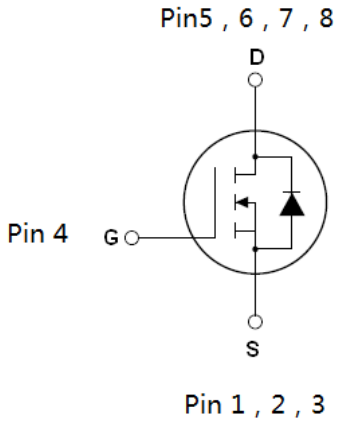
RECTRON SEMICONDUCTOR
TECHNICAL SPECIFICATION

RM60N30DF

N-Channel Enhancement Mode Power MOSFET

Description

The RM60N30DF uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge . This device is suitable for use as a load switch or in PWM applications.



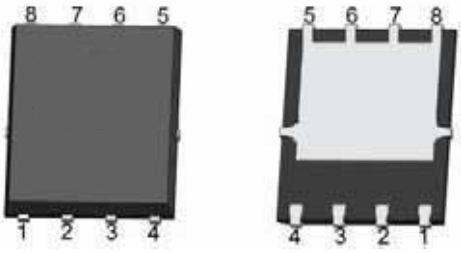
General Features

- V_{DS} = 30V,I_D = 58A
  $R_{DS(ON)}$ < 14mΩ @ V_{GS}=4.5V
  $R_{DS(ON)}$ < 8.5mΩ @ V_{GS}=10V
- High Power and current handing capability
- Lead free product is acquired
- Surface mount package

Application

- PWM applications
- Load switch
- Power management
- Halogen-free

Schematic diagram



Top View **Bottom View**

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
A3004	RM60N30DF	DFN5X6-8L	Ø330mm	12mm	2500 units

Absolute Maximum Ratings (T_C=25℃unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	58	A
Drain Current-Continuous(T_C=100℃)	I_D (100℃)	38	A
Pulsed Drain Current	I_{DM}	115	A
Maximum Power Dissipation	P_D	46	W
Single pulse avalanche energy (Note 5)	E_{AS}	57.8	mJ
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 150	℃

Thermal Resistance,Junction-to-Case (Note 2)	$R_{\theta JC}$	2.7	℃/W

Electrical Characteristics (T_A=25℃unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=-250μA	30	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=24V,V_{GS}=0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250u A,	1.2	1.5	2.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D= 30 A	-	6.5	8.5	mΩ
		V_{GS}=4.5V, I_D= 15A	-	11	14	mΩ
Dynamic Characteristics (Note4)						
Input Capacitance	C_{lss}	V_{DS}=15V,V_{GS}=0V, F=1.0MHz	-	1317	1844	PF
Output Capacitance	C_{oss}		-	163	228	PF
Reverse Transfer Capacitance	C_{rss}		-	131	183	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=15V, ID=15A, V_{GS}=10V,R_{GEN}=3.3Ω	-	4.6	9.2	nS
Turn-on Rise Time	t_r		-	12.2	22	nS
Turn-Off Delay Time	$t_{d(off)}$		-	26.6	53	nS
Turn-Off Fall Time	t_f		-	8	16	nS
Total Gate Charge	Q_g	V_{DS} =15V,I_D=15A,V_{GS}=4.5V	-	12.6	17.6	nC
Gate-Source Charge	Q_{gs}		-	4.2	5.9	nC
Gate-Drain Charge	Q_{gd}		-	5.1	7.1	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V,I_S=1A	-	-	1.0	V
Diode Forward Current (Note 2)	I_S	V_G =V_D =0V ,Force Current	-	-	58	A
Pulsed Source Current	I_{Sm}	V_G =V_D=0V ,Force Current	-	-	115	A

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production

RATING AND CHARACTERISTICS CURVES (RM60N30DF)

