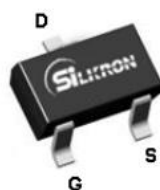
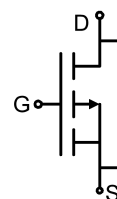


**Main Product Characteristics:**

$V_{DSS}$	-20V
$R_{DS(on)}$	21.3m $\Omega$ (typ.)
$I_D$	-6A


**SOT-23**

**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	-6	A
$I_D @ T_C = 100^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10\text{V}$ ①	-4	
$I_{DM}$	Pulsed Drain Current ②	-24	
$P_D @ T_C = 25^\circ\text{C}$	Power Dissipation ③	1.6	W
$V_{DS}$	Drain-Source Voltage	-20	V
$V_{GS}$	Gate-to-Source Voltage	$\pm 10$	V
$T_J \quad T_{STG}$	Operating Junction and Storage Temperature Range	-55 to +150	$^\circ\text{C}$

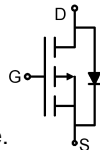
## Thermal Resistance

Symbol	Characterizes	Typ.	Max.	Units
R <sub>θJA</sub>	Junction-to-ambient (t ≤ 10s) ④	—	75	°C/W

## Electrical Characterizes @T<sub>A</sub>=25°C unless otherwise specified

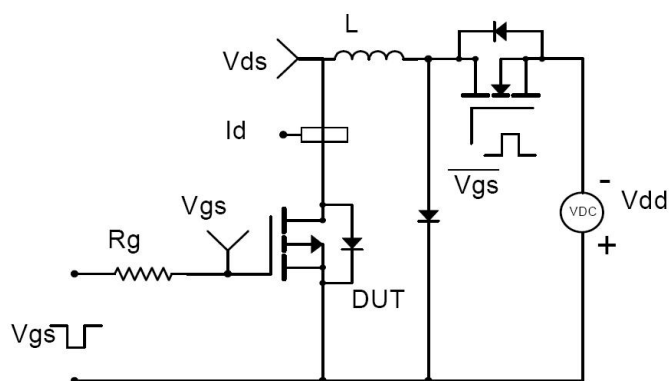
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
V <sub>(BR)DSS</sub>	Drain-to-Source breakdown voltage	-20	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA
R <sub>DS(on)</sub>	Static Drain-to-Source on-resistance	—	21.3	28	mΩ	V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-5A
		—	27.3	36	mΩ	V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-4A
V <sub>GS(th)</sub>	Gate threshold voltage	-0.5	—	-1	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =-250μA
I <sub>DSS</sub>	Drain-to-Source leakage current	—	—	-1	μA	V <sub>DS</sub> = -20V, V <sub>GS</sub> = 0V
I <sub>GSS</sub>	Gate-to-Source forward leakage	—	—	100	nA	V <sub>GS</sub> = 10V
		—	—	-100		V <sub>GS</sub> = -10V
Q <sub>g</sub>	Total gate charge	—	14	—	nC	I <sub>D</sub> = -6A, V <sub>DS</sub> =-10V, V <sub>GS</sub> = -4.5V
Q <sub>gs</sub>	Gate-to-Source charge	—	1.1	—		
Q <sub>gd</sub>	Gate-to-Drain("Miller") charge	—	4.8	—		
t <sub>d(on)</sub>	Turn-on delay time	—	13	—	ns	V <sub>GS</sub> =-4.5V, V <sub>DD</sub> =-20V, R <sub>GEN</sub> =6Ω R <sub>L</sub> =1.5Ω
t <sub>r</sub>	Rise time	—	32	—		
t <sub>d(off)</sub>	Turn-Off delay time	—	27	—		
t <sub>f</sub>	Fall time	—	9	—		
C <sub>iss</sub>	Input capacitance	—	1490	—	pF	V <sub>GS</sub> = 0V V <sub>DS</sub> = -20V f = 1MHz
C <sub>oss</sub>	Output capacitance	—	175	—		
C <sub>riss</sub>	Reverse transfer capacitance	—	130	—		

