

**Description**

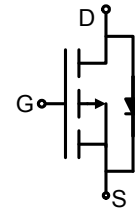
The G29 uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a load switch or in PWM applications.

**General Features**

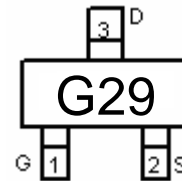
- $V_{DS} = -18V, I_D = -5.8A$   
 $R_{DS(ON)} = 36m\Omega @ V_{GS} = -2.5V$  (Typ)  
 $R_{DS(ON)} = 29m\Omega @ V_{GS} = -4.5V$  (Typ)
- High Power and current handing capability
- Lead free product is acquired
- Surface Mount Package

**Application**

- PWM applications
- Load switch
- Power management



Schematic diagram



Marking and pin Assignment



SOT-23 top view

**Absolute Maximum Ratings (TA=25°C unless otherwise noted)**

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	$V_{DS}$	-18	V
Gate-Source Voltage	$V_{GS}$	±12	V
Drain Current -Continuous	$I_D$	-5.8	A
Drain Current -Pulsed <sup>(Note 1)</sup>	$I_{DM}$	-15	A
Maximum Power Dissipation	$P_D$	1.7	W
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 To 150	°C

**Thermal Characteristic**

Thermal Resistance, Junction-to-Ambient <sup>(Note 2)</sup>	$R_{\theta JA}$	74	°C/W
---	-----------------	----	------

**Electrical Characteristics (TA=25°C unless otherwise noted)**

Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>Off Characteristics</b>						

Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-	-18	-	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-20V, V_{GS}=0V$	-	-	-1	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 8V, V_{DS}=0V$	-	-	$\pm 100$	nA
<b>On Characteristics</b> <sup>(Note 3)</sup>						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.45	-0.7	-1.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=-4.5V, I_D=-4.1A$	-	29	40	m $\Omega$
		$V_{GS}=-2.5V, I_D=-3A$	-	36	50	
Forward Transconductance	$g_{FS}$	$V_{DS}=-5V, I_D=-3.5A$	-	8.5	-	S
<b>Dynamic Characteristics</b> <sup>(Note 4)</sup>						
Input Capacitance	$C_{ISS}$	$V_{DS}=-4V, V_{GS}=0V,$ $F=1.0MHz$	-	740	-	PF
Output Capacitance	$C_{OSS}$		-	290	-	PF
Reverse Transfer Capacitance	$C_{RSS}$		-	190	-	PF
<b>Switching Characteristics</b> <sup>(Note 4)</sup>						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=-4V, I_D=-3.3A,$ $R_L=-1.2\Omega, V_{GEN}=-4.5V, R_g=1\Omega$	-	12	-	nS
Turn-on Rise Time	$t_r$		-	35	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	30	-	nS
Turn-Off Fall Time	$t_f$		-	10	-	nS
Total Gate Charge	$Q_g$	$V_{DS}=-4V, I_D=-4.1A, V_{GS}=-4.5V$	-	7.8	-	nC
Gate-Source Charge	$Q_{gs}$		-	1.2	-	nC
Gate-Drain Charge	$Q_{gd}$		-	1.6	-	nC
<b>Drain-Source Diode Characteristics</b>						
Diode Forward Voltage <sup>(Note 3)</sup>	$V_{SD}$	$V_{GS}=0V, I_S=-1.6A$	-	-	-1.2	V
Diode Forward Current <sup>(Note 2)</sup>	$I_S$		-	-	1.6	A