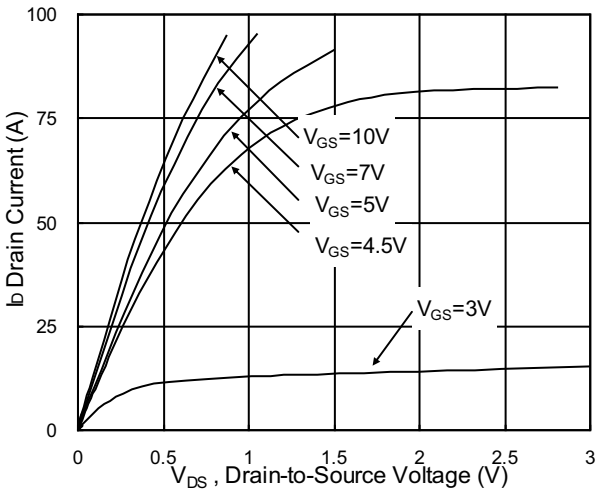


Fig.1 Typical Output Characteristics

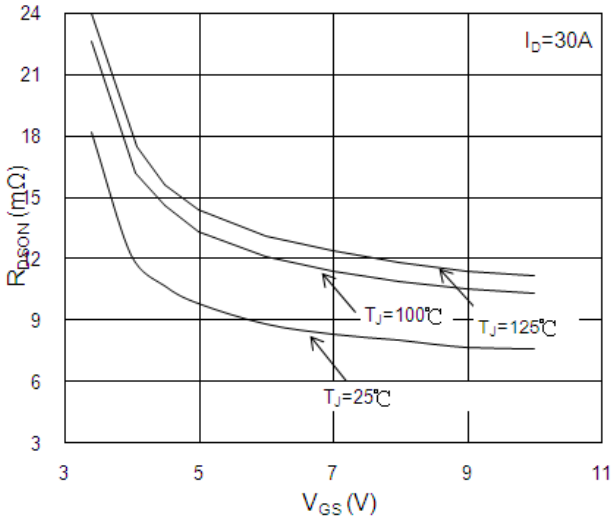


Fig.2 On-Resistance vs. Gate-Source

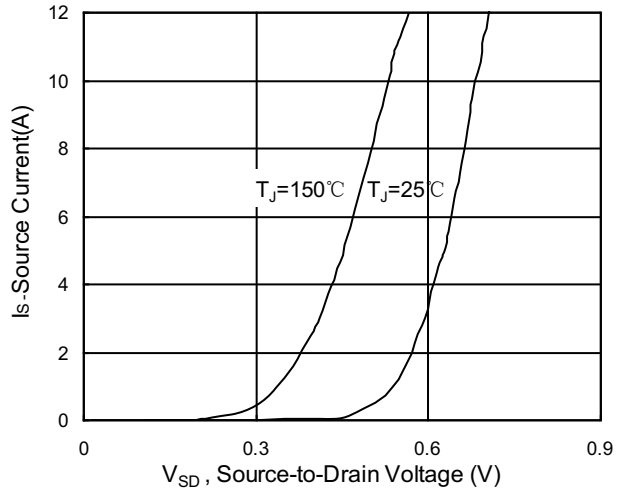


Fig.3 Forward Characteristics of reverse

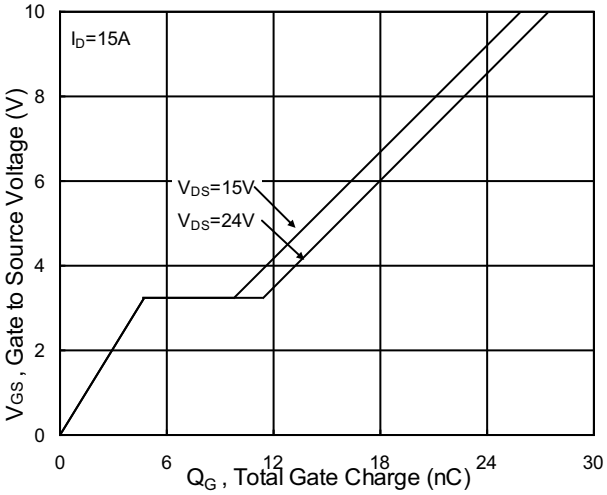


Fig.4 Gate-Charge Characteristics

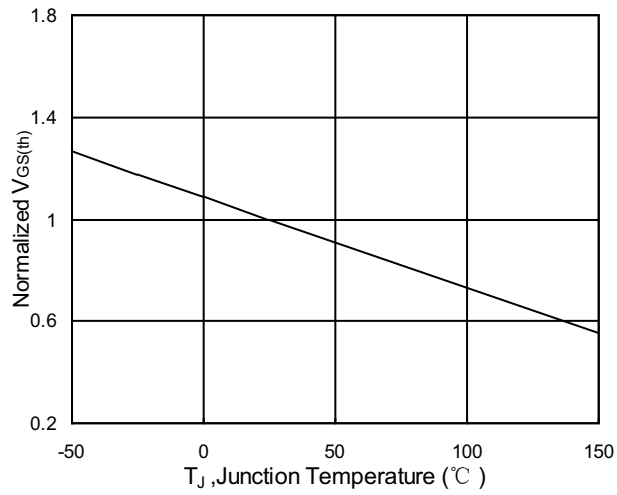


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

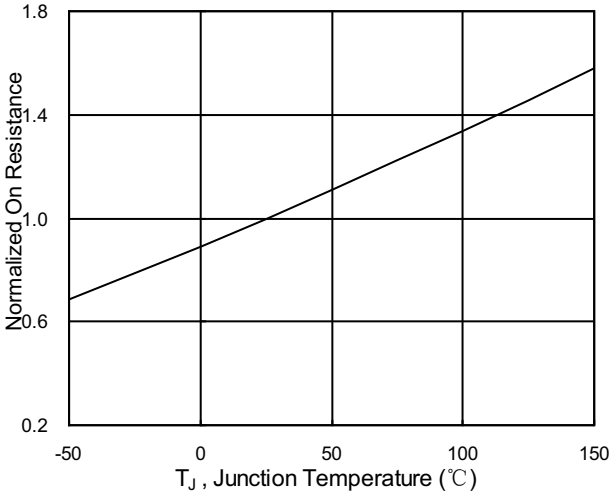


Fig.6 Normalized R_{DSON} vs. T_J

RATING AND CHARACTERISTICS CURVES (RM60N30DF)

