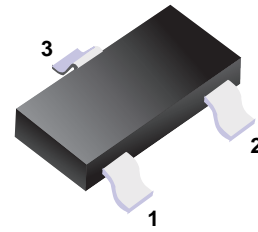


■ N-Channel MOSFET



- 1. Gate
- 2. Source
- 3. Drain

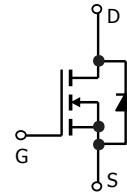
■ Features

- $V_{DS} (V) = 100V$
- $I_D = 0.17 A (V_{GS} = 10V)$
- $R_{DS(ON)} < 6 \Omega (V_{GS} = 10V)$
- $R_{DS(ON)} < 10 \Omega (V_{GS} = 4.5V)$
- ESD Protected 2KV HBM

■ Marking

Marking	SA
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■ Simplified outline(SOT-23)



■ Absolute Maximum Ratings  $T_a = 25^\circ C$

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	100	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	
Continuous Drain Current	$I_D$	0.17	A
Pulsed Drain Current	$I_{DM}$	0.68	
Power Dissipation	$P_D$	0.36	W
Derate Above $25^\circ C$		2.8	mW/ $^\circ C$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	350	$^\circ C/W$
Junction Temperature	$T_J$	150	$^\circ C$
Storage Temperature Range	$T_{stg}$	-55 to 150	

**■ Electrical Characteristics Ta = 25°C**

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V <sub>DSS</sub>	I <sub>D</sub> =250 μA, V <sub>GS</sub> =0V	100			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =100V, V <sub>GS</sub> =0V			1	μA
		V <sub>DS</sub> =100V, V <sub>GS</sub> =0V, T <sub>J</sub> =55°C			60	
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V			±10	
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =1mA	0.8		2.8	V
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =0.17A			6	Ω
		V <sub>GS</sub> =10V, I <sub>D</sub> =0.17A T <sub>J</sub> =125°C			12	
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =0.17A			10	
On State Drain Current	I <sub>D(ON)</sub>	V <sub>GS</sub> =10V, V <sub>DS</sub> =5V	0.68			A
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =0.17A	0.08			S
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =25V, f=1MHz		73		pF
Output Capacitance	C <sub>oss</sub>			7		
Reverse Transfer Capacitance	C <sub>rss</sub>			3.4		
Gate Resistance	R <sub>g</sub>		V <sub>GS</sub> =15mV, f=1MHz		2.2	
Total Gate Charge	Q <sub>g</sub>	V <sub>GS</sub> =10V, V <sub>DS</sub> =30V, I <sub>D</sub> =0.22A		1.8	2.5	nC
Gate Source Charge	Q <sub>gs</sub>			0.2		
Gate Drain Charge	Q <sub>gd</sub>			0.3		
Turn-On DelayTime	t <sub>d(on)</sub>	V <sub>DD</sub> = 30 V, I <sub>D</sub> = 0.28 A, V <sub>GS</sub> = 10 V, R <sub>GEN</sub> = 6 Ω		1.7	3.4	ns
Turn-On Rise Time	t <sub>r</sub>			9	18	
Turn-Off DelayTime	t <sub>d(off)</sub>			17	31	
Turn-Off Fall Time	t <sub>f</sub>			2.4	5	
Body Diode Reverse Recovery Time	t <sub>rr</sub>			11		
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>	I <sub>F</sub> = 0.17A, di/dt= 100A/μs		3		nC
Maximum Body-Diode Continuous Current	I <sub>S</sub>				0.17	A
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =0.34A, V <sub>GS</sub> =0V			1.3	V

Note.: Pulse Test: Pulse Width ≤ 300 us, Duty Cycle ≤ 2.0%

■ Typical Characteristics

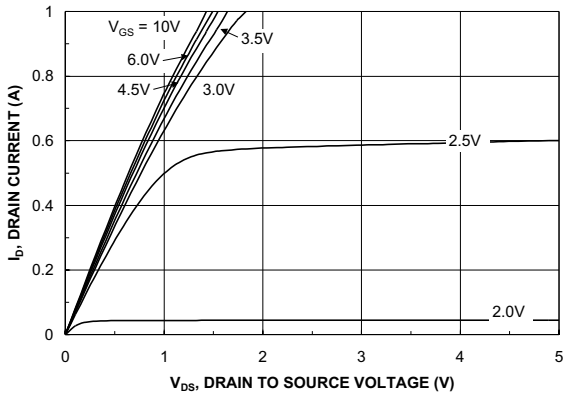


Figure 1. On-Region Characteristics.

