6	3	18	33	-33	-18	-3		
AH3272Q	AH3282Q	Direct South	Latch		14.5	3.3	10	30	50	-50	-30	-10		
AH3231Q	AH3241Q	Inverted South	Unipolar		14.5	6	55	90	125	35	70	105		
AH3232Q	AH3242Q	Direct South	Unipolar		14.5	6	30	60	90	10	40	70		
AH3233Q	AH3243Q	Direct South	Unipolar		14.5	6	20	45	70	3	28	53		

OMNIPOLAR HALL SWITCHES

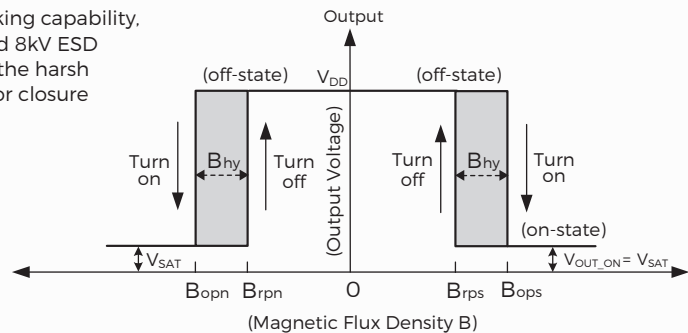
Part Number	Type	Output Type	Operating Voltage (V)	Average Supply Current (V)	Output Current (mA)	Operating Point Bop Gauss			Release Point Brp Gauss			Ambient Temperature Range (°C)	Package	Availability	
						Min	Typ	Max	Min	Typ	Max				
AH3522Q	Omnipolar	Single, Open-Drain, Active Low	3 to 28	3	30	±10	±20	±30	±2	±10	±25	-40 to +150	SOT23, SIP-3	3Q 2023	
AH3523Q						±15	±30	±45	±5	±20	±35				SOT23, SIP-3 (-B)
AH3524Q						±20	±40	±60	±10	±25	±45				

AH3522Q High-Voltage, High-Sensitivity, Omnipolar Hall Effect Switches

With its ability to detect north and south poles, the AH3522Q enables easier placement of lower strength magnets, simplifying the assembly process.

In this electric soft door closure mechanism, two Hall sensors are commonly used, one for detection of door proximity and engaging the motor to close the door, and a second for detecting the closing and latching of the door lock.

Its built-in reverse blocking capability, overvoltage clamps, and 8kV ESD makes it well suited to the harsh automotive electric door closure environment.



PRECISION TIMING AUTOMOTIVE COMPLIANT 'Q' PORTFOLIO

THE DIODES™ ADVANTAGE

- **Automotive-Compliant** – AEC qualified, manufactured in IATF 16949 certified sites, supporting PPAPs
- **Total Timing Solutions** – Frequency Control Products + IC With Very Broad Portfolio for Crystals and Oscillators Supports infotainment, clusters, telematics, ADAS, connected box, TPMS applications
- **Diodes' Precision Timing Portfolio Form Part of Chipset Manufacturers' Reference Design**
Provides a verified solution meeting the application requirements
- **Only Automotive-Compliant (AEC-Q100 Qualified) PCIe Clock Generators**



CRYSTALS

Part Number	Frequency Range (MHz)	Ambient Temperature Range (°C)	Package Type	Package Size (mm)
FWQ	16 to 66	-40 to +125	Ceramic Seam 2016	2.0 x 1.6 x 0.45
FHQ	12 to 66	-40 to +125	Ceramic Seam 2520	2.5 x 2.0 x 0.6
FLQ	8 to 66	-40 to +125	Ceramic Seam 3225	3.2 x 2.5 x 0.65
FEQ	8 to 125	-40 to +125	Ceramic Seam 5032	5.0 x 3.2 x 0.8
FYQ	8 to 125	-40 to +125	Ceramic Seam 5032	5.0 x 3.2 x 0.9
XRQ	12 to 66	-40 to +125	Ceramic Seam 3225	3.2 x 2.5 x 0.65
	16 to 66		Ceramic Seam 2520	2.5 x 2.0 x 0.6
	24 to 66		Ceramic Seam 2016	2.0 x 1.6 x 0.45

