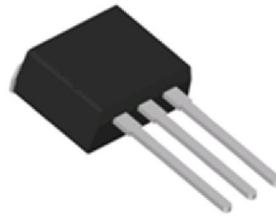


Main Product Characteristics

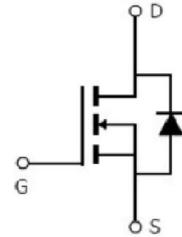
V_{DSS}	800V
$R_{DS(on)}$	2.2 Ω (typ.)
I_D	5.5A



TO-262



Marking and Pin Assignment



Schematic Diagram

Features and Benefits

- Advanced MOSFET process technology
- Special designed for PWM, load switching and general purpose applications
- Ultra low on-resistance with low gate charge
- Fast switching and reverse body recovery
- 150°C operating temperature
- Lead free product



Description

It utilizes the latest processing techniques to achieve the high cell density and reduces the on-resistance with high repetitive avalanche rating. These features combine to make this design an extremely efficient and reliable device for use in power switching application and a wide variety of other applications.

Absolute Max Rating

Symbol	Parameter	Max.	Units
$I_D @ TC = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$ ^①	5.5	A
$I_D @ TC = 100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$ ^①	3.2	
I_{DM}	Pulsed Drain Current ^②	22	
$P_D @ TC = 25^\circ C$	Power Dissipation ^③	145	W
	Linear Derating Factor	1.16	W/°C
V_{DS}	Drain-Source Voltage	800	V
V_{GS}	Gate-to-Source Voltage	± 30	V
E_{AS}	Single Pulse Avalanche Energy @ L=33.5mH	339	mJ
I_{AS}	Avalanche Current @ L=33.5mH	4.5	A
$T_J \quad T_{STG}$	Operating Junction and Storage Temperature Range	-55 to +150	°C

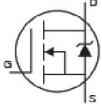
Thermal Resistance

Symbol	Characteristics	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case ^③	—	0.86	$^{\circ}C/W$
$R_{\theta JA}$	Junction-to-ambient ($t \leq 10s$) ^④	—	62.5	$^{\circ}C/W$
	Junction-to-Ambient (PCB mounted, steady-state) ^④	—	40	$^{\circ}C/W$

Electrical Characteristics @ $T_A=25^{\circ}C$ unless otherwise specified

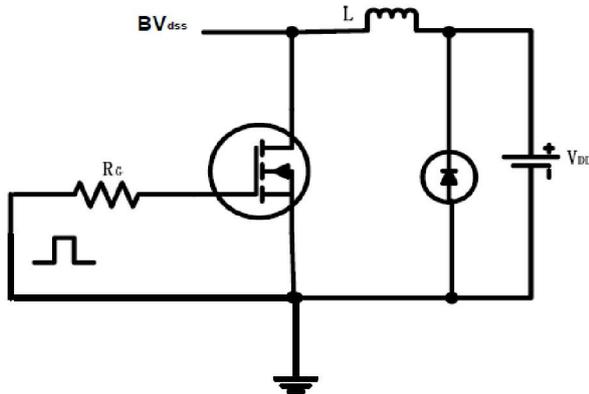
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	800	—	—	V	$V_{GS} = 0V, I_D = 250\mu A$
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	2.2	2.7	Ω	$V_{GS}=10V, I_D = 2.5A$ $T_J = 125^{\circ}C$
		—	5.2	—		
$V_{GS(th)}$	Gate threshold voltage	2	—	4	V	$V_{DS} = V_{GS}, I_D = 250\mu A$ $T_J = 125^{\circ}C$
		—	1.9	—		
I_{DSS}	Drain-to-Source leakage current	—	—	1	μA	$V_{DS} = 800V, V_{GS} = 0V$ $T_J = 125^{\circ}C$
		—	—	50		
I_{GSS}	Gate-to-Source forward leakage	—	—	100	nA	$V_{GS} = 30V$ $V_{GS} = -30V$
		—	—	-100		
Q_g	Total gate charge	—	14	—	nC	$I_D = 5.5A,$ $V_{DS}=100V,$ $V_{GS} = 10V$
Q_{gs}	Gate-to-Source charge	—	4.9	—		
Q_{gd}	Gate-to-Drain("Miller") charge	—	4.6	—		
$t_{d(on)}$	Turn-on delay time	—	14	—	ns	$V_{GS}=10V, V_{DS}=415V,$ $R_L=75\Omega,$ $R_{GEN}=25\Omega$ $I_D=5.5A$
t_r	Rise time	—	27	—		
$t_{d(off)}$	Turn-Off delay time	—	37	—		
t_f	Fall time	—	25	—		
C_{iss}	Input capacitance	—	700	—	pF	$V_{GS} = 0V$ $V_{DS} = 25V$ $f = 1MHz$
C_{oss}	Output capacitance	—	76	—		
C_{rss}	Reverse transfer capacitance	—	3.9	—		

