

## General Description

The G1005 uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a load switch or in PWM applications.

## General Features

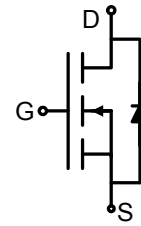
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$V_{DSS}$	$R_{DS(ON)}$ @10V (Typ)	$I_D$
100V	123m $\Omega$	5 A

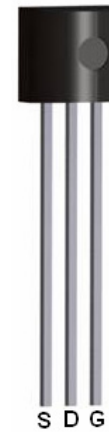
- High Power and current handling capability
- RoHS Compliant
- Surface Mount Package

## Application

- PWM applications
- Load switch
- Power management



Schematic diagram



TO-92

## Ordering Information

Part Number	Marking	Case	Packaging
G1005	G1005	TO-92	1000pcs/Carton

Table 1. Absolute Maximum Ratings ( $T_A=25^{\circ}\text{C}$ )

Symbol	Parameter	Value	Unit
$V_{DS}$	Drain-Source Voltage ( $V_{GS}=0V$ )	100	V
$V_{GS}$	Gate-Source Voltage ( $V_{DS}=0V$ )	$\pm 20$	V
$I_D$	Drain Current-Continuous( $T_c=25^{\circ}\text{C}$ )	5	A
	Drain Current-Continuous( $T_c=100^{\circ}\text{C}$ )	3.1	A
$I_{DM (pluse)}$	Drain Current-Continuous@ Current-Pulsed (Note 1)	20	A
$P_D$	Maximum Power Dissipation	9.3	W
$T_J, T_{STG}$	Operating Junction and Storage Temperature Range	-55 To 150	$^{\circ}\text{C}$

Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature

Table 2. Thermal Characteristic

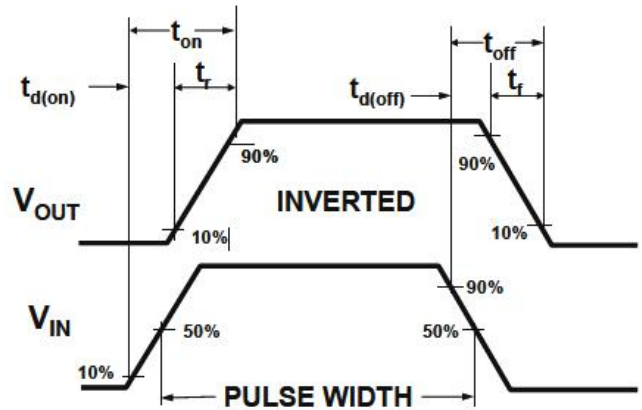
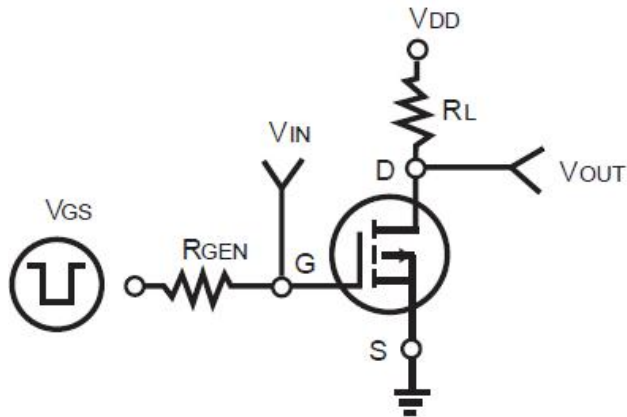
Symbol	Parameter	Typ	Value	Unit
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	-	13.5	$^{\circ}\text{C/W}$

