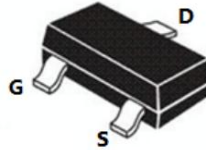
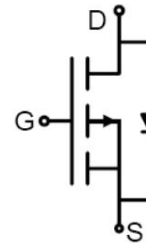


Main Product Characteristics:

V_{DSS}	-20V
$R_{DS(on)}$	15.6m Ω (typ.)
I_D	-9A


SOT23-3L

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


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
$I_D @ T_C = 25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10\text{V}$ ①	-9	A
$I_D @ T_C = 100^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10\text{V}$ ①	-5	
I_{DM}	Pulsed Drain Current ②	-36	
$P_D @ T_C = 25^\circ\text{C}$	Power Dissipation ③	2	W
V_{DS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-to-Source Voltage	± 12	V
E_{AS}	Single Pulse Avalanche Energy @ $L=0.5\text{mH}$	20	mJ
$T_J \quad T_{STG}$	Operating Junction and Storage Temperature Range	-55 to +150	$^\circ\text{C}$

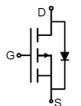
Thermal Resistance

Symbol	Characterizes	Typ.	Max.	Units
$R_{\theta JA}$	Junction-to-ambient ($t \leq 10s$) ④	—	63	$^{\circ}C/W$

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

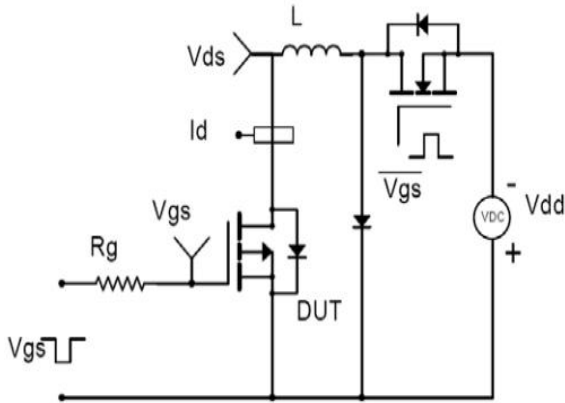
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	-20	—	—	V	$V_{GS} = 0V, I_D = -250\mu A$
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	15.6	21	m Ω	$V_{GS} = -4.5V, I_D = -5A$
		—	21.4	29		$V_{GS} = -2.5V, I_D = -4A$
$V_{GS(th)}$	Gate threshold voltage	-0.5	—	-1	V	$V_{DS} = V_{GS}, I_D = -250\mu A$
I_{DSS}	Drain-to-Source leakage current	—	—	-1	μA	$V_{DS} = -20V, V_{GS} = 0V$
I_{GSS}	Gate-to-Source forward leakage	—	—	100	nA	$V_{GS} = 12V$
		—	—	-100		$V_{GS} = -12V$
C_{iss}	Input capacitance	—	1980	—	pF	$V_{GS} = 0V$
C_{oss}	Output capacitance	—	240	—		$V_{DS} = -10V$
C_{rss}	Reverse transfer capacitance	—	225	—		$f = 1MHz$
Q_g	Total gate charge	—	15	—	nC	$I_D = -5A,$
Q_{gs}	Gate-to-Source charge	—	2.5	—		$V_{DS} = -10V,$
Q_{gd}	Gate-to-Drain("Miller") charge	—	4.3	—		$V_{GS} = -4.5V$
$t_{d(on)}$	Turn-on delay time	—	9	—	ns	$V_{GS} = -4.5V, V_{DS} = -10V,$ $R_{GEN}=3\Omega, R_L=2\Omega$
t_r	Rise time	—	28	—		
$t_{d(off)}$	Turn-Off delay time	—	24	—		
t_f	Fall time	—	7	—		

Source-Drain Ratings and Characteristics

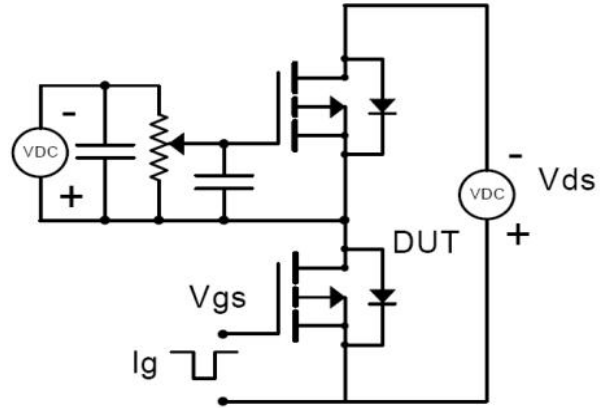
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	-9	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode)	—	—	-36	A	
V_{SD}	Diode Forward Voltage	—	—	-1.2	V	$I_S = -10A, V_{GS} = 0V$