**Notes:**

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

Typical Electrical and Thermal Characteristics



Figure 1: Switching Test Circuit



Figure 2: Switching Waveforms

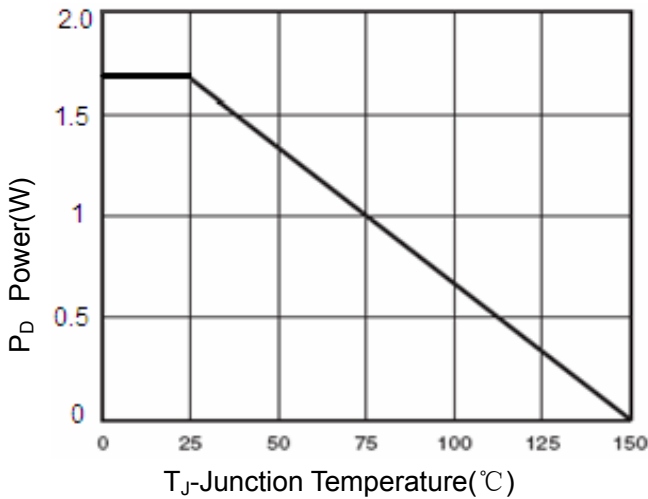


Figure 3 Power Dissipation

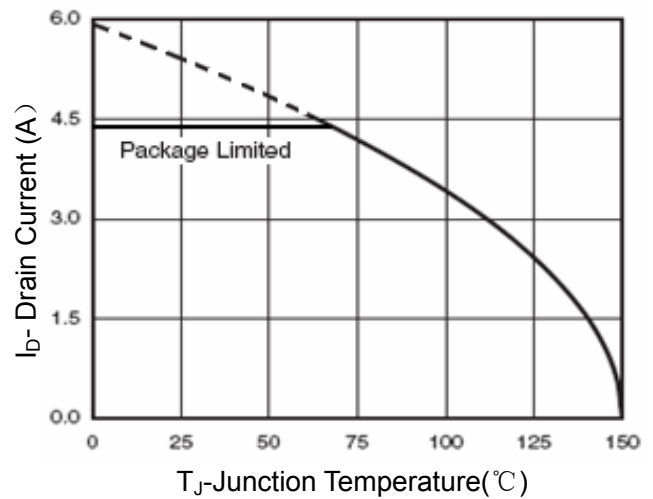


Figure 4 Drain Current

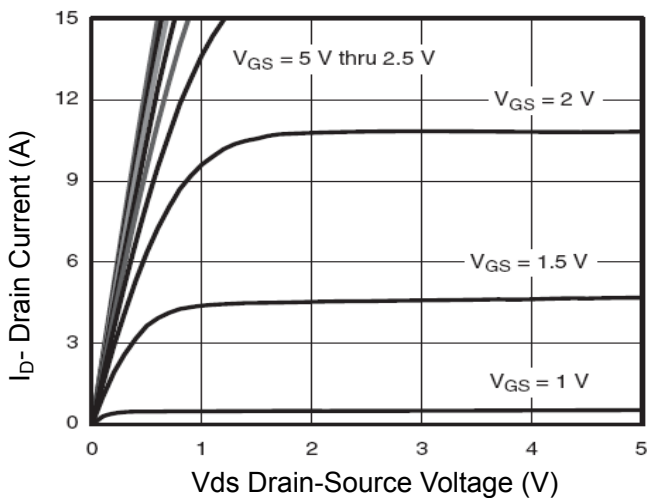


Figure 5 Output Characteristics

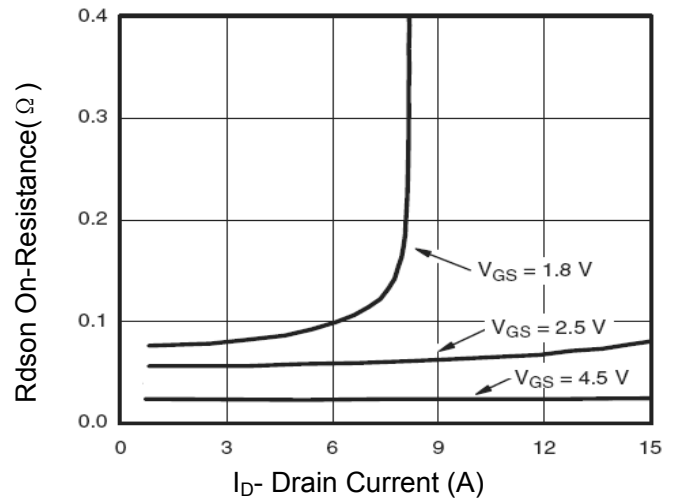
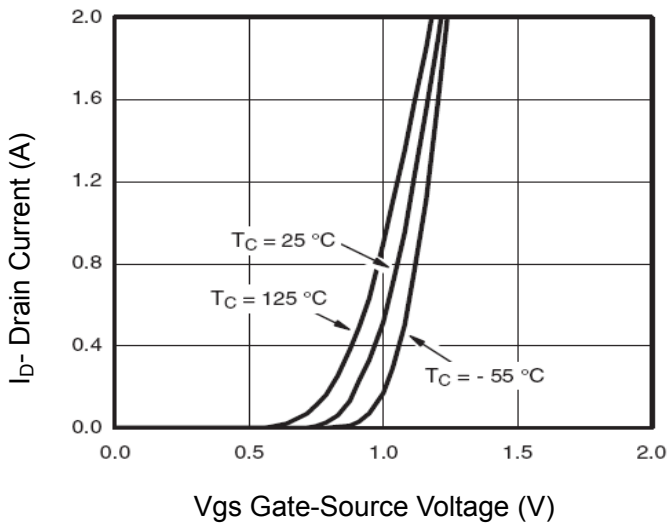
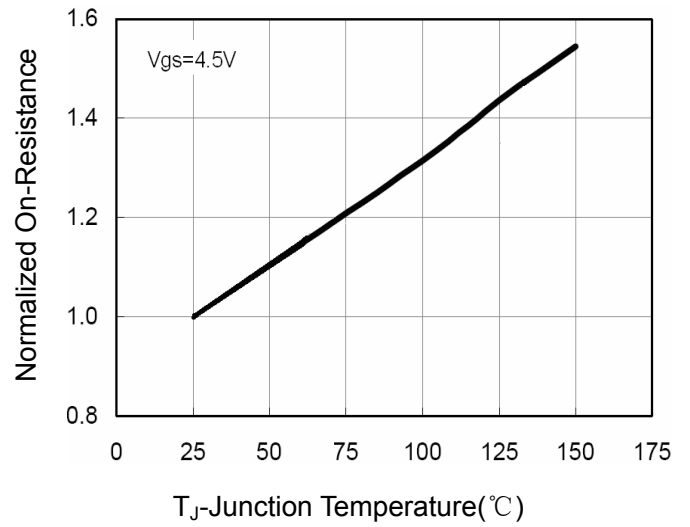