Source-Drain Ratings and Characteristics

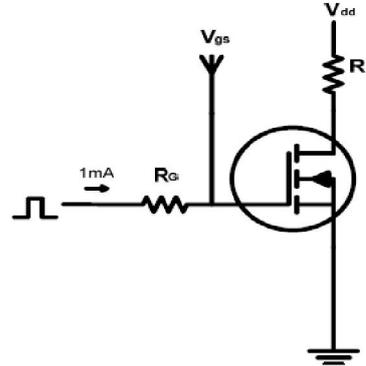
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	5.5	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode)	—	—	22	A	
V_{SD}	Diode Forward Voltage	—	0.87	1.4	V	$I_S=5A, V_{GS}=0V$
t_{rr}	Reverse Recovery Time	—	1029	—	ns	$T_J = 25^{\circ}C, I_F = 5.5A,$
Q_{rr}	Reverse Recovery Charge	—	3835	—	nC	$di/dt = 100A/\mu s$

Test Circuits and Waveforms

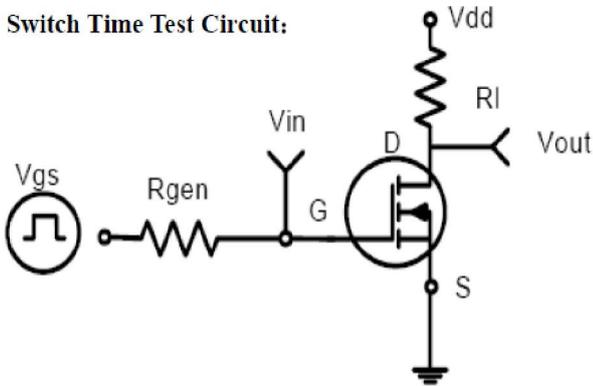
EAS test circuits:



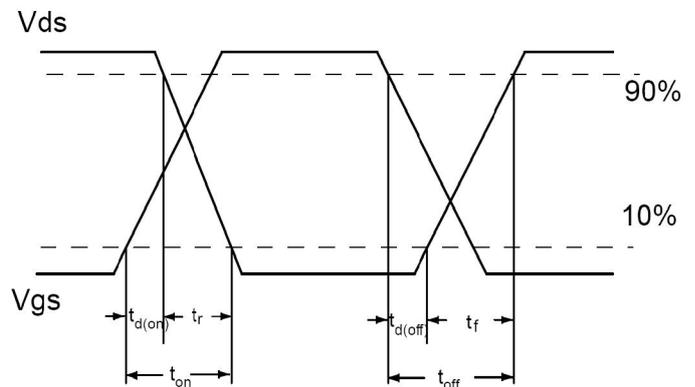
Gate charge test circuit:



Switch Time Test Circuit:



Switch Waveforms:



Notes:

- ① Calculated continuous current based on maximum allowable junction temperature.
- ② Repetitive rating; pulse width limited by max. junction temperature.
- ③ The power dissipation PD is based on max. junction temperature, using junction-to-case thermal resistance.
- ④ The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ\text{C}$