Table 3. Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>On/Off States</b>						
B <sub>V</sub> DSS	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V I <sub>D</sub> =250μA	100			V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =100V, V <sub>GS</sub> =0V			0.9	μA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V			±100	nA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.3	1.9	2.5	V
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> = 3A		123	180	mΩ
<b>Dynamic Characteristics</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1.0MHz		690		pF
C <sub>oss</sub>	Output Capacitance			120		pF
C <sub>rss</sub>	Reverse Transfer Capacitance			90		pF
<b>Switching Times</b>						
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DD</sub> =15V, I <sub>D</sub> =1A, R <sub>L</sub> =15Ω V <sub>GS</sub> =10V, R <sub>G</sub> =2.5Ω		11		nS
t <sub>r</sub>	Turn-on Rise Time			7.4		nS
t <sub>d(off)</sub>	Turn-Off Delay Time			35		nS
t <sub>f</sub>	Turn-Off Fall Time			9.1		nS
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =15V, I <sub>D</sub> =5A V <sub>GS</sub> =10V		15.5		nC
Q <sub>gs</sub>	Gate-Source Charge			3.2		nC
Q <sub>gd</sub>	Gate-Drain Charge			4.7		nC
<b>Source-Drain Diode Characteristics</b>						
I <sub>SD</sub>	Source-Drain Current(Body Diode)				5	A
V <sub>SD</sub>	Forward on Voltage(Notes 1)	V <sub>GS</sub> =0V, I <sub>S</sub> =3A			1	V

