

## N-Channel 60-V (D-S) MOSFET

### PRODUCT SUMMARY

$V_{DS}$ (V)	$R_{DS(on)}$ ( $\Omega$ )	$I_D$ (mA)
60	3 at $V_{GS} = 10$ V	340
	4 at $V_{GS} = 4.5$ V	
	4.5 at $V_{GS} = 3$ V	

### FEATURES

- Halogen-free According to IEC 61249-2-21 Definition
- Super high density cell design for extremely low  $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- Capable doing Cu wire bonding
- ESD protected Gate HBM 2KV

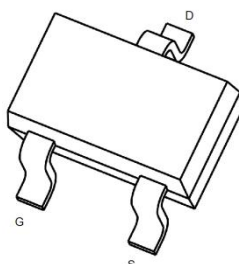


**RoHS\***  
 COMPLIANT  
 HALOGEN  
**FREE**  
 Available

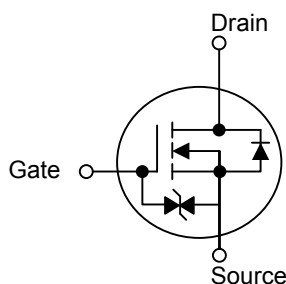
### APPLICATIONS

- Power Management in Note book
- Portable Equipment
- Battery Powered System

### Package:



**SOT-323**



### ABSOLUTE MAXIMUM RATINGS $T_A = 25^\circ\text{C}$ , unless otherwise noted

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	
Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) <sup>b</sup>	$T_A = 25^\circ\text{C}$	$I_D$	mA
	$T_A = 100^\circ\text{C}$	340	
Pulsed Drain Current <sup>a</sup>	$I_{DM}$	800	
Power Dissipation <sup>b</sup>	$T_A = 25^\circ\text{C}$	$P_D$	W
	$T_A = 100^\circ\text{C}$	0.2	
Maximum Junction-to-Ambient <sup>b</sup>	$R_{thJA}$	625	$^\circ\text{C/W}$
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	- 55 to 150	$^\circ\text{C}$

Notes:

- a. Pulse width limited by maximum junction temperature.  
 b. Surface Mounted on FR4 board.

\* Pb containing terminations are not RoHS compliant, exemptions may apply.

SPECIFICATIONS T <sub>A</sub> = 25 °C, unless otherwise noted						
Parameter	Symbol	Test Conditions	Limits			Unit
			Min.	Typ. <sup>a</sup>	Max.	
Static						
Drain-Source Breakdown Voltage	V <sub>DS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = 10 μA	60			V
Gate-Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA	1		2.5	
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ± 20 V			± 10	μA
Zero Gate Voltage Drain Current	I <sub>bss</sub>	V <sub>DS</sub> = 60 V, V <sub>GS</sub> = 0 V			1	
On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	V <sub>GS</sub> = 10 V, V <sub>DS</sub> = 7.5 V	800			mA
		V <sub>GS</sub> = 4.5 V, V <sub>DS</sub> = 10 V	500			
Drain-Source On-Resistance <sup>a</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 500 mA		1.3	3	Ω
		V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 200 mA		1.8	4	
		V <sub>GS</sub> = 3 V, I <sub>D</sub> = 10 mA			4.5	
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> = 200 mA, V <sub>GS</sub> = 0 V		0.8	1.3	V
Dynamic <sup>a</sup>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =15V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =200mA		1.5		nC
Gate-Source Charge	Q <sub>gs</sub>			1.9		
Gate-Drain Charge	Q <sub>gd</sub>			0.4		
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1MHz		28		pF
Output Capacitance	C <sub>oss</sub>			9		
Reverse Transfer Capacitance	C <sub>rss</sub>			2		
Switching <sup>a, b, c</sup>						
Turn-On Delay Time	td(on)	V <sub>DD</sub> =30V, R <sub>L</sub> =150Ω I <sub>D</sub> =200mA, V <sub>GEN</sub> =10V, R <sub>G</sub> =10Ω		8.5		ns
Turn-On Rise Time	tr			6		
Turn-Off Delay Time	td(off)			31.8		
Turn-Off Fall Time	tf			15.5		

Notes:

a. For DESIGN AID ONLY, not subject to production testing.

