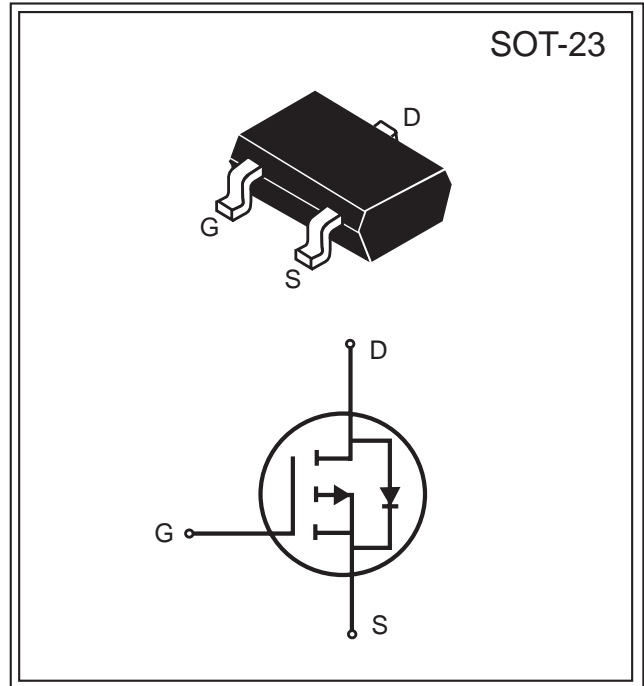




Product Summary		
V <sub>DS</sub> (V)	I <sub>D</sub> (A)	R <sub>DS(ON)</sub> (mΩ) Max
-20V	-2.0A	170 @V <sub>GS</sub> = -4.5V
		240 @V <sub>GS</sub> = -2.5V



### FEATURES

- Super high dense cell design for low R<sub>DS(ON)</sub>.
- Rugged and reliable.
- SOT-23 package.

### ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = 25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V <sub>DS</sub>	-20	V
Gate-Source Voltage	V <sub>GS</sub>	±10	V
Drain Current-Continuous @ T <sub>J</sub> = 25°C	I <sub>D</sub>	-2.0	A
-Pulsed <sup>b</sup>	I <sub>DM</sub>	-7	A
Drain-Source Diode Forward Current <sup>a</sup>	I <sub>S</sub>	-1.25	A
Maximum Power Dissipation <sup>a</sup>	P <sub>D</sub>	1.25	W
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to 150	°C

### THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient <sup>a</sup>	R <sub>JA</sub>	100	°C/W
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South Sea Semiconductor, October 2005 (Rev 2.0)



Electrical Characteristics (T <sub>A</sub> = 25°C unless otherwise noted)						
Parameter	Symbol	Condition	Min	Typ <sup>c</sup>	Max	Unit
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =-250 μA	-20			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =-16V, V <sub>GS</sub> =0V			1	μA
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>GS</sub> = ± 10V, V <sub>DS</sub> =0V			± 100	nA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> I <sub>D</sub> =-250 μA	-0.5	-1	-1.5	V
Drain-Source On-State Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-2.0A		140	170	m
		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-2.0A		190	240	
On-State Drain Current	I <sub>D(ON)</sub>	V <sub>DS</sub> =-5V, V <sub>GS</sub> =-4.5V	-5			A
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =-5V, I <sub>D</sub> =-2A		5		S
Input Capacitance	C <sub>ISS</sub>	V <sub>DS</sub> =-15V V <sub>GS</sub> =0V f=1.0MHz		355		pF
Output Capacitance	C <sub>OSS</sub>			78		
Reverse Transfer Capacitance	C <sub>RSS</sub>			37		
Turn-On Delay Time	t <sub>D(ON)</sub>	V <sub>DD</sub> =-10V, I <sub>D</sub> =-1A, V <sub>GS</sub> =-4.5V, R <sub>GEN</sub> =6 Ω, R <sub>L</sub> =10 Ω		10		ns
Rise Time	t <sub>r</sub>			11		
Turn-Off Delay Time	t <sub>D(OFF)</sub>			141		
Fall Time	t <sub>f</sub>			56		
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =-10V, I <sub>D</sub> =-2.3A, V <sub>GS</sub> =-4.5V		3.5		nC
Gate-Source Charge	Q <sub>gs</sub>			0.5		
Gate-Drain Charge	Q <sub>gd</sub>			1		
Diode Forward Voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =-1.25A		-0.8	-1.2	V

Notes :

- a. Surface Mounted on FR4 Board, t ≤ 10 sec.
- b. Pulse Test : Pulse Width ≤ 300 μs, Duty Cycle ≤ 2%.
- c. Guaranteed by design, not subject to production testing.