## Source-Drain Ratings and Characteristics

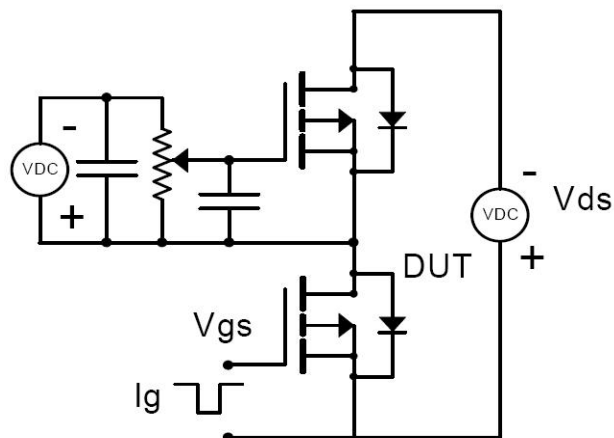
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I <sub>S</sub>	Continuous Source Current (Body Diode)	—	—	-6	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I <sub>SM</sub>	Pulsed Source Current (Body Diode)	—	—	-24	A	
V <sub>SD</sub>	Diode Forward Voltage	—	—	-1.2	V	

## Test Circuits and Waveforms

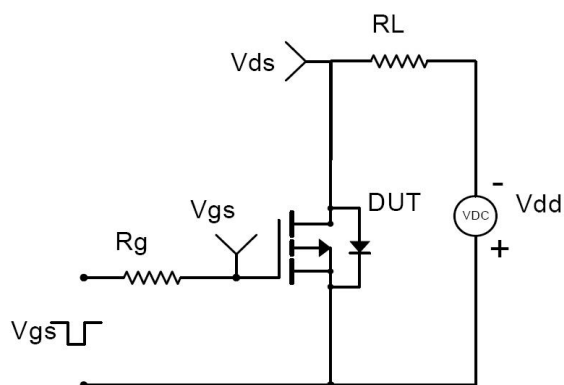
EAS Test Circuit:



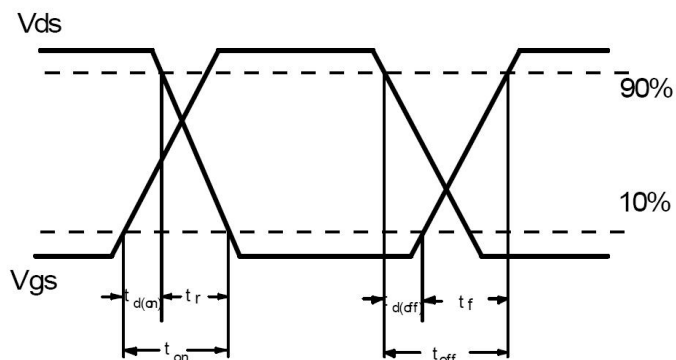
Gate Charge Test Circuit:



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  $T_A = 25^\circ C$

Typical Electrical and Thermal Characteristics

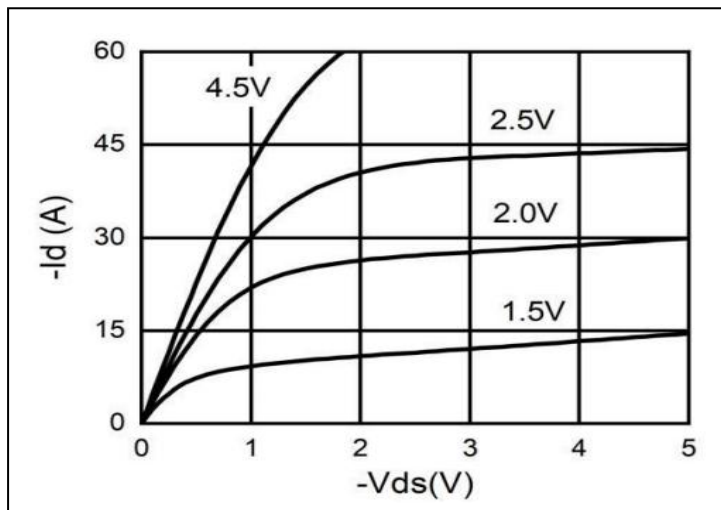


Figure1. Typical Output Characteristics

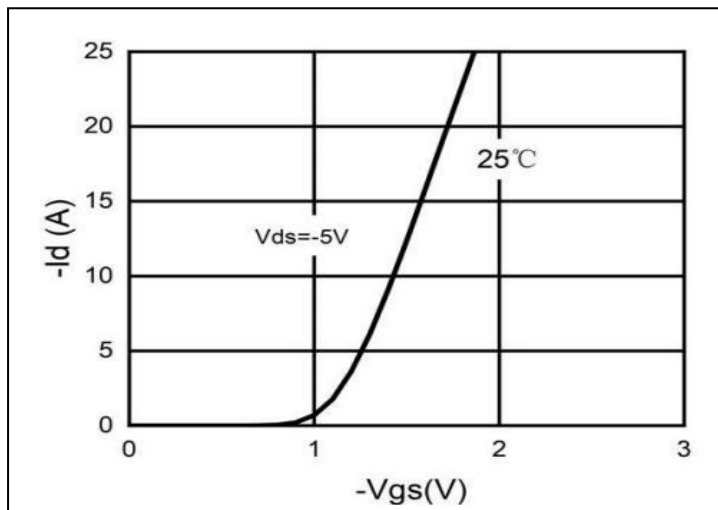


Figure2. Transfer Characteristics

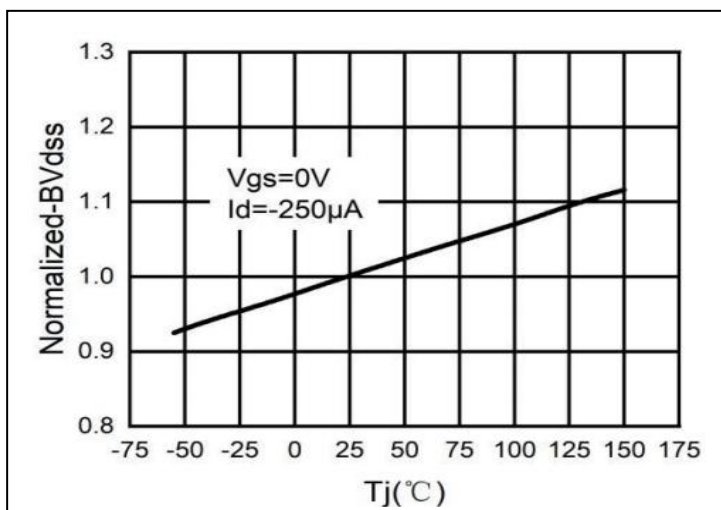


Figure3. BVdss vs. Junction Temperature