Notes 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

### Switch Time Test Circuit and Switching Waveforms:



### TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS (Curves)

Figure1. Output Characteristics

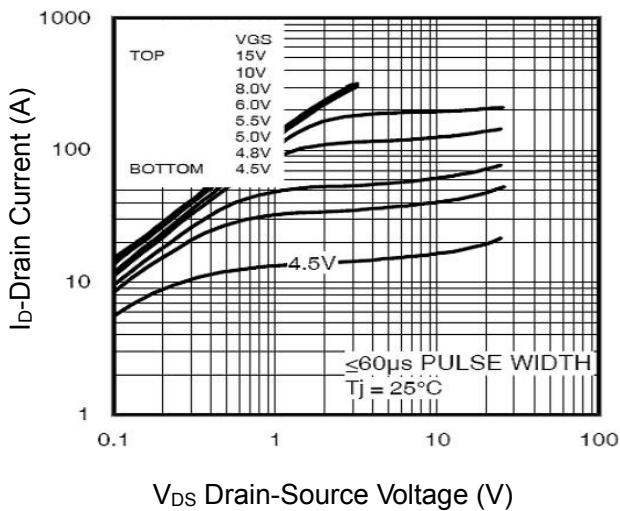


Figure2. Transfer Characteristics

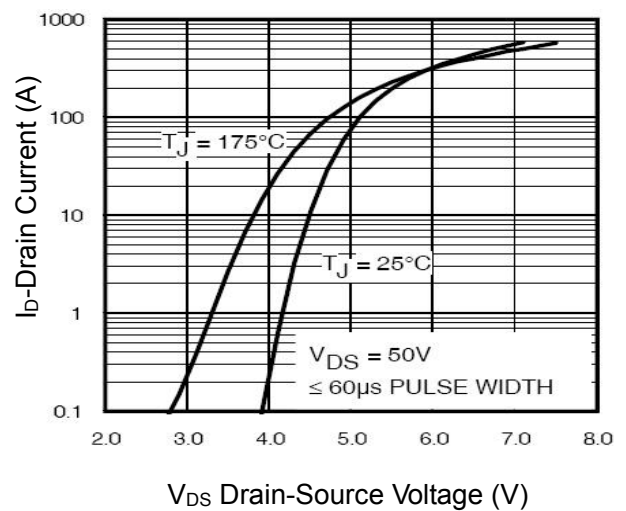


Figure3. BVDS vs Junction Temperature

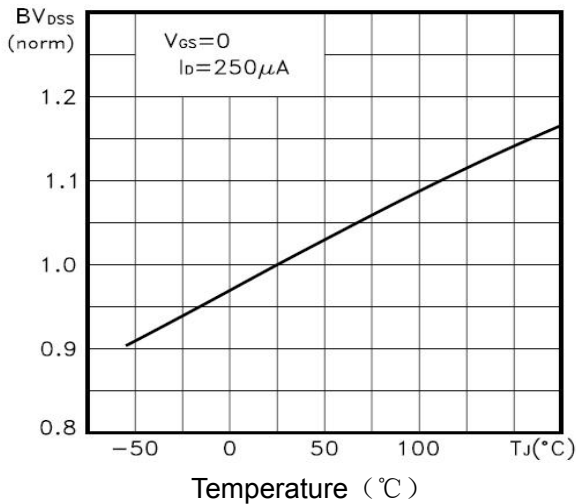