CRYSTAL OSCILLATORS

Family	Description	Supply Voltage (V)	Freq Range (MHz)	Jitter RMS (ps)	Stability (PPM)	Package Size (mm)
FDQ	CMOS Crystal Oscillator 5032	1.8, 2.5, 3.3	1 to 162	<1	20-50	5.0 x 3.2
FKQ	CMOS Crystal Oscillator 3225	1.8, 2.5, 3.3	1 to 162	<1	20-50	3.2 x 2.5
FNQ	CMOS Crystal Oscillator 7050	1.8, 2.5, 3.3	1 to 162	<1	20-50	7.0 x 5.0
HXQ11	High Temperature CMOS Crystal Oscillator 2016	3.3, 2.5, 1.8	1 to 125	<1	20-50	2.0 x 1.6
HXQ21	High Temperature CMOS Crystal Oscillator 2520	3.3, 2.5, 1.8	1 to 162	<1	20-50	2.5 x 2.0
HXQ31	High Temperature CMOS Crystal Oscillator 3225	3.3, 2.5, 1.8	1 to 162	<1	20-50	3.2 x 2.5
HXQ32	High Temperature LVDS Crystal Oscillator 3225	3.3, 2.5	25 to 162	<1	20-50	3.2 x 2.5
HXQ33	High Temperature LVPECL Crystal Oscillator 3225	3.3, 2.5	25 to 162	<1	20-50	3.2 x 2.5
HXQ51	High Temperature CMOS Crystal Oscillator 5032	3.3, 2.5, 1.8	1 to 162	<1	20-50	5.0 x 3.2
HXQ52	High Temperature LVDS Crystal Oscillator 5032	3.3, 2.5	25 to 162	<1	20-50	5.0 x 3.2
HXQ53	High Temperature LVPECL Crystal Oscillator 5032	3.3, 2.5	25 to 162	<1	20-50	5.0 x 3.2
HXQ71	High Temperature CMOS Crystal Oscillator 7050	3.3, 2.5, 1.8	1 to 162	<1	20-50	7.0 x 5.0
HXQ72	High Temperature LVDS Crystal Oscillator 7050	3.3, 2.5	25 to 162	<1	20-50	7.0 x 5.0
HXQ73	High Temperature LVPECL Crystal Oscillator 7050	3.3, 2.5	25 to 162	<1	20-50	7.0 x 5.0
KDQ	32.768kHz CMOS Crystal Oscillator 5032	3.3, 2.5, 1.8	32.768kHz	<1	20-50	5.0 x 3.2
KKQ	32.768kHz CMOS Crystal Oscillator 3225	3.3, 2.5, 1.8	32.768kHz	<1	20-50	3.2 x 2.5
KJQ	32.768kHz CMOS Crystal Oscillator 2520	3.3, 2.5, 1.8	32.768kHz	<1	20-50	2.5 x 1.8
UFQ252/22	Ultra-Low Jitter LVPECL Crystal Oscillator 2520	3.3, 2.5	100 to 212.5	0.08 to 0.09	20-100	3.2 x 2.5
UFQ253/23	Ultra-Low Jitter LVDS Crystal Oscillator 2520	3.3, 2.5	100 to 212.5	0.08 to 0.09	20-100	3.2 x 2.5
UFQ254/24	Ultra-Low Jitter HCLS Crystal Oscillator 2520	3.3, 2.5	100 to 212.5	0.08 to 0.09	20-100	3.2 x 2.5
UFQ322/32	Ultra-Low Jitter LVPECL Crystal Oscillator 3225	3.3, 2.5	100 to 212.5	0.07 to 0.09	20-100	3.2 x 2.5
UFQ323/33	Ultra-Low Jitter LVDS Crystal Oscillator 3225	3.3, 2.5	100 to 212.5	0.08 to 0.09	20-100	3.2 x 2.5
UFQ324/34	Ultra-Low Jitter HCLS Crystal Oscillator 3225	3.3, 2.5	100 to 212.5	0.08 to 0.09	20-100	3.2 x 2.5
UFQ502/52	Ultra-Low Jitter LVPECL Crystal Oscillator 5032	3.3, 2.5	100 to 212.5	0.07 to 0.09	20-100	5.0 x 3.2
UFQ503/53	Ultra-Low Jitter LVDS Crystal Oscillator 5032	3.3, 2.5	100 to 212.5	0.08 to 0.09	20-100	5.0 x 3.2
UFQ504/54	Ultra-Low Jitter HCLS Crystal Oscillator 5032	3.3, 2.5	100 to 212.5	0.08 to 0.09	20-100	5.0 x 3.2
UFQ702/72	Ultra-Low Jitter LVPECL Crystal Oscillator 7050	3.3, 2.5	100 to 212.5	0.07 to 0.09	20-100	7.0 x 5.0
UFQ703/73	Ultra-Low Jitter LVDS Crystal Oscillator 7050	3.3, 2.5	100 to 212.5	0.08 to 0.09	20-100	7.0 x 5.0
UFQ704/74	Ultra-Low Jitter HCLS Crystal Oscillator 7050	3.3, 2.5	100 to 212.5	0.08 to 0.09	20-100	7.0 x 5.0

