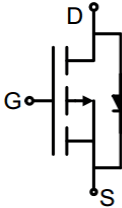
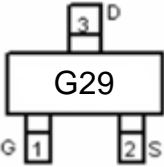
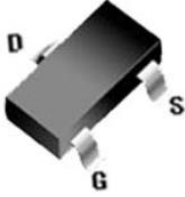


## P-Channel Enhancement Mode Power MOSFET

<p><b>Description</b></p> <p>The G29 uses advanced trench technology to provide excellent <math>R_{DS(ON)}</math>, low gate charge. It can be used in a wide variety of applications.</p> <p><b>General Features</b></p> <ul style="list-style-type: none"> <li>• <math>V_{DS}</math> -15V</li> <li>• <math>I_D</math> (at <math>V_{GS} = -12V</math>) -4.1A</li> <li>• <math>R_{DS(ON)}</math> (at <math>V_{GS} = -4.5V</math>) &lt; 30m<math>\Omega</math></li> <li>• <math>R_{DS(ON)}</math> (at <math>V_{GS} = -2.5V</math>) &lt; 40m<math>\Omega</math></li> <li>• <math>R_{DS(ON)}</math> (at <math>V_{GS} = -1.8V</math>) &lt; 56m<math>\Omega</math></li> <li>• RoHS Compliant</li> </ul> <p><b>Application</b></p> <ul style="list-style-type: none"> <li>• Power switch</li> <li>• DC/DC converters</li> </ul>		 <p>Schematic diagram</p>  <p>Marking and pin assignment</p>  <p>SOT-23</p>	
<b>Device</b>	<b>Package</b>	<b>Marking</b>	<b>Packaging</b>
G29	SOT-23	G29	3000pcs/Reel

### Absolute Maximum Ratings $T_C = 25^\circ C$ , unless otherwise noted

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	-15	V
Continuous Drain Current	$I_D$	-4.1	A
Pulsed Drain Current (note1)	$I_{DM}$	-20	A
Gate-Source Voltage	$V_{GS}$	$\pm 12$	V
Power Dissipation	$P_D$	1.05	W
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 To 150	$^\circ C$

### Thermal Resistance

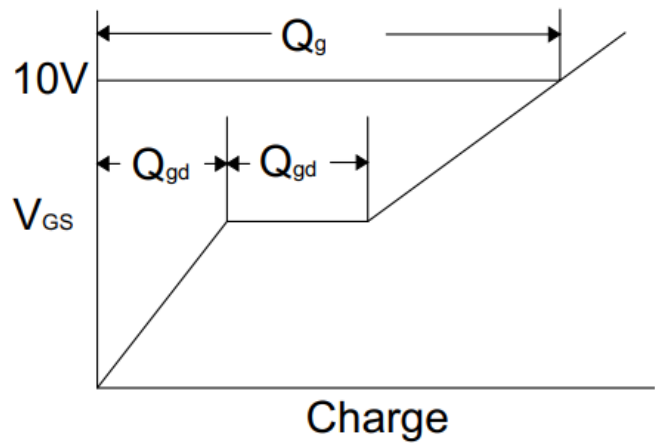
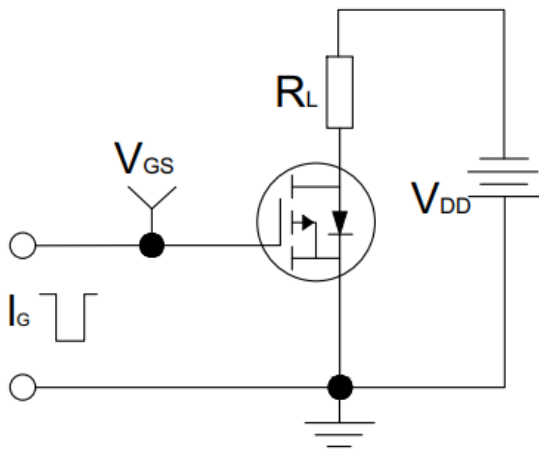
Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Ambient	$R_{thJA}$	120	$^\circ C/W$