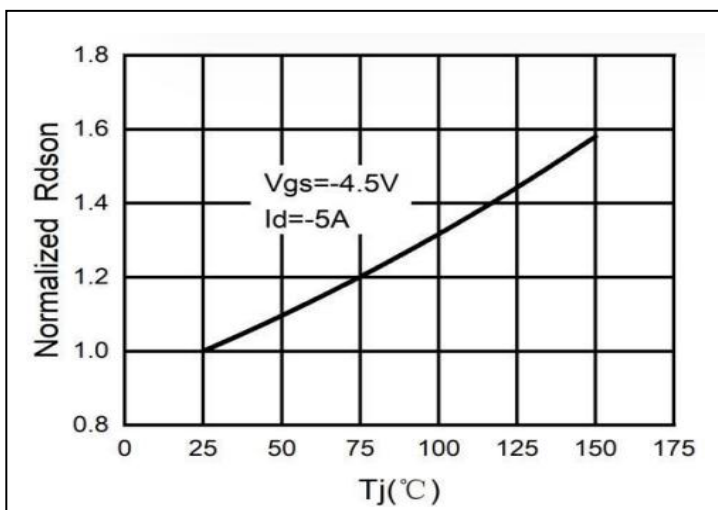


Figure 4.  $R_{DS(on)}$  vs. Junction Temperature

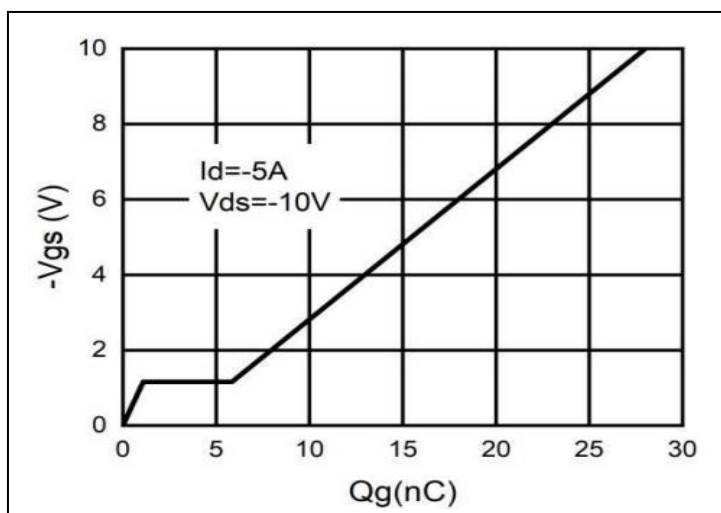


Figure5. Gate Charge Waveforms

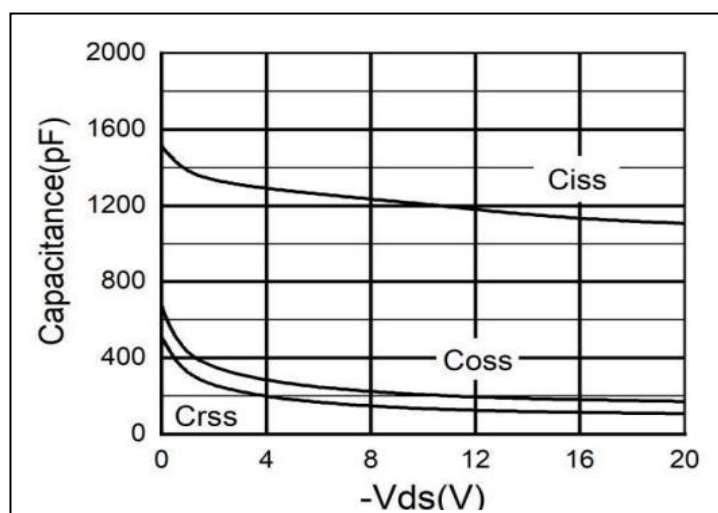


Figure6. Capacitance

Typical Electrical and Thermal Characteristics

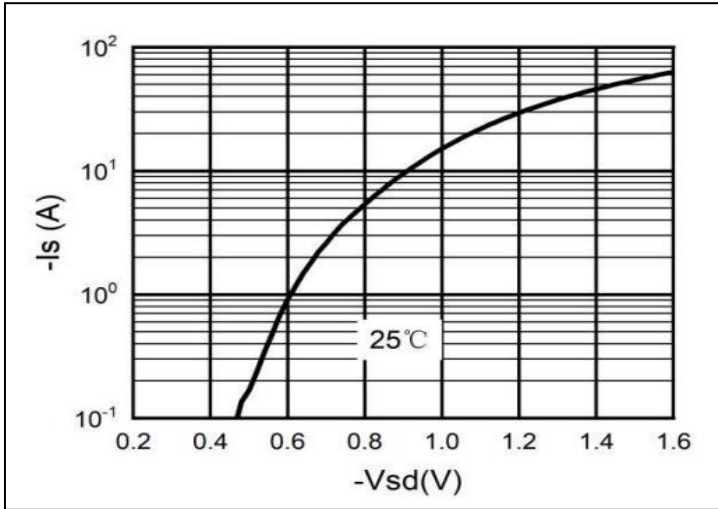


Figure7. Body-Diode Characteristics

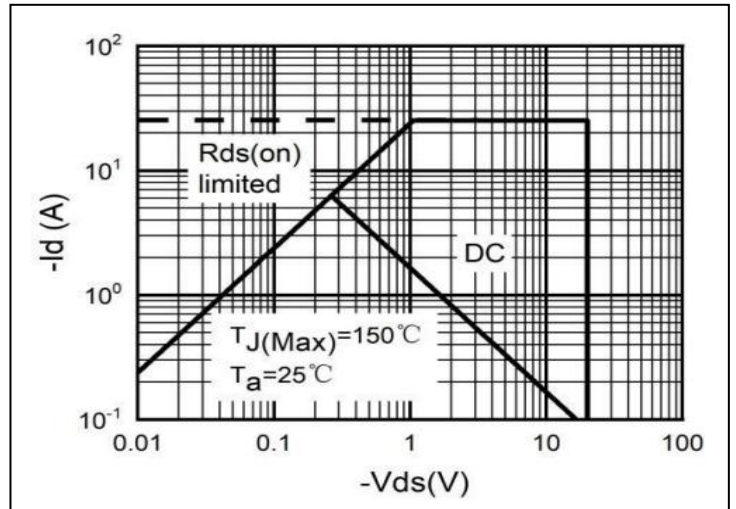