Test Circuits and Waveforms

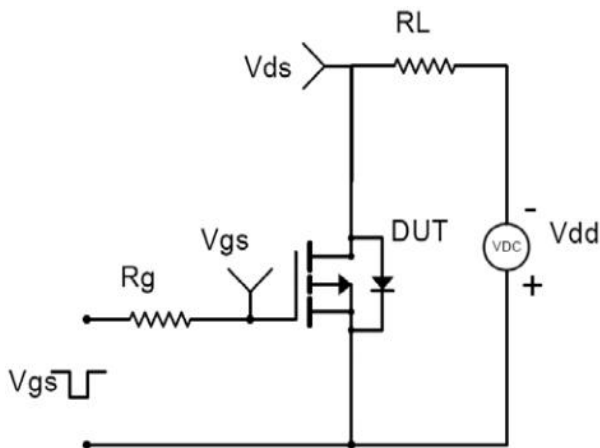
EAS Test Circuit:



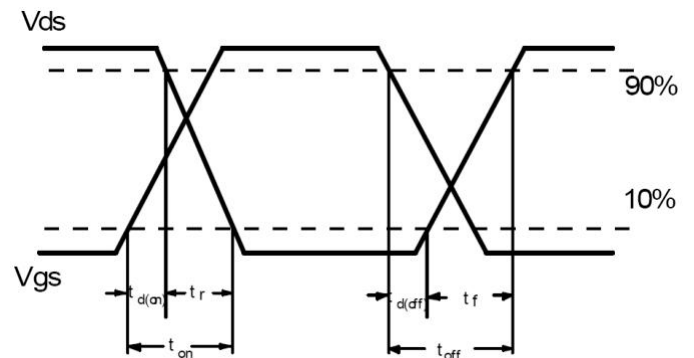
Gate Charge Test Circuit:



Switching Time Test Circuit:



Switching 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

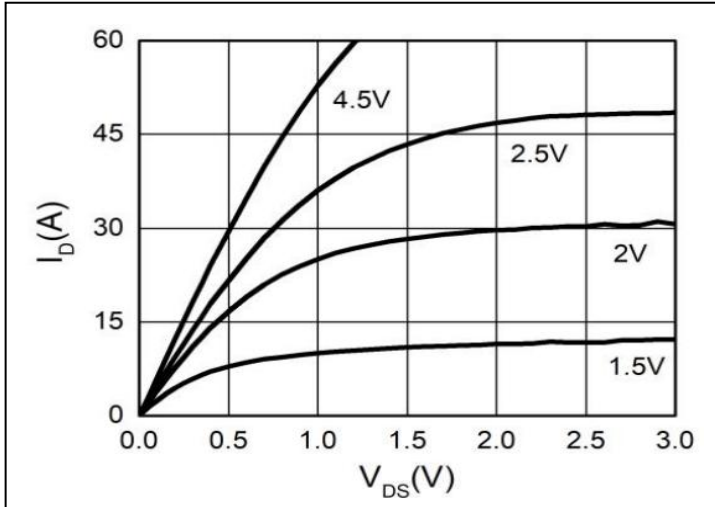


Figure 1. Typical Output Characteristics

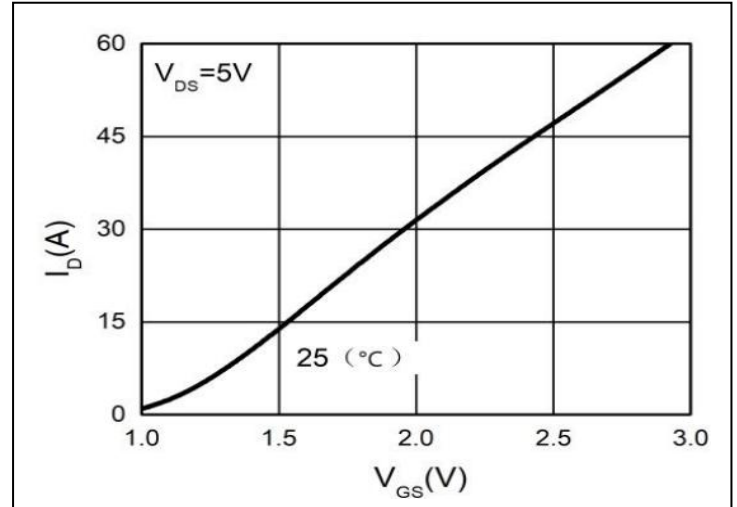


Figure 2. Transfer Characteristics

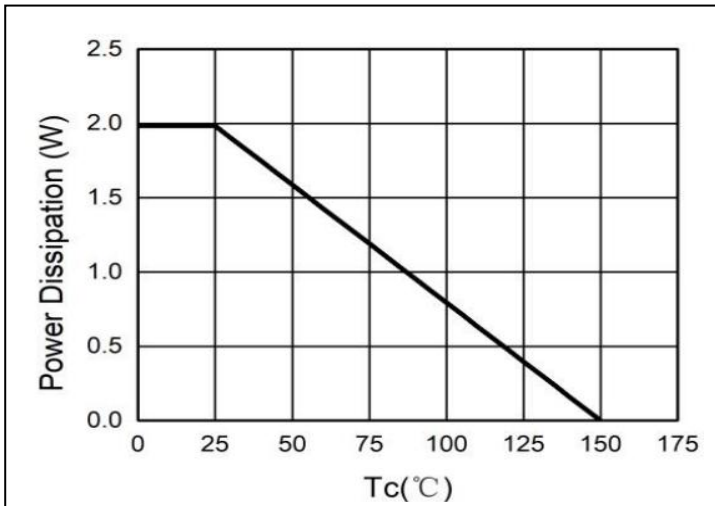


Figure 3. Power Dissipation

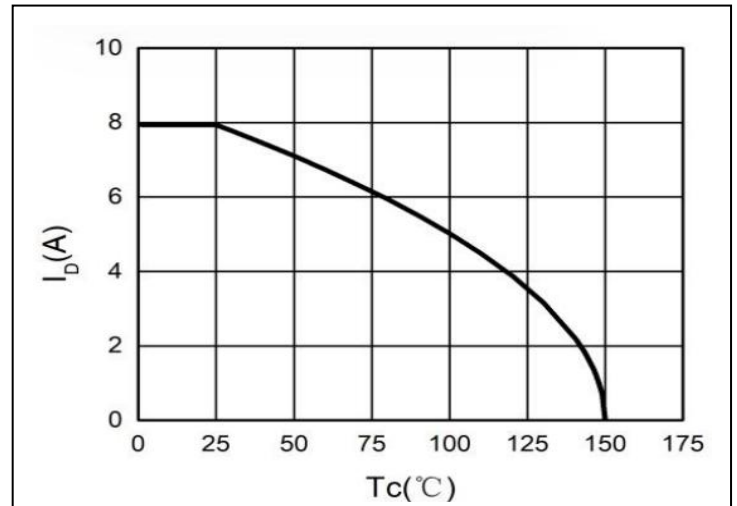


Figure 4. Drain Current

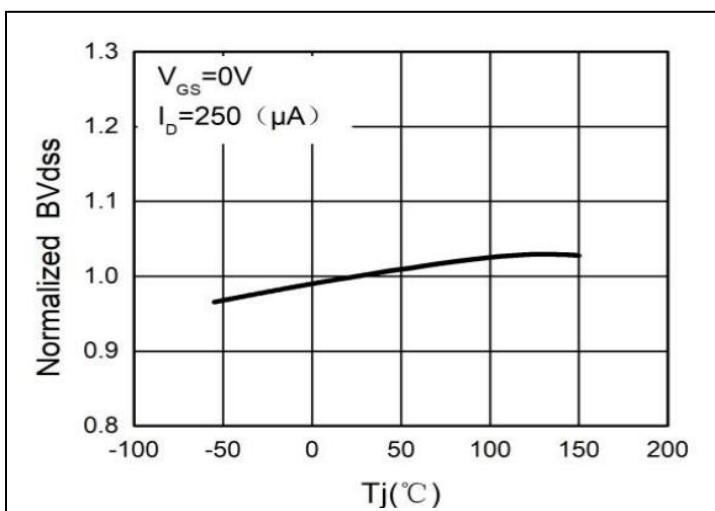