Specifications $T_J = 25^\circ\text{C}$ , unless otherwise noted						
Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
<b>Static Parameters</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-15	--	--	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -15V, V_{GS} = 0V$	--	--	-1	$\mu A$
Gate-Source Leakage	$I_{GSS}$	$V_{GS} = \pm 12V$	--	--	$\pm 100$	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-0.4	-0.55	-0.9	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = -4.5V, I_D = -4A$	--	24	30	m $\Omega$
		$V_{GS} = -2.5V, I_D = -3A$	--	32	40	
		$V_{GS} = -1.8V, I_D = -2A$	--	40	56	
Forward Transconductance	$g_{FS}$	$V_{DS} = -5V, I_D = -2A$	5	--	--	S
<b>Dynamic Parameters</b>						
Input Capacitance	$C_{iss}$	$V_{GS} = 0V,$ $V_{DS} = -4V,$ $f = 1.0MHz$	--	740	--	pF
Output Capacitance	$C_{oss}$		--	290	--	
Reverse Transfer Capacitance	$C_{rss}$		--	190	--	
Total Gate Charge	$Q_g$	$V_{DD} = -4V,$ $I_D = -4.1A,$ $V_{GS} = -4.5V$	--	7.8	--	nC
Gate-Source Charge	$Q_{gs}$		--	1.2	--	
Gate-Drain Charge	$Q_{gd}$		--	1.6	--	
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = -4V,$ $I_D = -3.3A,$ $R_G = 1\Omega$	--	12	--	ns
Turn-on Rise Time	$t_r$		--	35	--	
Turn-off Delay Time	$t_{d(off)}$		--	30	--	
Turn-off Fall Time	$t_f$		--	10	--	
<b>Drain-Source Body Diode Characteristics</b>						
Continuous Body Diode Current	$I_S$	$T_C = 25^\circ\text{C}$	--	--	-4.1	A
Body Diode Voltage	$V_{SD}$	$T_J = 25^\circ\text{C}, I_{SD} = -1.6A, V_{GS} = 0V$	--	--	-1.2	V

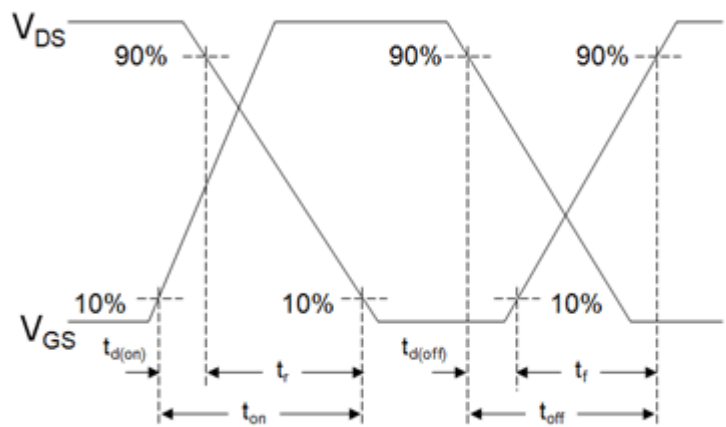
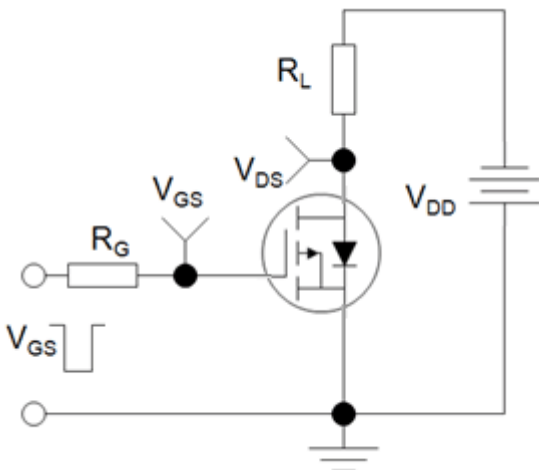
**Notes**