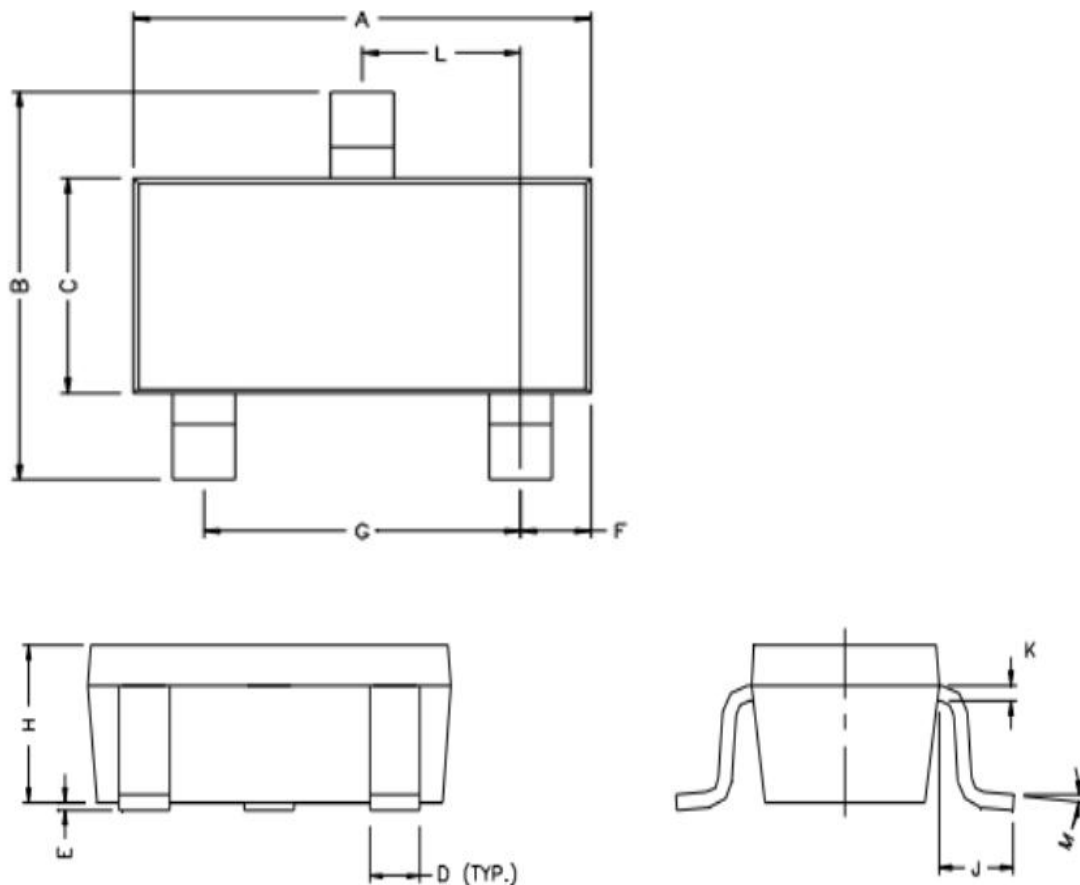


Figure8. Maximum Safe Operating Area

**Mechanical Data:**

SOT-23 Package Outline (Unit:mm)



REF.	Millimeter		REF.	Millimete	
	Min.	Max.		Min.	Max.
A	2.80	3.00	G	1.80	2.00
B	2.30	2.50	H	0.90	1.1
C	1.20	1.40	K	0.10	0.20
D	0.30	0.50	J	0.35	0.70
E	0	0.10	L	0.92	0.98
F	0.45	0.55	M	0°	10°

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