PRECISION TIMING AUTOMOTIVE COMPLIANT 'Q' PORTFOLIO

CLOCK GENERATORS & BUFFERS

Type	Part Number	Description/Protocols	Outputs	Supply Voltage (V)	Input Type(s)	Output Type(s)	Output Frequency (MHz)	Jitter RMS (ps)	Skew (PS)	Ambient or Junction Temperature (°C)	Package
Clock Generator	PI6C557-01BQ	PCI Express 3.0, 2.0, 1.0	1	3.3	Crystal, LVCMOS	HCSL	100	1		-40 to 85	QFN3030-16
	PI6C557-03AQ	PCI Express 2.0, 1.0	2	3.3	Crystal, CMOS		100	<3	50	-40 to 85	TSSOP-16
	PI6C557-05Q	PCI Express 2.0, 1.0	4	3.3	Crystal, CMOS		100	<3	50	-40 to 85	TSSOP-20
	PI6CG182Q	PCI Express 4.0, 3.0, 2.0, 1.0	2	1.8	Crystal, CMOS	Low Power HCSL	100	<0.5	50	-40 to 105	TQFN4040-24
	PI6CG184Q	PCI Express 4.0, 3.0, 2.0, 1.0	4	1.8	Crystal, CMOS		100	<0.5	50	-40 to 105	TQFN5050-32
	PI6CG188Q	PCI Express 4.0, 3.0, 2.0, 1.0	8	1.8	Crystal, CMOS		100	<0.5	50	-40 to 105	TQFN6060-48
		PI6LC48H02Q	PCI Express 3.0, 2.0, 1.0 & Ethernet	2	3.3	Crystal, LVCMOS	HCSL	100	0.45	50	-40 to 85
Clock Buffer	PI6CB184Q	PCI Express 4.0, 3.0, 2.0, 1.0	4	1.8	HCSL	LP-HCSL	100	0.1	50	-40 to 105	TQFN5050-32
	PI6C49CB01Q	CMOS clock buffer	1	1.5V-3.3V	LVPECL, LVDS, LVHSTL, SSTL, HCSL	LVCMOS/LVTTL	250	0.1	250	-40 to 105	SO-8
	PI6C49CB02Q	Dual output CMOS clock buffer	2	1.5V-3.3V	LVCMOS/LVTTL		250	0.1	250	-40 to 105	SO-8
	PI6C49CB04AQ	Automotive 1 to 4 LVCMOS/LVTTL Fanout Buffer, OE Pin without pull up/down resistor	4	1.5V-3.3V	LVCMOS/LVTTL		250	0.1	250	-40 to 105	SO-8
	PI6C49CB04BQ	Automotive 1 to 4 LVCMOS/LVTTL Fanout Buffer, no OE	4	1.5V-3.3V	LVCMOS/LVTTL		200	0.05	250	-40 to 105	SO-8
	PI6C49CB04CQ	Automotive 1 to 4 LVCMOS/LVTTL Fanout Buffer, OE Pin with 125kΩ pull up resistor	4	1.5V-3.3V	LVCMOS/LVTTL		250	0.1	250	-40 to 105	SO-8

REAL TIME CLOCKS (RTC)

Part Number	Description	Supply Voltage (V)	Source (V)	Time Display	Alarm	Interface	Temperature Range (°C)	Package	AEC-Q100 Grade
PT7C4363BQ	Automotive RTC	1.3 to 5.5	1.3 to 5.5	24 hour	Yes	I2C	-40 to 125	SO-8	1
PT7C4563BQ	Automotive RTC	1.3 to 5.5	1.3 to 5.5	24 hour	Yes	I2C	-40 to 125	SO-8	1

REAL TIME CLOCKS COMPARISON

Item	Function	PT7C4363BQ	PT7C4563BQ
1	Oscillator	Source: Crystal: 32.768kHz	☑
		Oscillator fail detect	☑
2	Time	Time display	☑
		Century bit	-
		Time count chain enable/disable	-
3	Interrupt	Alarm interrupt	☑
		Timer interrupt output	-
4	Programmable square wave output (Hz)	1, 32, 1.024k, 32.768k	
5	Communication	2-wire I2C Bus	☑
6	Control	External clock test mode	☑
		Power-on reset override	☑