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. Identical low side and high side switch with identical  $R_G$

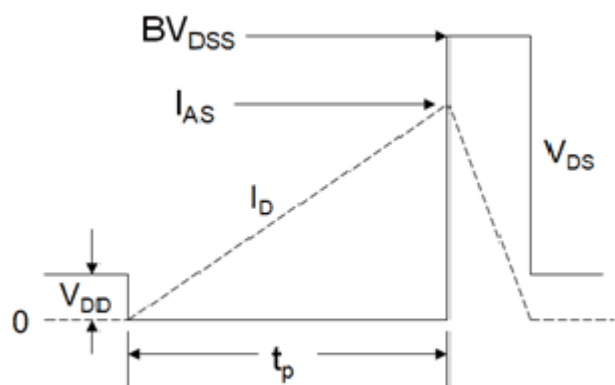
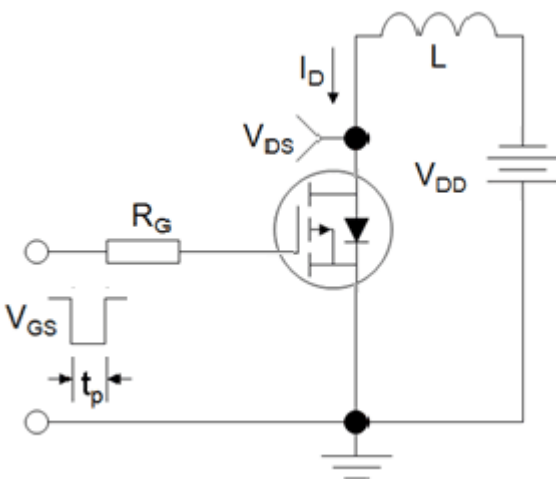
Gate Charge Test Circuit