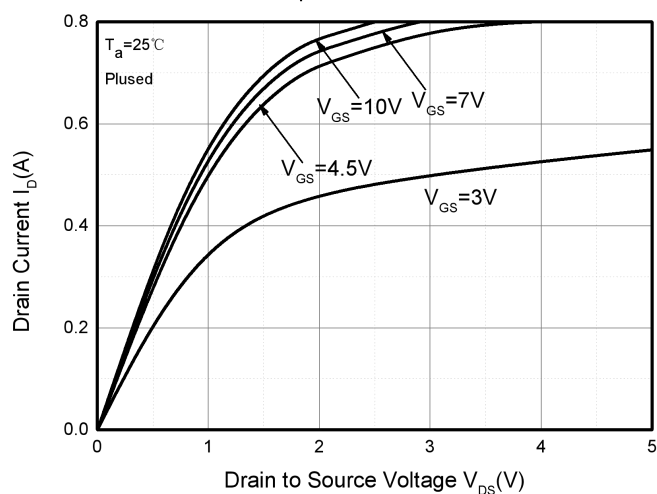
 b. Pulse test:  $PW \leq 300\text{ }\mu\text{s}$  duty cycle  $\leq 2\%$ .

c. Switching time is essentially independent of operating temperature.

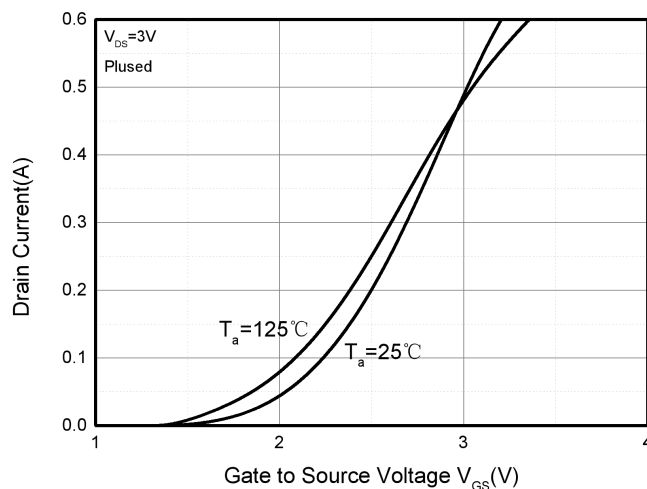
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