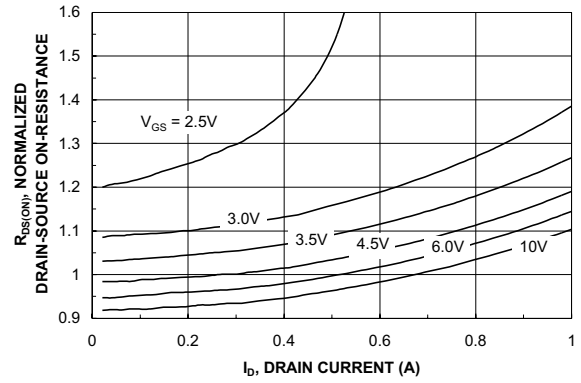


Figure 2. On-Resistance Variation with Drain Current and Gate Voltage.

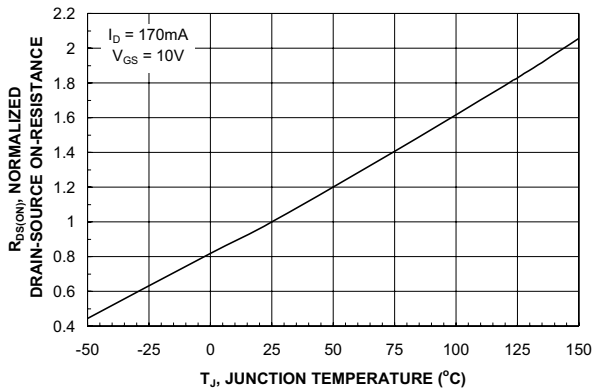


Figure 3. On-Resistance Variation with Temperature.

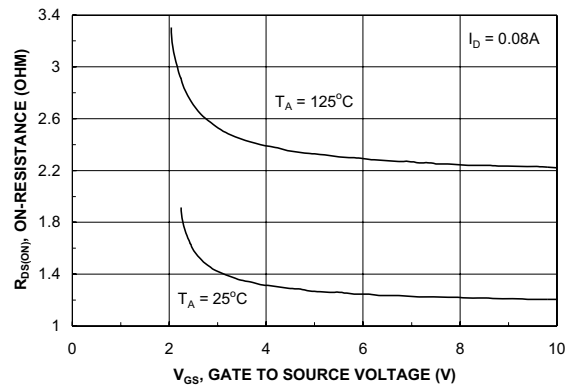


Figure 4. On-Resistance Variation with Gate-to-Source Voltage.

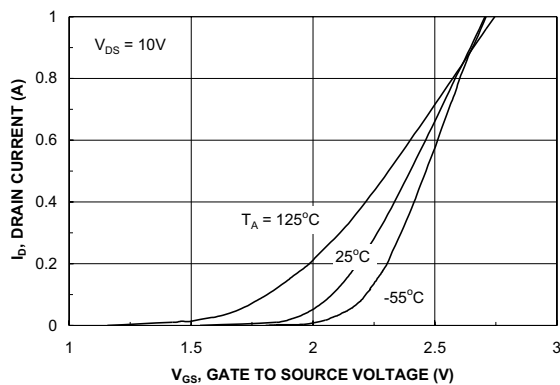


Figure 5. Transfer Characteristics.

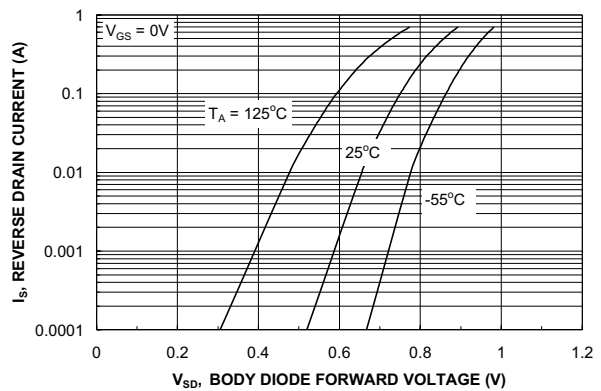


Figure 6. Body Diode Forward Voltage Variation with Source Current and Temperature.