Switch Time Test Circuit



EAS Test Circuit



Typical Characteristics  $T_J = 25^\circ\text{C}$ , unless otherwise noted

Figure 1. Output Characteristics

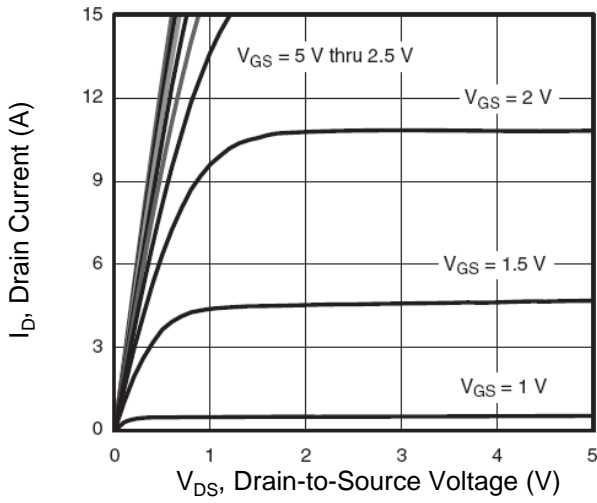


Figure 2. Transfer Characteristics

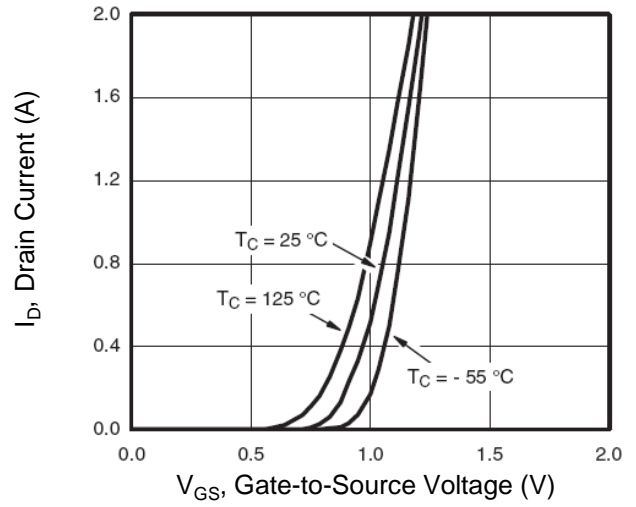


Figure 3. Gate Charge

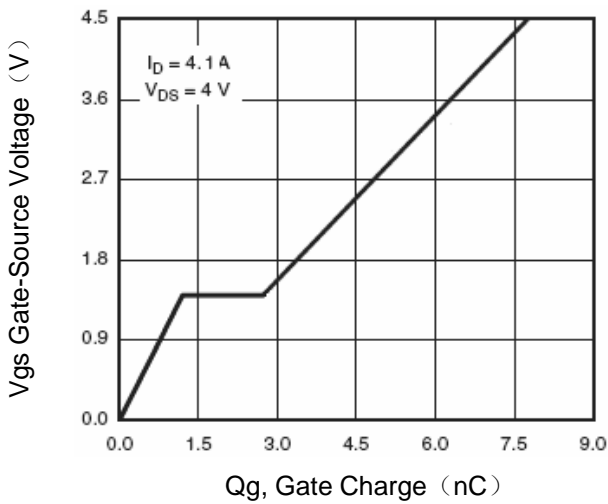


Figure 4. Drain Source On Resistance

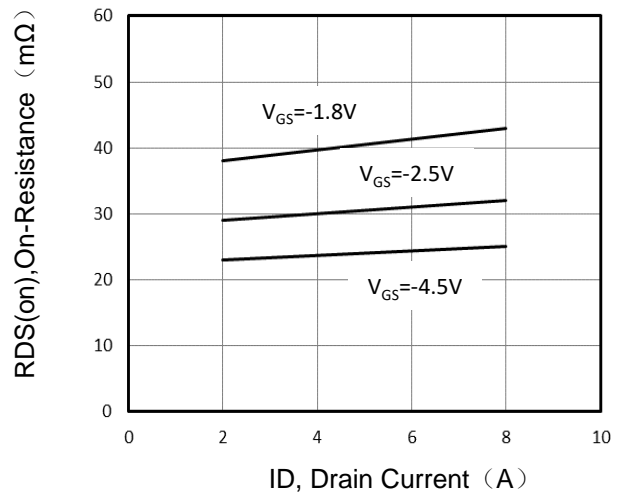


Figure 5. Capacitance

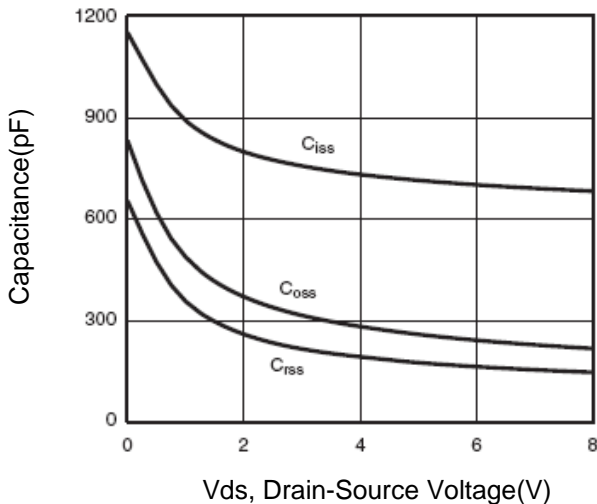
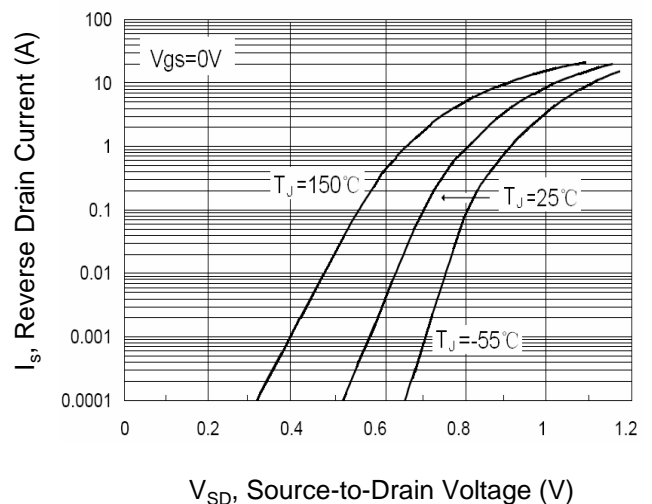