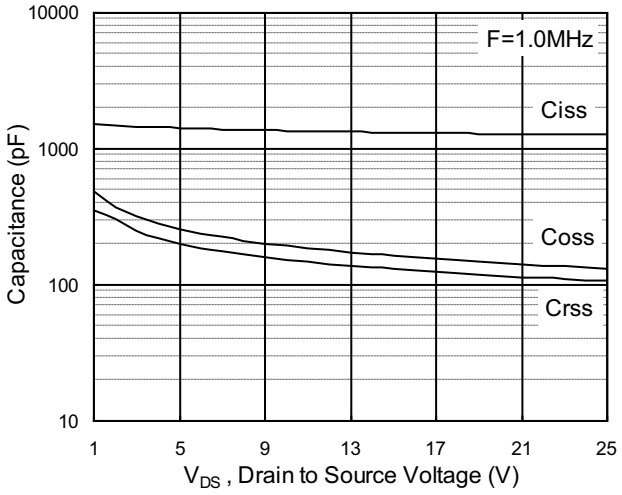


Fig.7 Capacitance

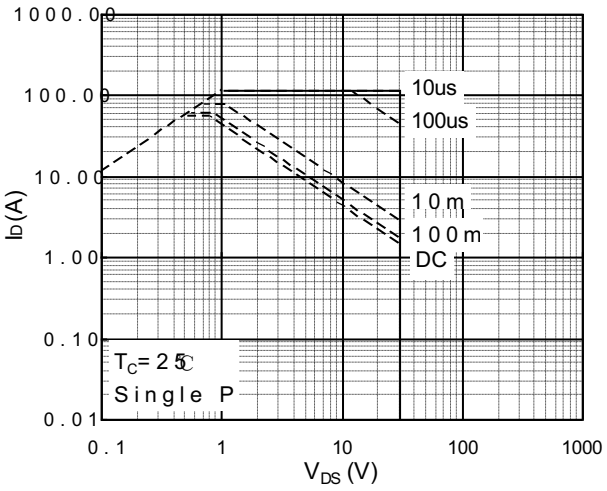


Fig.8 Safe Operating Area