Figure4. ID vs Junction Temperature

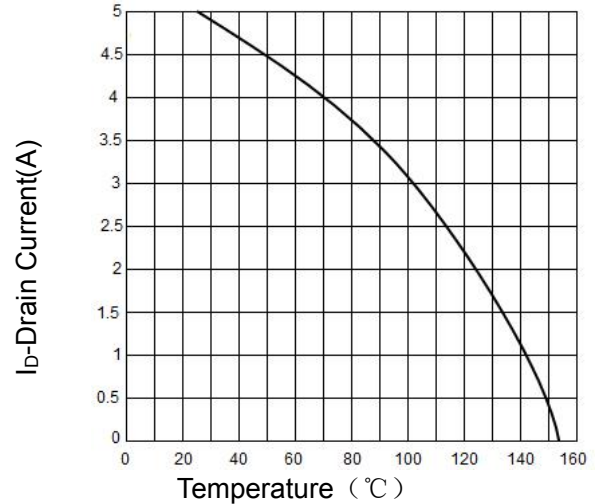


Figure5. VGS(th) vs Junction Temperature

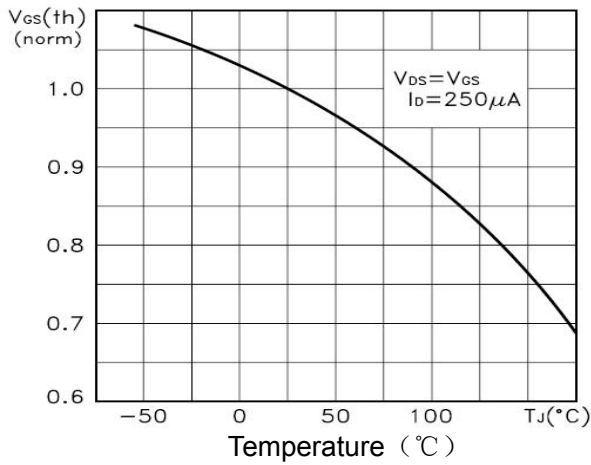


Figure6. Rds(on) Vs Junction Temperature

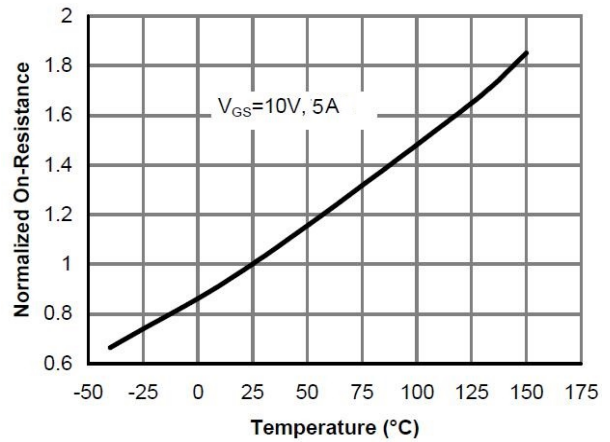


Figure7. Gate Charge

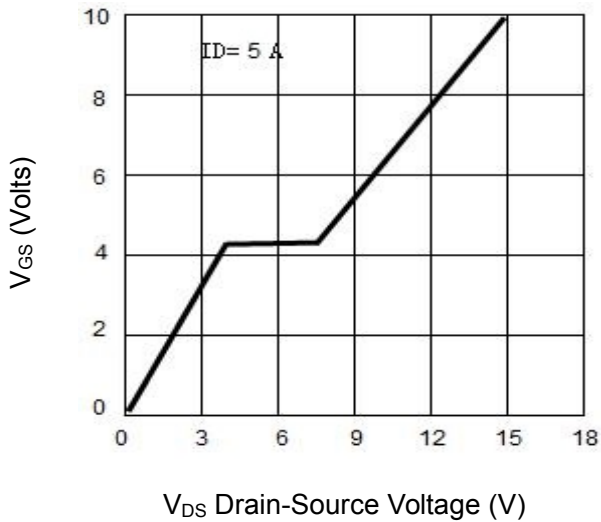


Figure8. Capacitance vs Vds

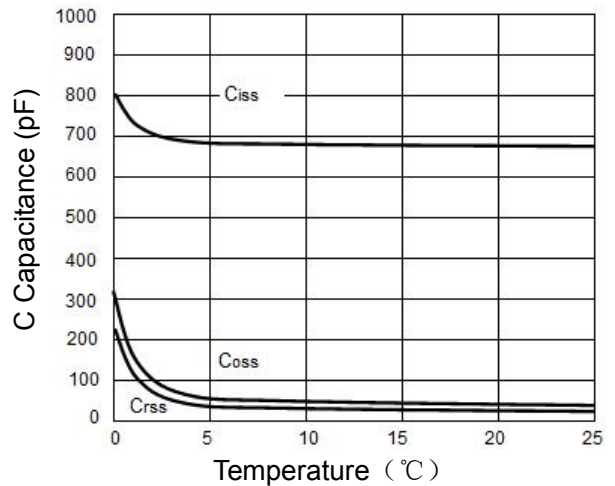


Figure9. Source- Drain Diode Forward

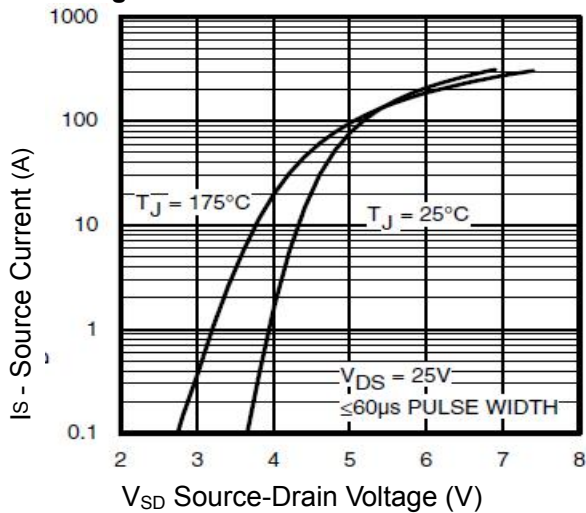