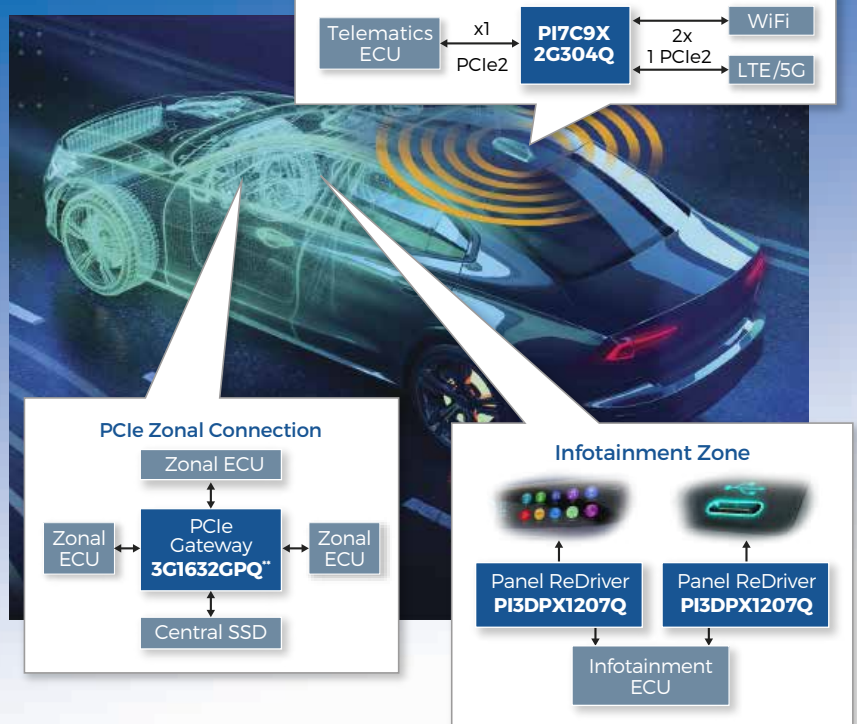
555 TIMERS

Part Number	Description	Supply Voltage V	Supply Current Output Low (mA)	Supply Current V _{CC} =5V Output High (mA)	Max Frequency (MHz)	Max Output Rise Time (Ns)	Temperature Range (°C)	Package	AEC-Q100 Grade
SE555QS-13	Automotive 555 Timer	4.5 to 15	3	2	0.1	3	-40 to 125	SO-8	1

CONNECTIVITY AUTOMOTIVE COMPLIANT 'Q' PORTFOLIO

THE DIODES™ ADVANTAGE

- Automotive-Compliant**
 AEC qualified, manufactured in IATF 16949 certified sites, supporting PPAPs
- Diodes' Serial Connectivity ICs Form Part of Chipset Manufacturers' Reference Design**
 Provides a verified solution meeting the application requirements
- Only Automotive-Compliant PCIe Packet Switch Available Today**
 Extends PCIe ports with intelligent support for infotainment, clusters, telematics, and ADAS applications
- USB Signal Switch Family**
 MUX/DeMUX for USB3.0/2.0 ports
- Single, Two, and Four-Channel USB ReDriver Family**
 Extends cable length for high-speed signals, while the four-channel option supports alt-display mode



PACKET SWITCHES

Part Number	PCIe Standard	Ports	Lanes	Power Consumption (W)	Latency (Ns)	Ambient Temperature Range (°C)	Package
PI7C9X2G304ELQ	PCIe 2.0	3	4	0.65	150	-40 to +85	QFN100100-136
PI7C9X2G304EVQ	PCIe 2.0	3	4	0.3	150	-40 to +105	QFN100100-136
PI7C9X2G304SLQ	PCIe 2.0	3	4	0.7	150	-40 to +85	128-LQFP
PI7C9X2G404ELQ	PCIe 2.0	4	4	0.65	150	-40 to +85	QFN100100-136
PI7C9X2G404EVQ	PCIe 2.0	4	4	0.3	150	-40 to +105	QFN100100-136
PI7C9X2G404SLQ	PCIe 2.0	4	4	0.7	150	-40 to +85	128-LQFP
PI7C9X3G606GPQ**	PCIe 3.0	6	6	2.5	150	-40 to +85	FC LFBGA (FCA144)
PI7C9X3G808GPQ**	PCIe 3.0	8	8	2.9	150	-40 to +85	HFCBGA150150-324
PI7C9X3G816GPQ**	PCIe 3.0	8	16	4.1	150	-40 to +85	HFCBGA190190-324
PI7C9X3G1632GP**	PCIe 3.0	16	32	5.6	150	-40 to +85	HFCBGA270270-676