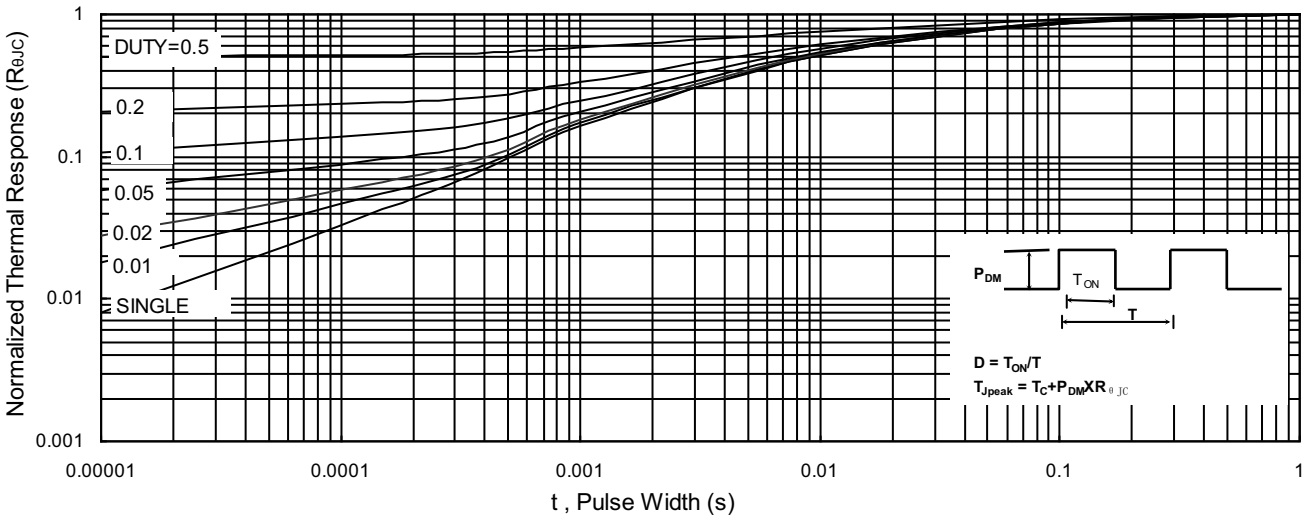


Fig.9 Normalized Maximum Transient Thermal Impedance

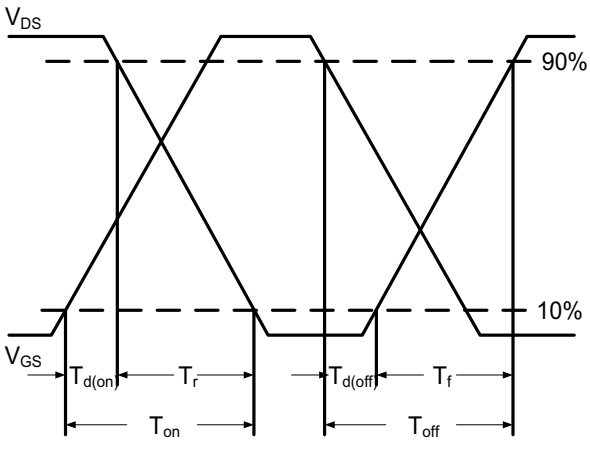