Figure10. Safe Operation Area

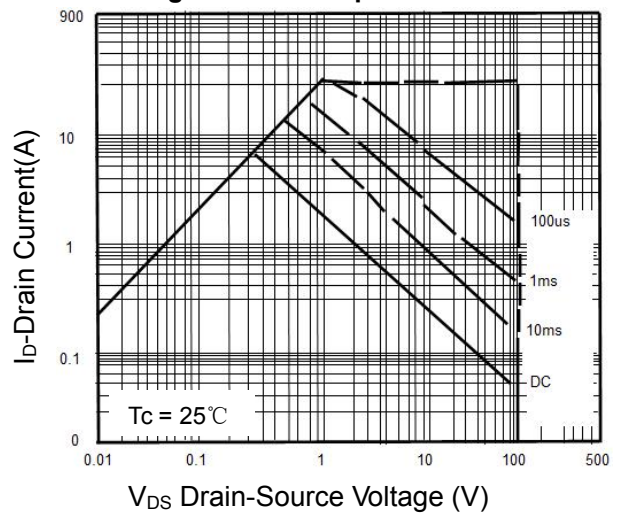
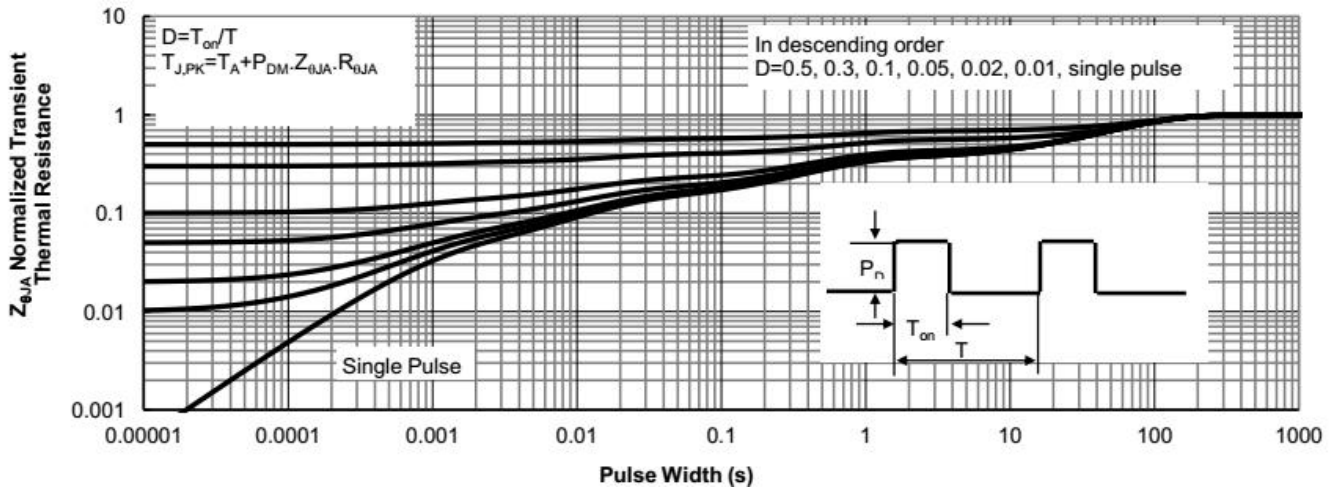
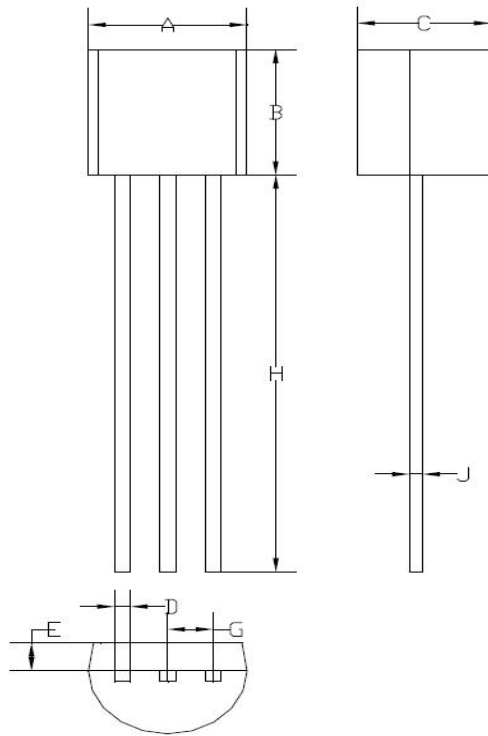


Figure11. Normalized Maximum Transient Thermal Impedance



**TO-92 Package information**



TO-92			
Dim	MIN	NOM	MAX
A	4.59	4.60	-
B	4.58	4.60	4.62
C	3.50	3.55	3.60
D	2.50	2.55	2.60
E	-	1.25	1.30
G	1.24	1.27	1.30
H	14.28	14.30	14.32
J	0.38		
All Dimensions in mm			