■ Typical Characteristics

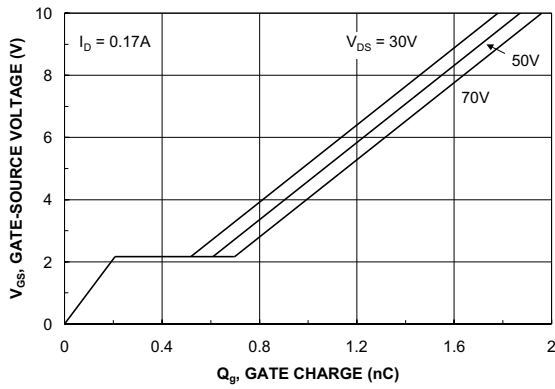


Figure 7. Gate Charge Characteristics.

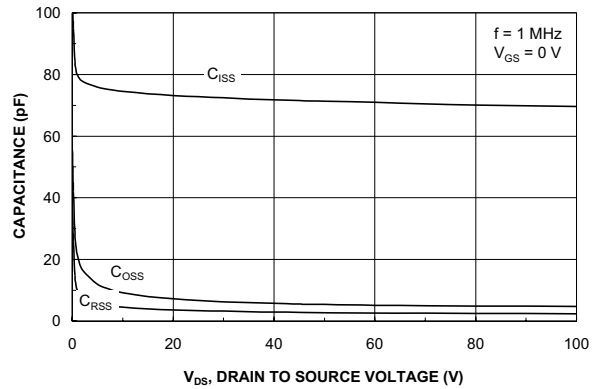


Figure 8. Capacitance Characteristics.

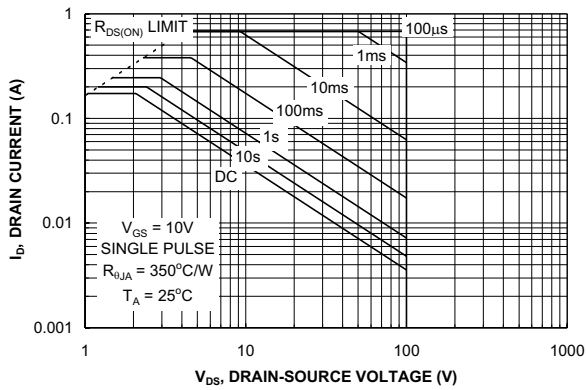


Figure 9. Maximum Safe Operating Area.