**TYPICAL CHARACTERISTICS** 25 °C, unless otherwise noted

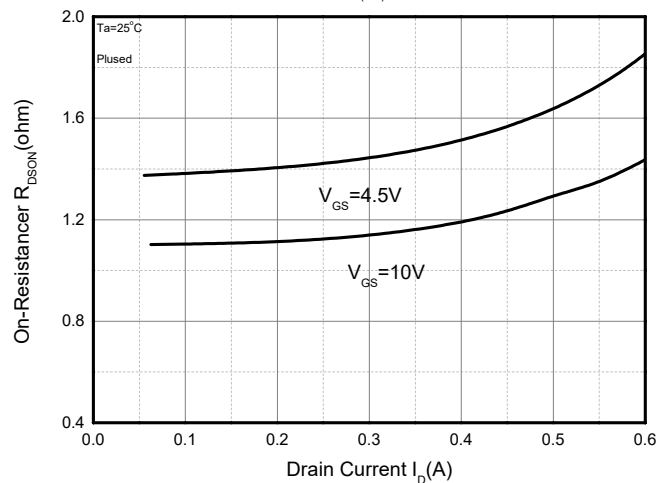
Output Characteristics



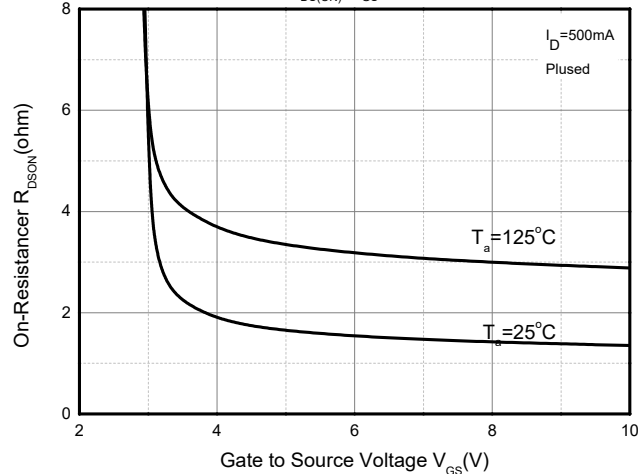
Transfer Characteristics



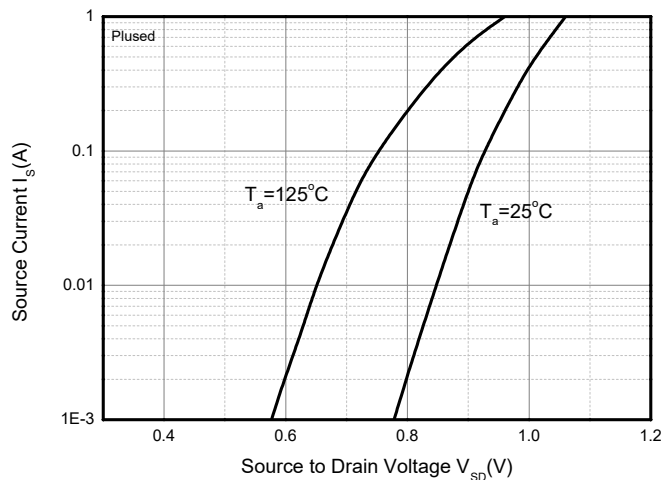
$R_{DS(ON)} - I_D$



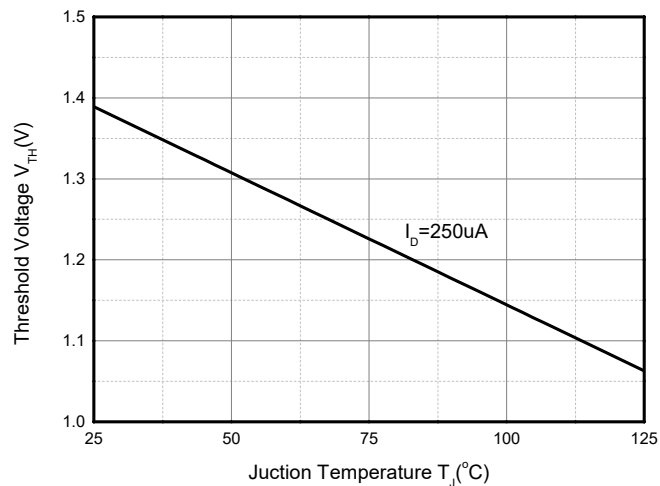
$R_{DS(ON)} - V_{GS}$



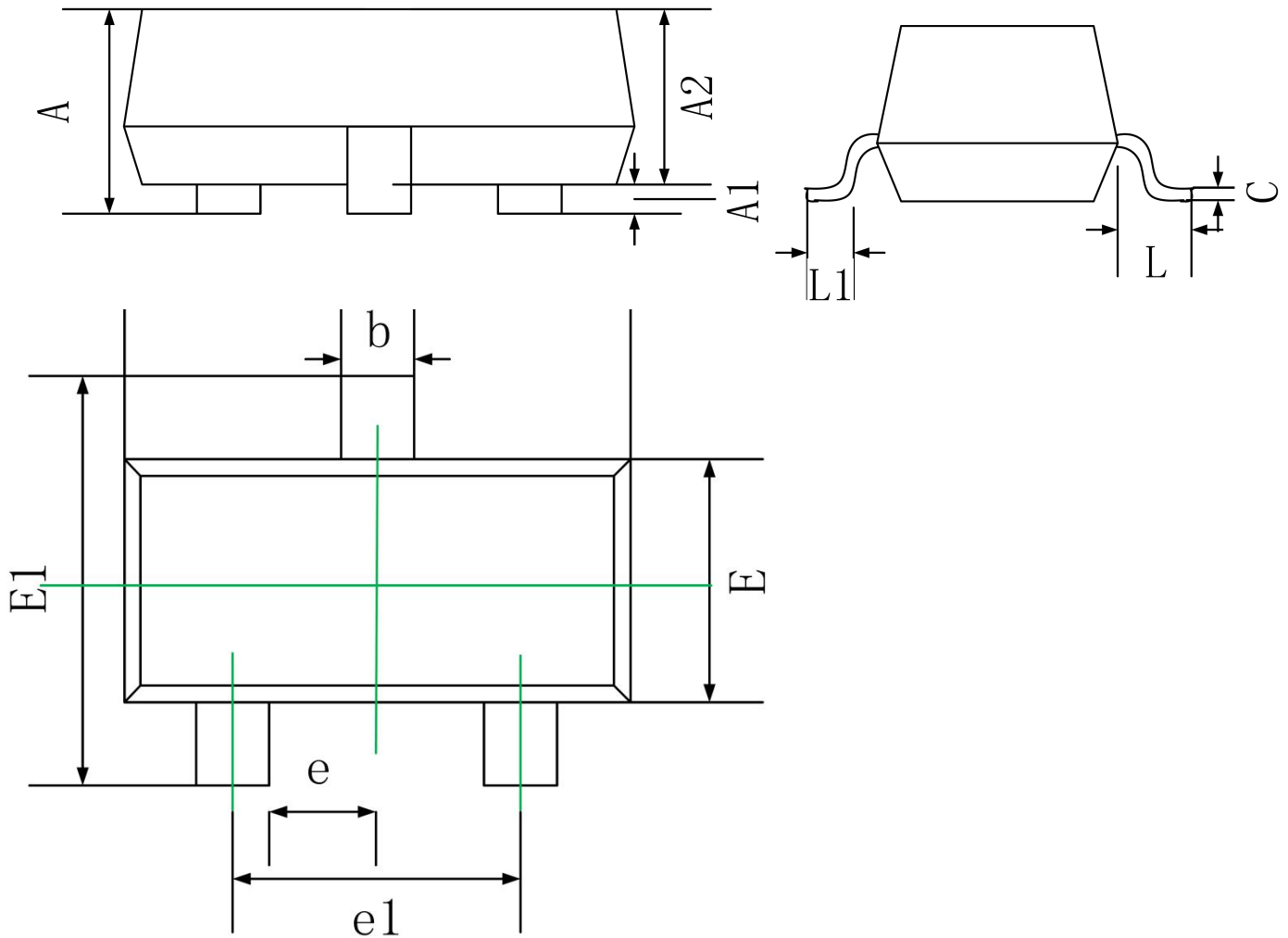
$I_S - V_{SD}$



Threshold Voltage



**SOT-323 Package Information**



Symbol	Dimensions In Millimeters	
	Min.	Max.
A	0.90	1.15
A1	0.00	0.10
A2	0.90	1.00
b	0.30	0.50
c	0.10	0.15
D	2.00	2.20
E	1.15	1.35
E1	2.15	2.40
e	0.65 Typ.	
e1	1.20	1.40
L	0.525 Ref.	
L1	0.26	0.46

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