Fig.10 Switching Time Waveform

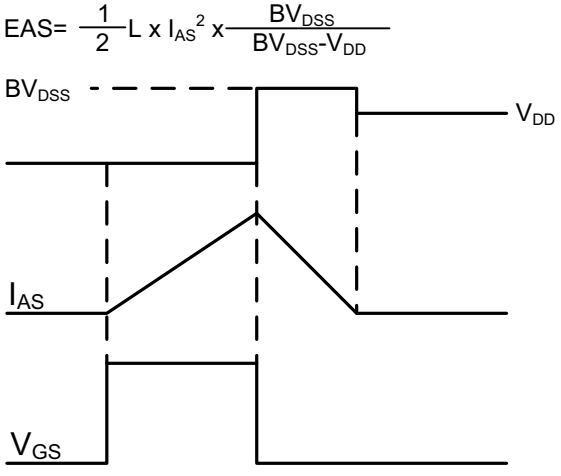
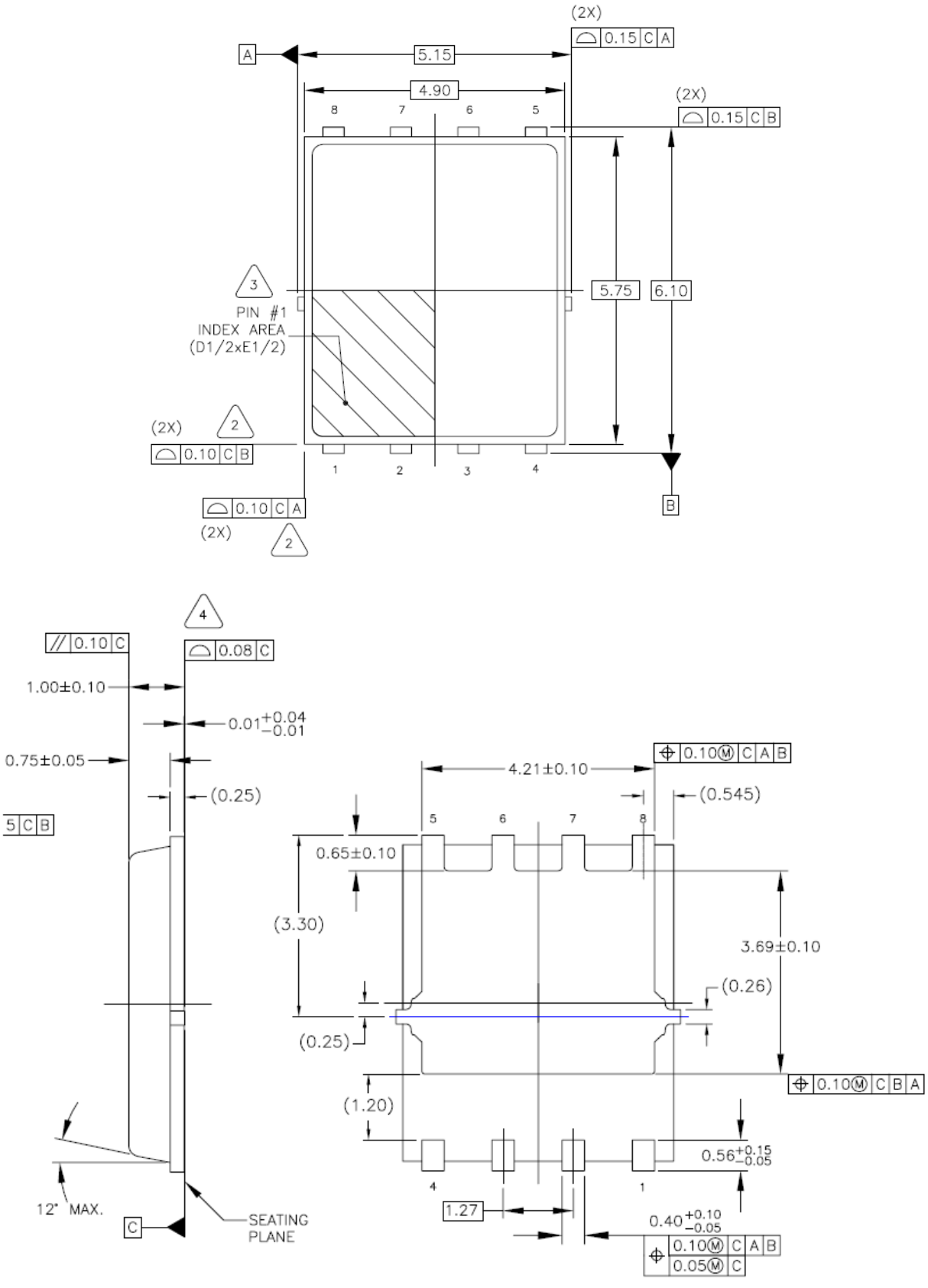
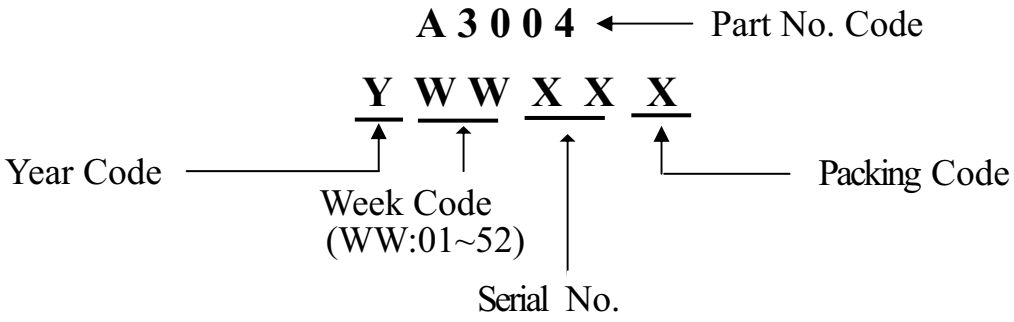