Typical Electrical and Thermal Characteristics

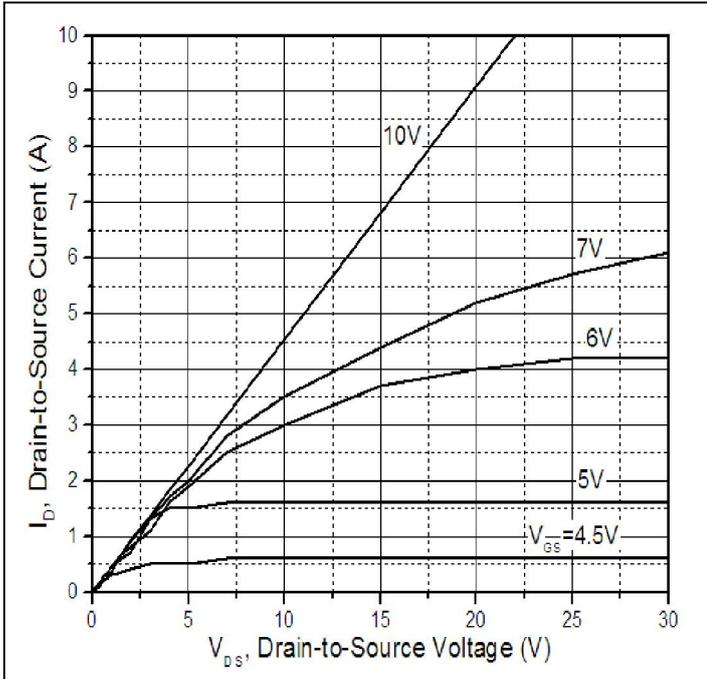


Figure 1: Typical Output Characteristics

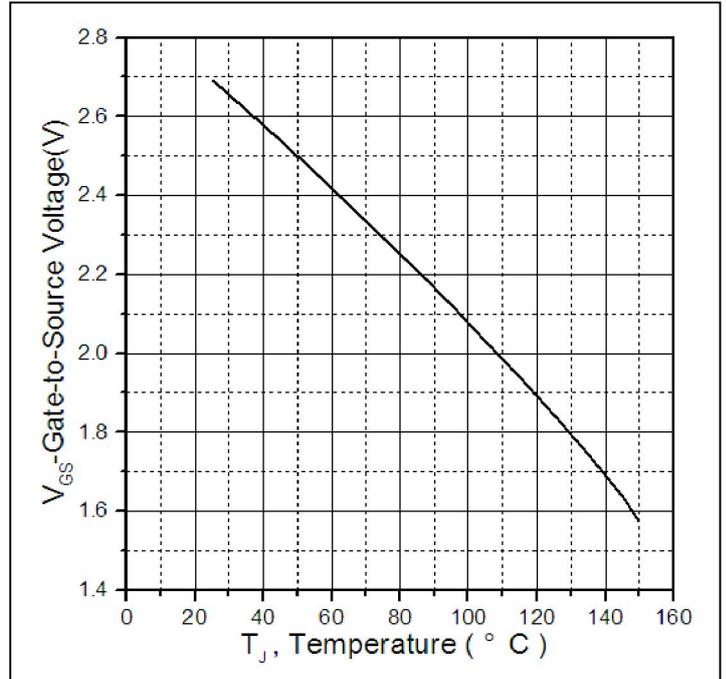


Figure 2: Gate to source cut-off voltage

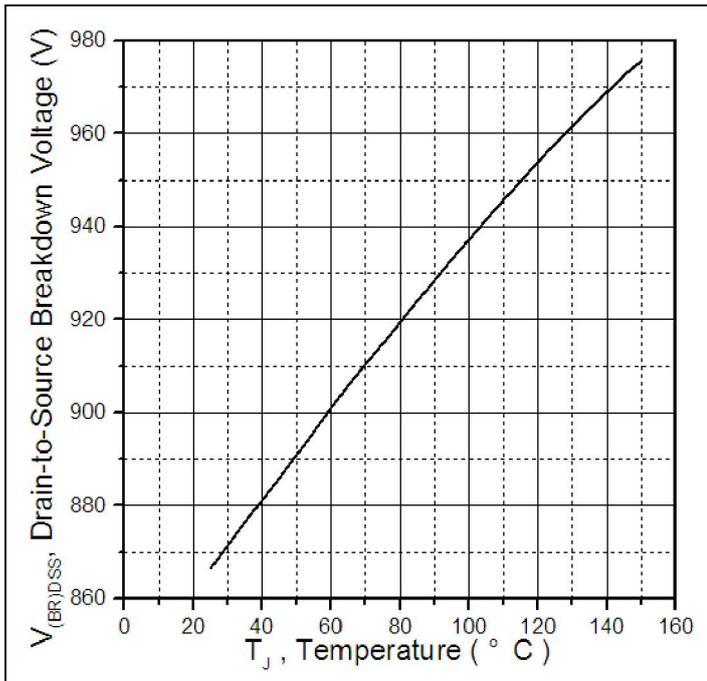


Figure 3: Drain-to-Source Breakdown Voltage Vs. Case Temperature

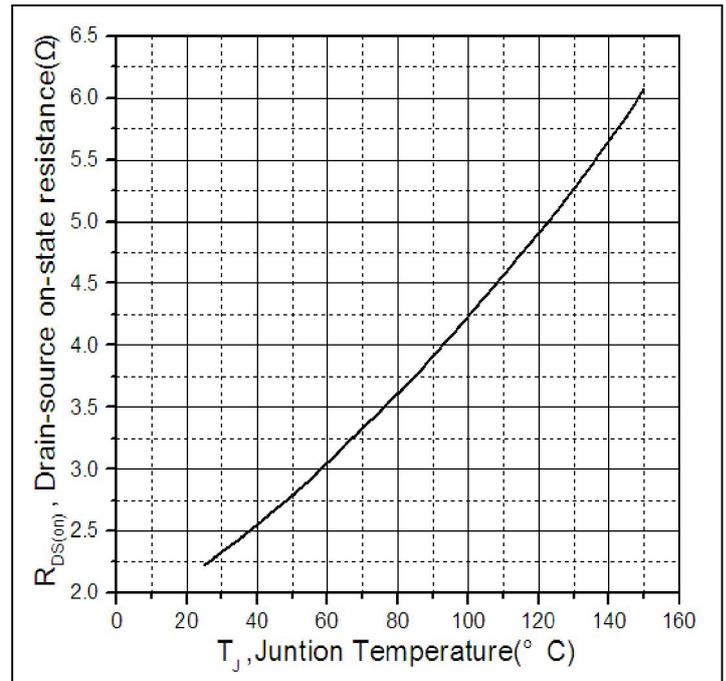