Figure 6. Source-Drain Diode Forward



Typical Characteristics  $T_J = 25^\circ\text{C}$ , unless otherwise noted

Figure 7. Drain-Source On-Resistance

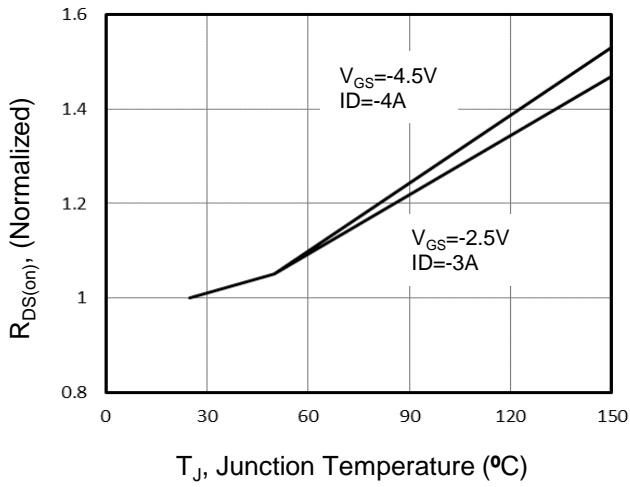


Figure 8. Safe Operation Area

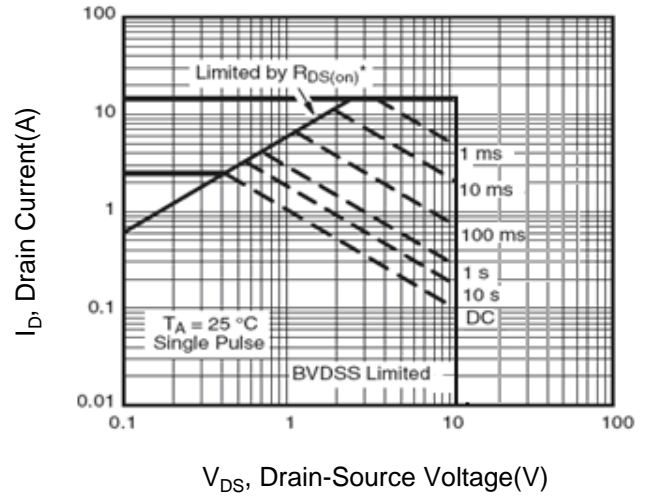