Fig.11 Unclamped Inductive Switching Waveform

DFN5X6-8L Package Information



Marking on the body



Package	Tube (pcs/tube)	Tube (pcs/inner box)	Tube (pcs/cartoon)	Tape&Reel (pcs/reel)	Tape&Reel (pcs/inner box)	Tape&Reel (pcs/cartoon)
DFN5x6/DFN3x3	100	10,000	100,000	2,500	5,000	40,000
DFN1006	——	——	——	10,000	10,000	400,000
SOP-8	100	10,000	100,000	4,000	4,000	20,000
TSSOP-8	100	32,000	128,000	3,000	6,000	48,000
SOT-23-3L	——	——	——	3,000	30,000	120,000
SOT-23-6L	——	——	——	3,000	30,000	120,000
SOT-23(6R)	——	——	——	3,000	30,000	120,000
SOT-363	——	——	——	3,000	30,000	120,000
SOT-523	——	——	——	3,000	30,000	120,000
SOT223	——	——	——	2,500	2,500	20,000
TO-220	50	1,000	5,000	——	——	——
TO-220F	50	1,000	10,000	——	——	——
TO-247	30	300	1,200	——	——	——
TO-251	80	4,000	40,000	——	——	——
TO-251S(4R)	80	4,000	40,000	——	——	——
TO-252-2L(4R)	80	4,000	40,000	2,500	2,500	25,000
TO-263-2L	50	1,000	10,000	800	800	8,000
TO-3P	30	300	3,000	——	——	——
TO-92	——	——	——	1,000(袋装)	10,000	100,000

Revise History

Rev	Content	Data
0	New Release	2018-11-15

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