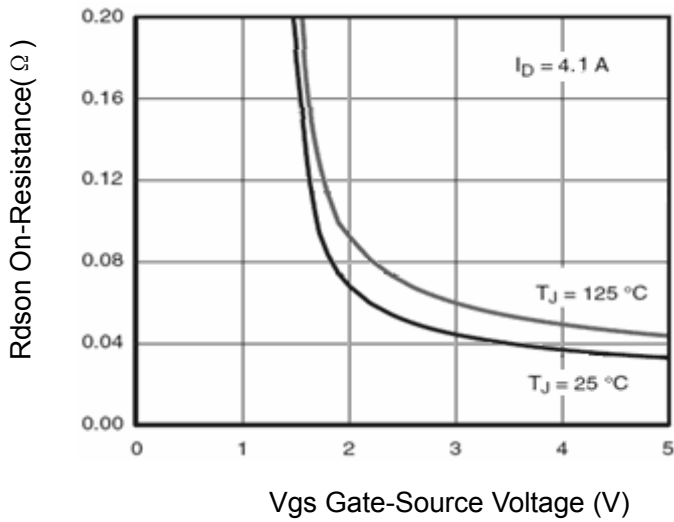
Figure 6 Drain-Source On-Resistance



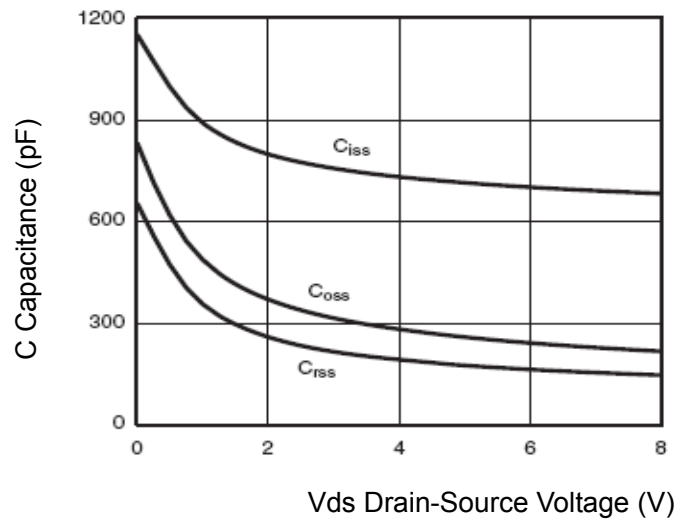
Vgs Gate-Source Voltage (V)  
**Figure 7 Transfer Characteristics**



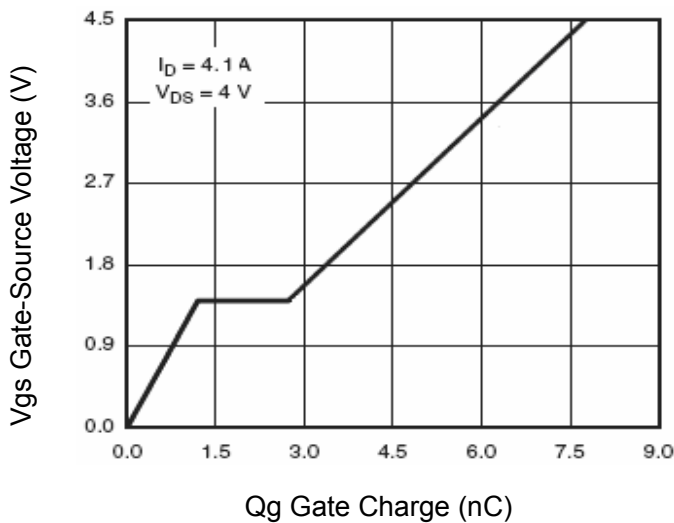
$T_J$ -Junction Temperature( $^\circ\text{C}$ )  
**Figure 8 Drain-Source On-Resistance**