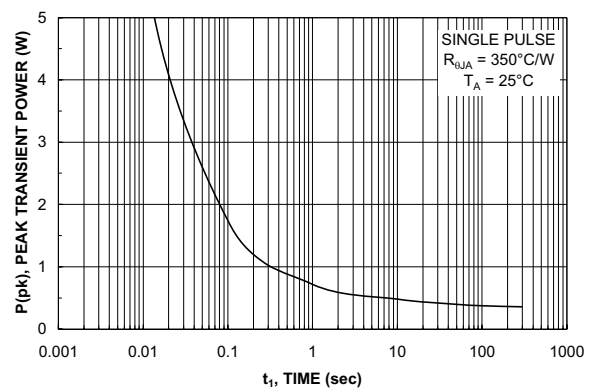
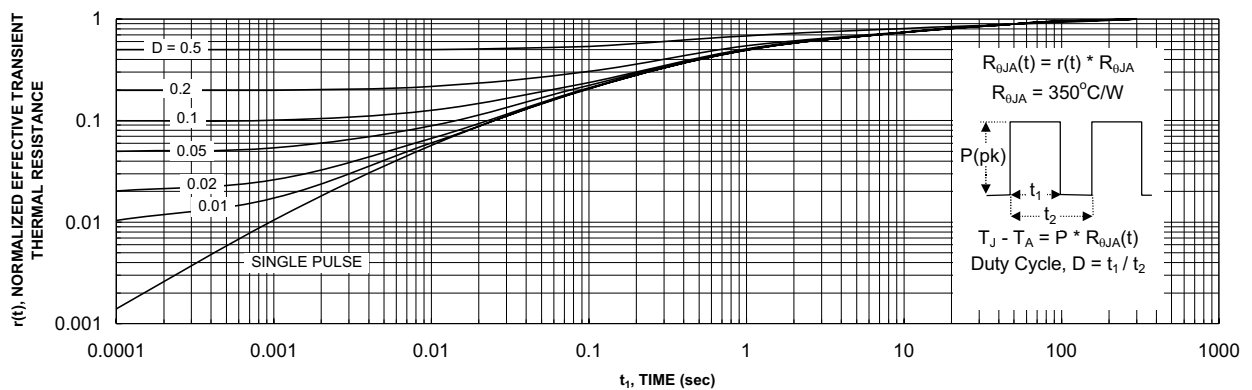
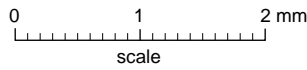
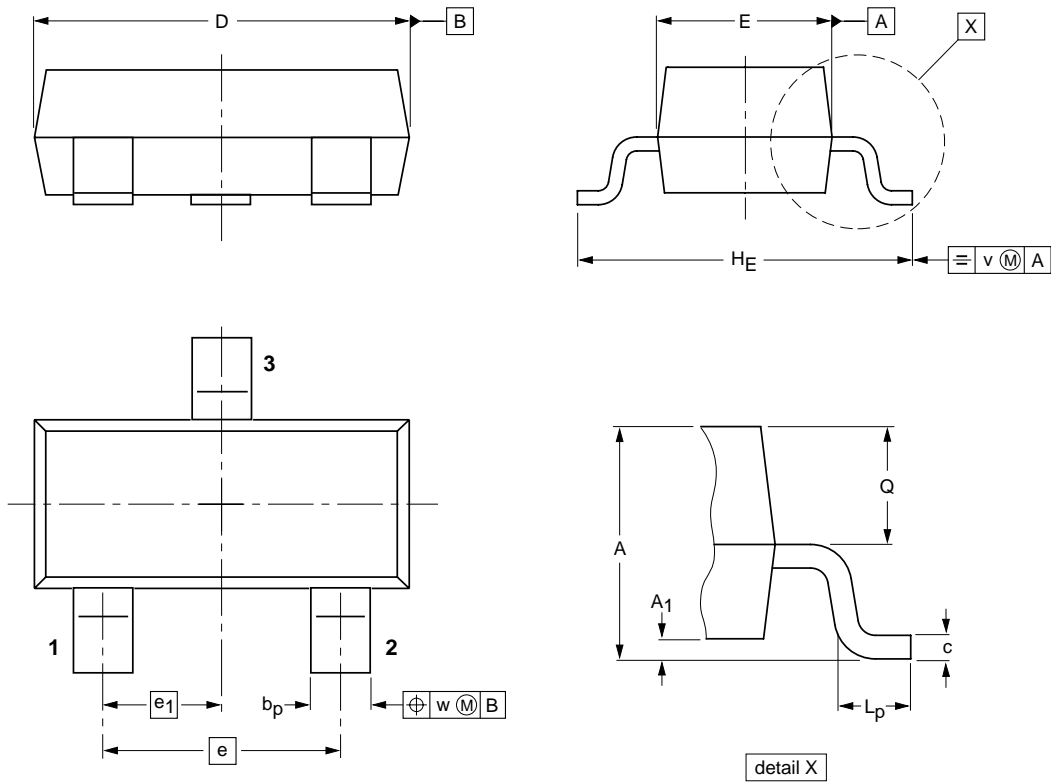


Figure 10. Single Pulse Maximum Power Dissipation.



**Package Outline**

**SOT-23**



**DIMENSIONS (mm are the original dimensions)**

UNIT	A	A <sub>1</sub> max.	b <sub>p</sub>	c	D	E	e	e <sub>1</sub>	H <sub>E</sub>	L <sub>p</sub>	Q	v	w
mm	1.1 0.9	0.1	0.48 0.38	0.15 0.09	3.0 2.8	1.4 1.2	1.9	0.95	2.5 2.1	0.45 0.15	0.55 0.45	0.2	0.1

**Summary of Packing Options**

Package	Packing Description	Packing Quantity	Industry Standard
SOT-23	Tape/Reel, 7" reel	3000	EIA-481-1