PCIe SWITCHES

Part Number	Description	Differential Channels	Lanes	Type	Voltage (V)	Package
PI3DBS16222	3.3V 20Gbps 4 Channel 2x2 Exchange Switch	2	2	Crossbar	3.3	TQFN

IO EXPANDERS

Part Number	I2C Supply Voltage Range (V)	I/O Supply Voltage (V)	Single Ended Channels	Signal Type	I2C Bus speed (kHz)	IO Power Off Leakage Current (nA)	Ambient Temperature Range (°C)	Package
PI4IOE5V6416AQ	1.65 to 5.5	1.65 to 5.5	16	Single Ended	400	100	-40 to 105	TSSOP-24
PI4IOE5V6416RQ	1.65 to 5.5	1.65 to 5.5	16	Single Ended	400	-	-40 to 105	TSSOP-24
PI4IOE5V6534Q	0.8 to 3.6	1.65 to 5.5	34	Single Ended	1000	-	-40 to 105	W-QFN4565-46 /SWP

ANALOG SWITCH

Part Number	Type	Supply Voltage (V)	Single Ended Channels	On-Resistance (Ω)	Rail-To-Rail	-3dB Bandwidth	Ambient Temperature Range (°C)	Package
PI3A27518	SPDT	1.65 to 3.6	6	5	Yes	380 MHz	-40 to +85	TQFN4040-24 (ZD24)

** In Development – sampling, production expected 1Q 2023

LOGIC AND VOLTAGE TRANSLATION AUTOMOTIVE 'Q' PORTFOLIO

SINGLE GATE LOGIC

Type	Description	74LVC Min V _{CC} (V)	74AHC Min V _{CC} (V)	74AHCT Min V _{CC} (V)	All Max V _{CC} (V)	Ambient Temperature Range (°C)	Packages
1G00Q	2-Input NAND Gate	1.65	2	4.5	5.5	-40 to 125	SOT353/SOT25
1G02Q	2-Input NOR Gate	1.65	2	4.5	5.5	-40 to 125	SOT353/SOT25
1G04Q	INVERTER	1.65	2	4.5	5.5	-40 to 125	SOT353/SOT25
1G06Q	INVERTER Open-drain	1.65	2	4.5	5.5	-40 to 125	SOT353/SOT25
1G07Q	BUFFER Open-drain	1.65	2	4.5	5.5	-40 to 125	SOT353/SOT25
1G08Q	2-Input AND Gate	1.65	2	4.5	5.5	-40 to 125	SOT353/SOT25
1G09Q	2-Input AND Gate Open-drain	-	2	-	5.5	-40 to 125	SOT353/SOT25
1G125Q	3-state BUFFER OE LOW	1.65	2	4.5	5.5	-40 to 125	SOT353/SOT25
1G126Q	3-state BUFFER OE HIGH	1.65	2	4.5	5.5	-40 to 125	SOT353/SOT25
1G14Q	Schmitt Trigger INVERTER	1.65	2	4.5	5.5	-40 to 125	SOT353/SOT25
1G17Q	Schmitt Trigger BUFFER	1.65	2	4.5	5.5	-40 to 125	SOT353/SOT25
1G32Q	2-Input OR Gate	1.65	2	4.5	5.5	-40 to 125	SOT353/SOT25
1G34Q	BUFFER	1.65	-	-	5.5	-40 to 125	SOT353/SOT25
1G86Q	2-Input XOR Gate	1.65	2	4.5	5.5	-40 to 125	SOT353/SOT25

AUTO-DIRECTION VOLTAGE TRANSLATORS

Part Number	Translation		Auto Direction Sensing	Level Shift	Max Signal Rate	Prop Delay (Ns)	Bits Needed	Ambient Temperature (°C)	Package
	From (V)	To (V)							
PI4ULS5V108Q	0.95 to 3.3	1.8 to 5	Yes	Bidirectional	100MHz	2.2	8	-40 to 125	TSSOP-20
PI4ULS5V202Q	1.2 to 5.5	1.2 to 5.5	Yes	Bidirectional	20Mb/s	20	2	-40 to 125	MSOP-8
PI4ULS3V304AQ	0.9 to 2	1.65 to 3.6	Yes	Bidirectional	140MHz	3	4	-40 to 125	U-QFN1720-12

QUALITY AND ENVIRONMENTAL STANDARDS

- IATF 16949
Quality Management System
Process-based/customer-focused
- ISO 14001 Environmental
Management System
- VDA6.3 Compliant Wafer and
Assembly Facilities
- RoHS-Compliant
All reliability and environmental
information available at diodes.com.





CORPORATE HEADQUARTERS AND AMERICAS SALES OFFICE

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