Figure 5. BV_{DS} vs Junction Temperature

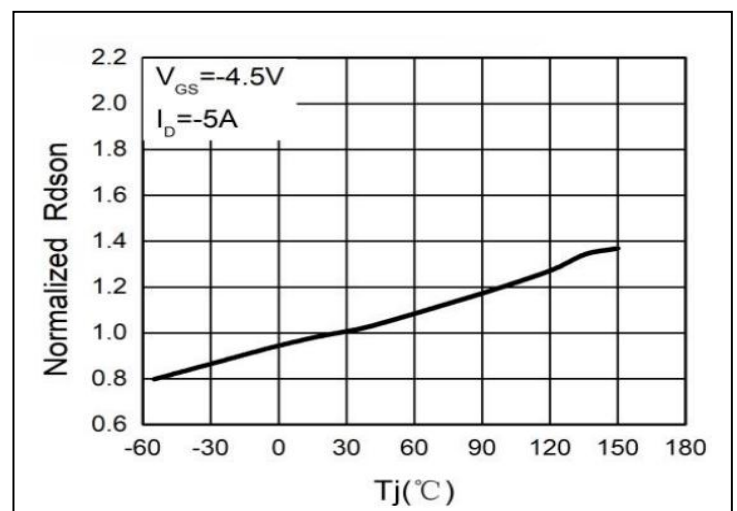


Figure 6. $R_{DS(ON)}$ vs Junction Temperature

Typical Electrical and Thermal Characteristics

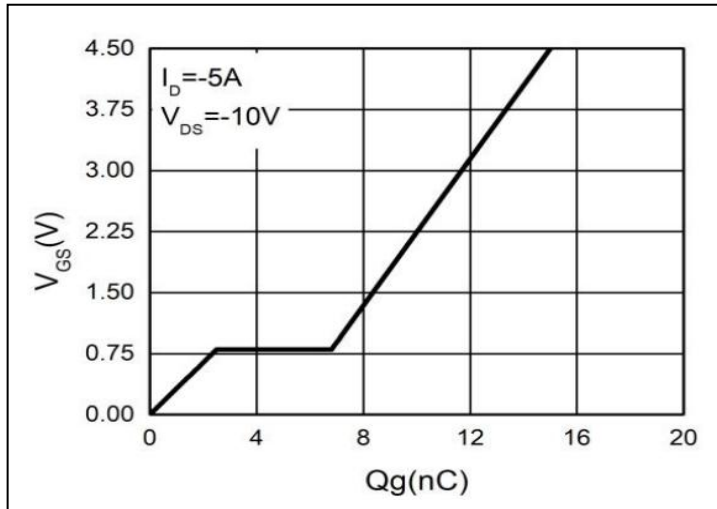


Figure 7. Gate Charge

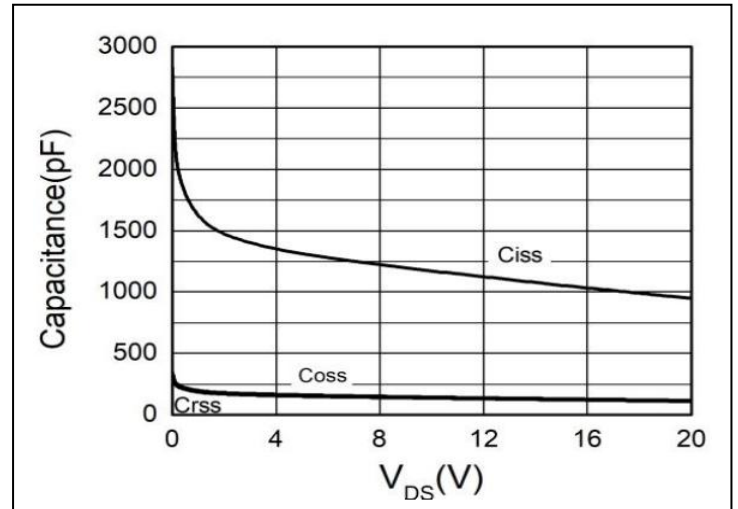


Figure 8. Capacitance

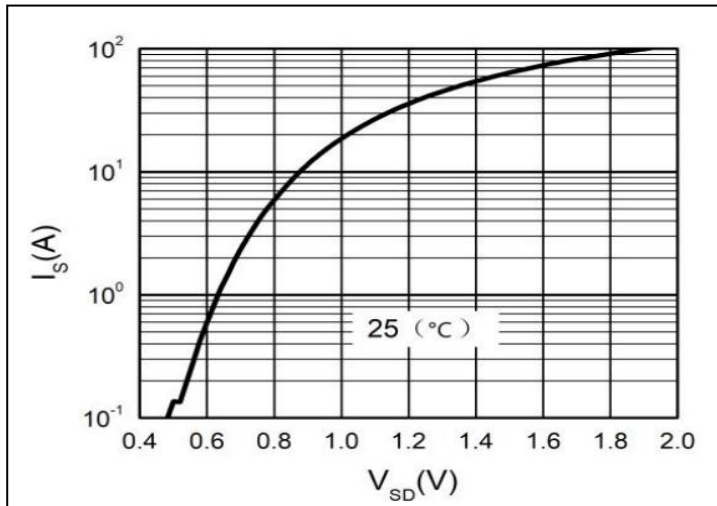