Figure 4: Normalized On-Resistance Vs. Case Temperature

Typical Electrical and Thermal Characteristics

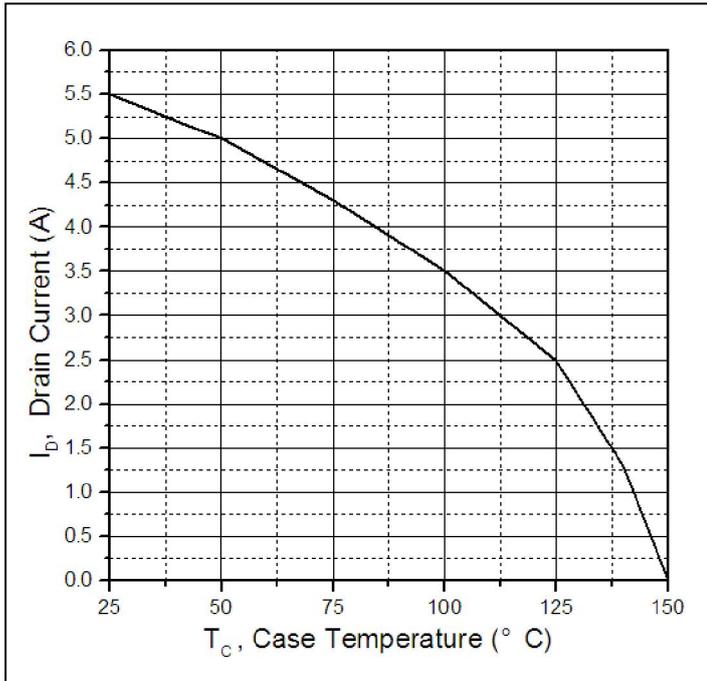


Figure 5. Maximum Drain Current Vs. Case Temperature

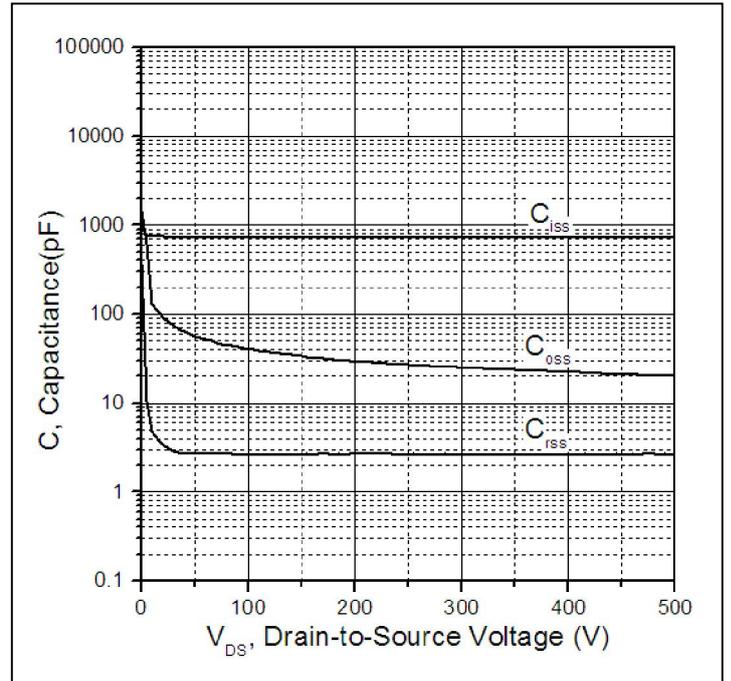


Figure 6. Typical Capacitance Vs. Drain-to-Source Voltage

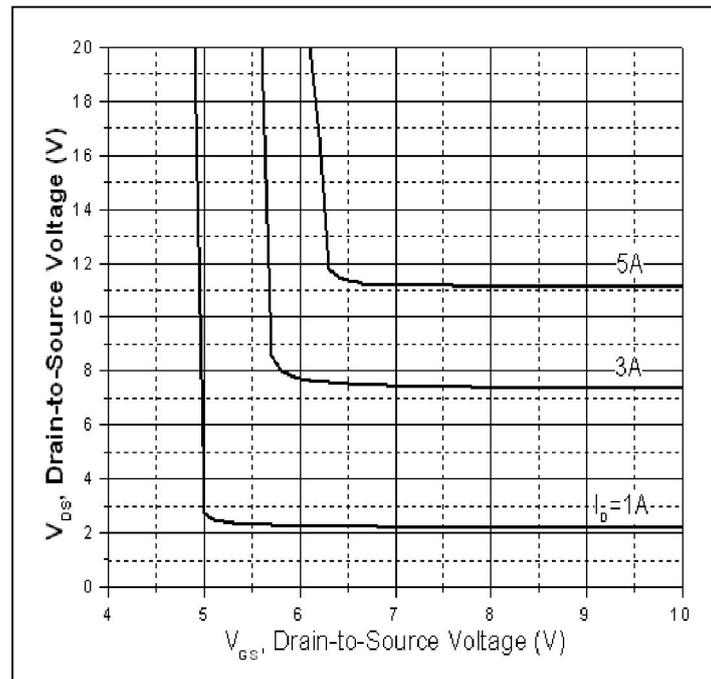
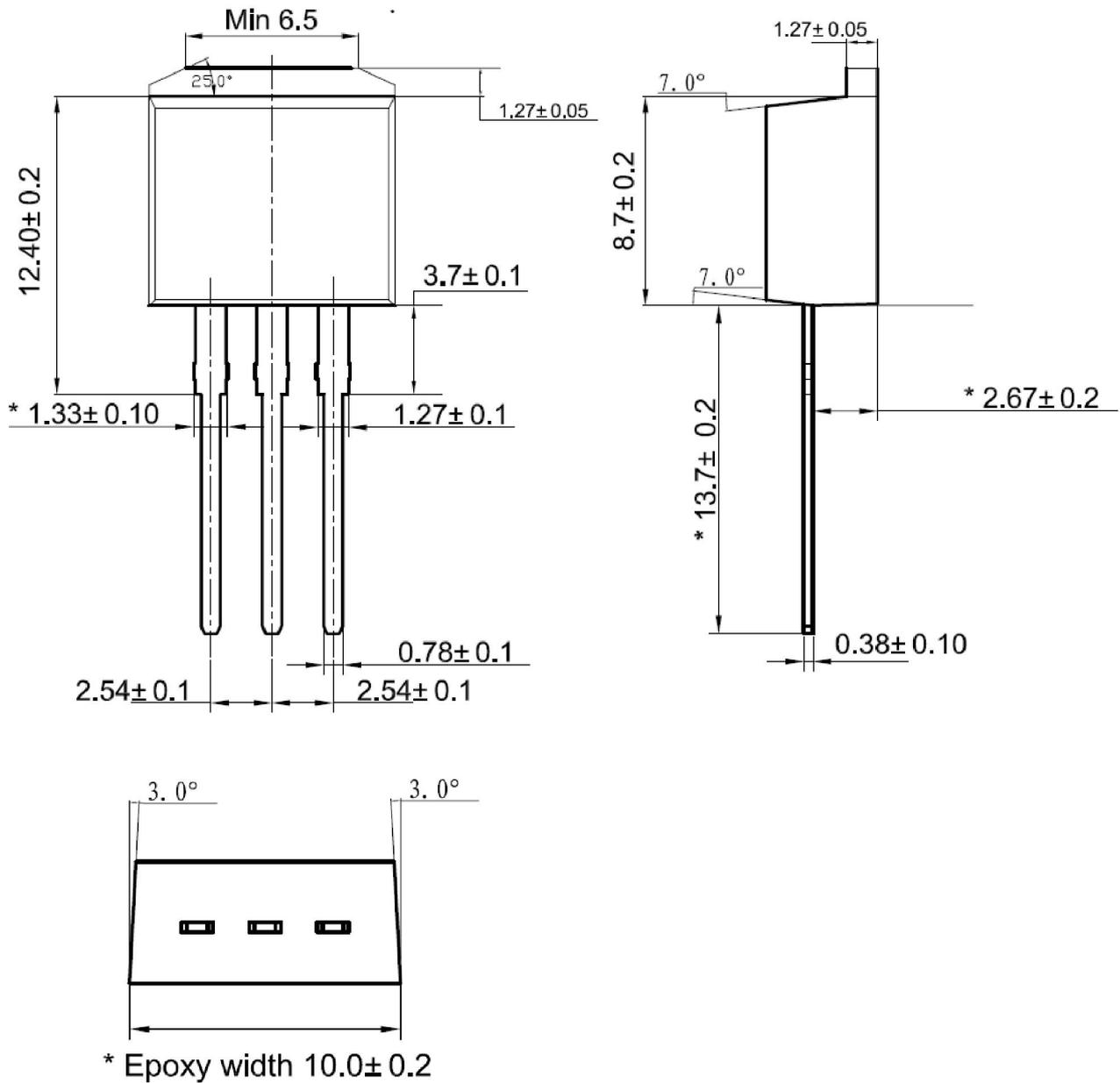


Figure 7. Drain-to-Source Voltage Vs. Gate-to-Source Voltage

Mechanical Data

TO-262 PACKAGE OUTLINE DIMENSION / Unit: mm





Ordering and Marking Information

Device Marking: SSF6N80A6

Package (Available)

TO-262

Operating Temperature Range

C : -55 to 150 °C

Devices per Unit

Package Type	Units/Tube	Tubes/Inner Box	Units/Inner Box	Inner Boxes/Carton Box	Units/Carton Box
TO-262	50	20	1000	4	4000

Reliability Test Program

Test Item	Conditions	Duration	Sample Size
High Temperature Reverse Bias(HTRB)	$T_j=125^{\circ}\text{C}$ to 150°C @ 80% of Max $V_{DSS}/V_{CES}/V_R$	168 hours 500 hours 1000 hours	3 lots x 77 devices
High Temperature Gate Bias(HTGB)	$T_j=150^{\circ}\text{C}$ @ 100% of Max V_{GSS}	168 hours 500 hours 1000 hours	3 lots x 77 devices