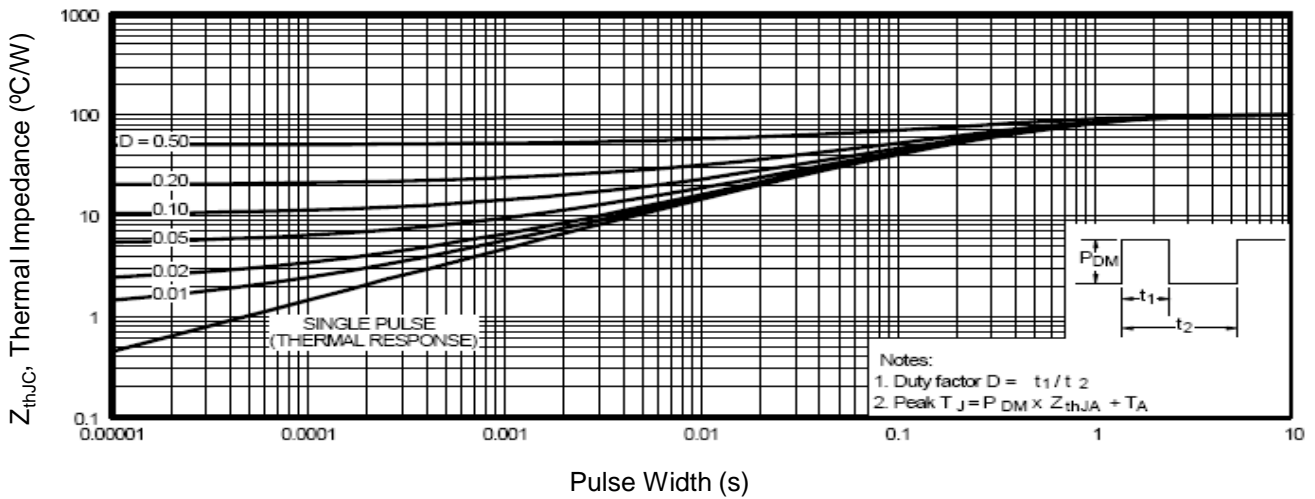
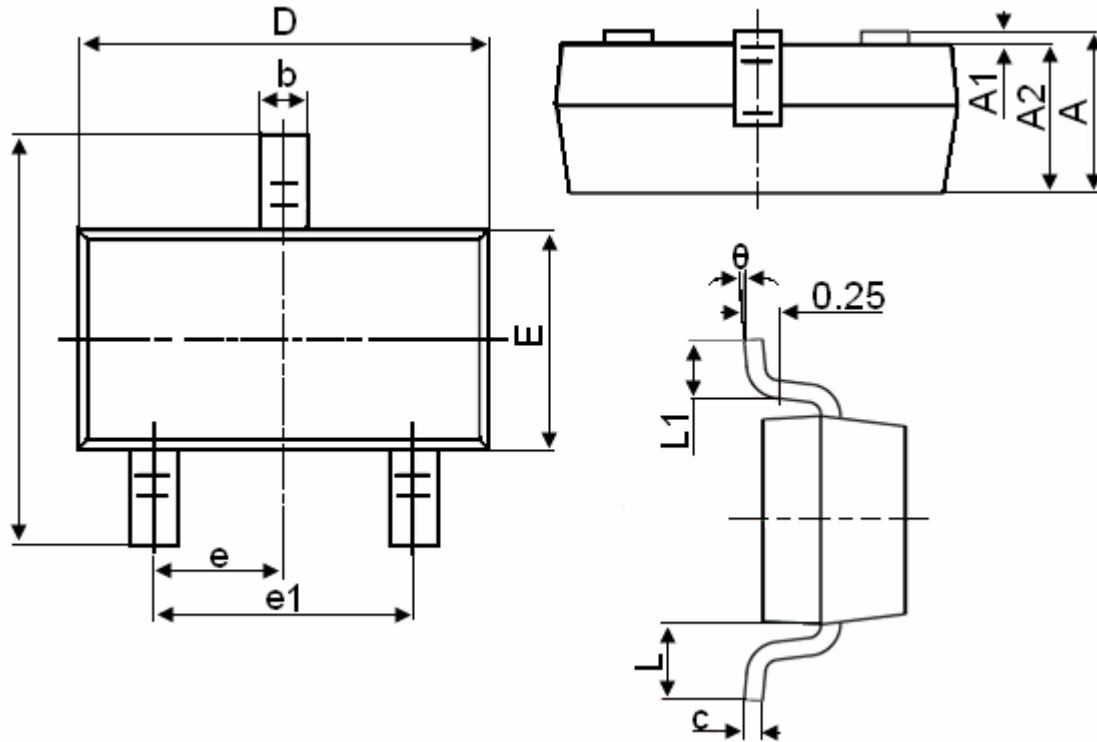


Figure 9. Normalized Maximum Transient Thermal Impedance



SOT-23 Package Information



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
$\theta$	0°	8°