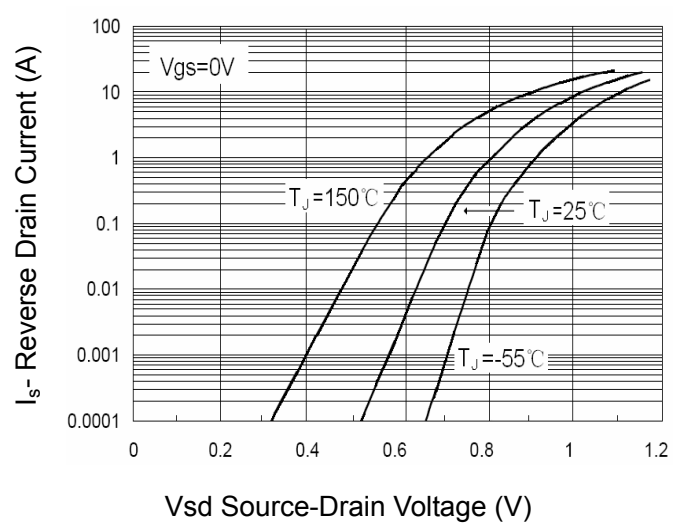
Vgs Gate-Source Voltage (V)  
**Figure 9 Rdson vs Vgs**



Vds Drain-Source Voltage (V)  
**Figure 10 Capacitance vs Vds**



Qg Gate Charge (nC)  
**Figure 11 Gate Charge**



Vsd Source-Drain Voltage (V)  
**Figure 12 Source- Drain Diode Forward**

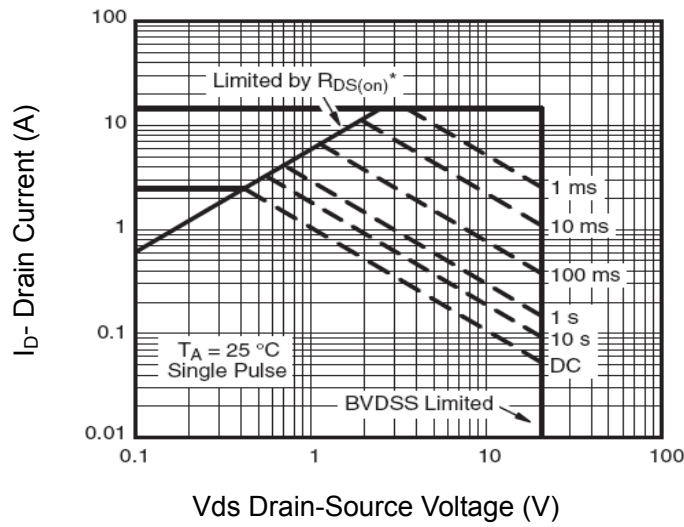


Figure 13 Safe Operation Area

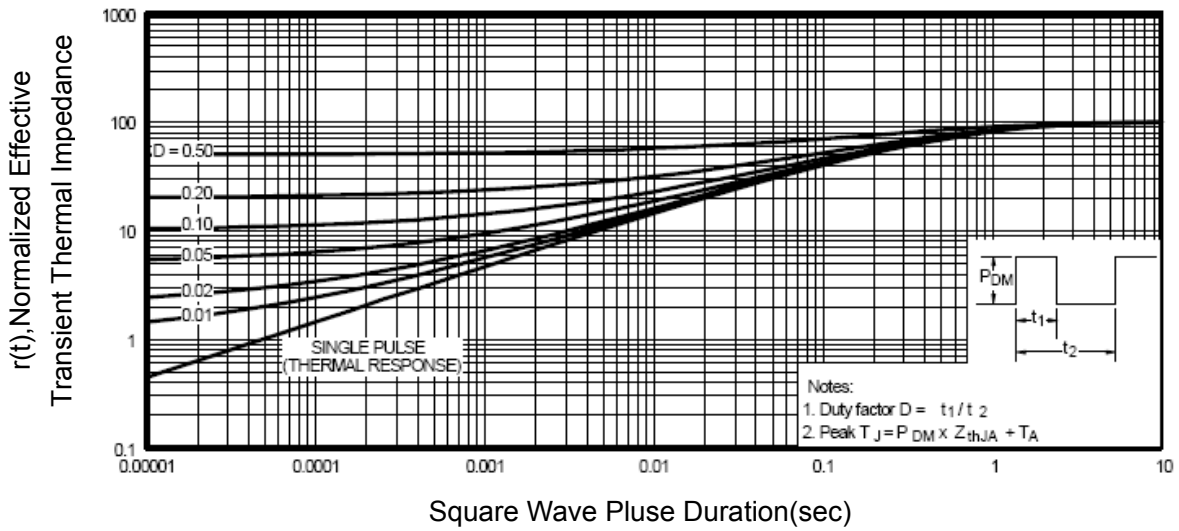


Figure 14 Normalized Maximum Transient Thermal Impedance