Figure 9. Body-Diode Characteristics

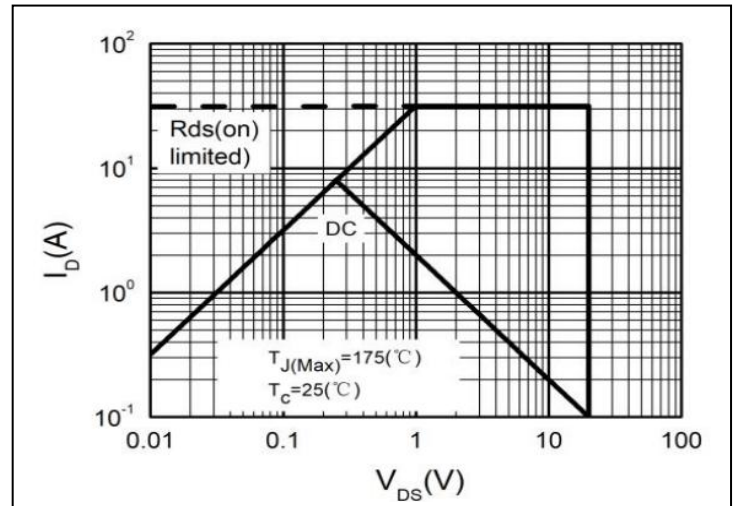
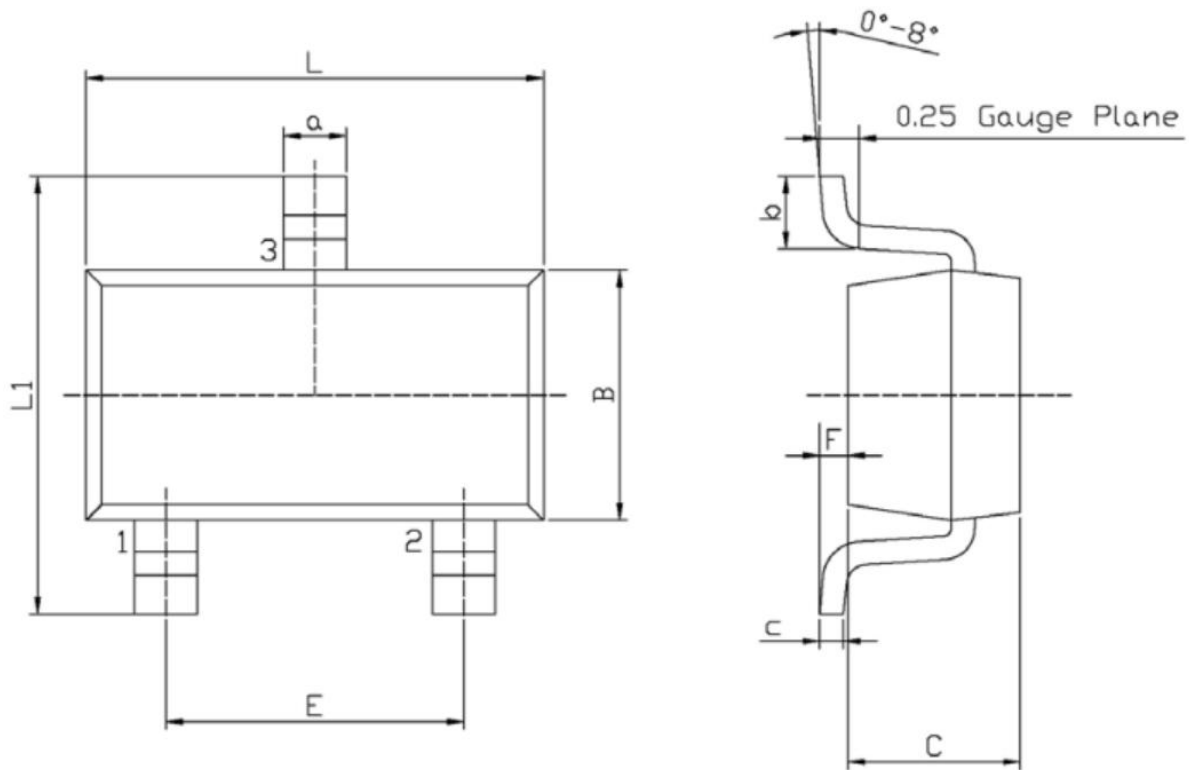


Figure 10. Maximum Safe Operating Area

Mechanical Data:


Unit: mm

Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
L	2.82	3.02	a	0.35	0.50
B	1.50	1.70	c	0.10	0.20
C	0.90	1.30	b	0.35	0.55
L1	2.60	3.00	F	0	0.15
E	1.80	2.00			

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