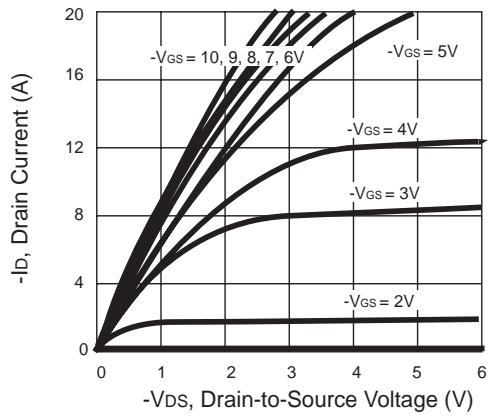


Figure 1. Output Characteristics

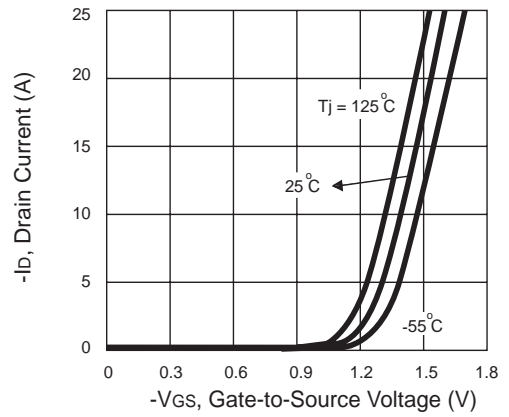


Figure 2. Transfer Characteristics

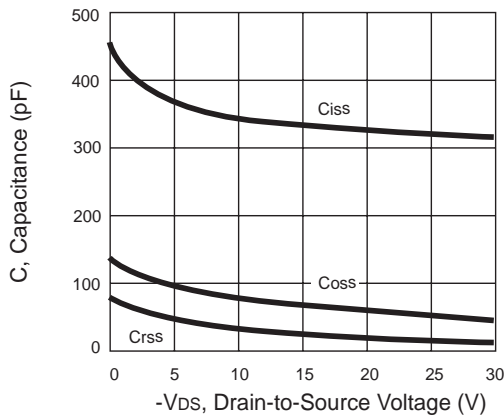


Figure 3. Capacitance

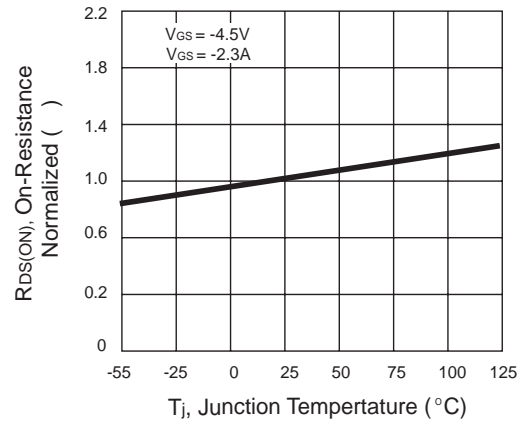


Figure 4. On-Resistance Variation with Temperature

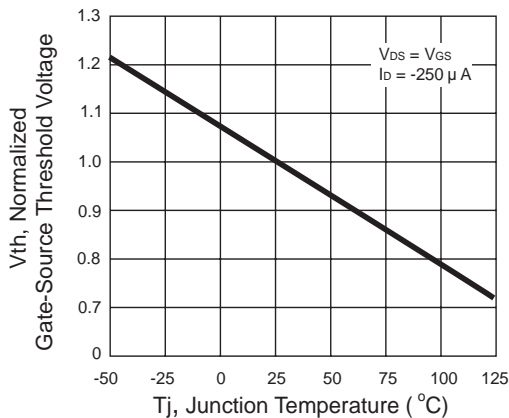


Figure 5. Gate Threshold Variation with Temperature

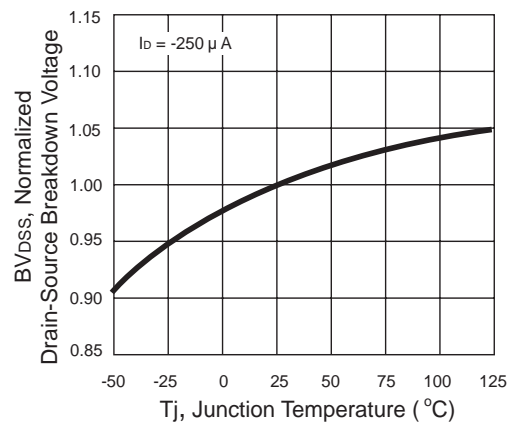
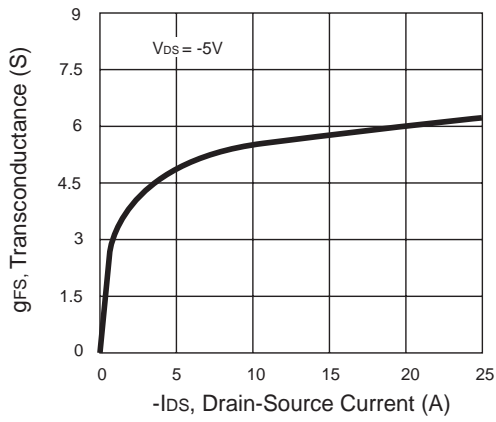
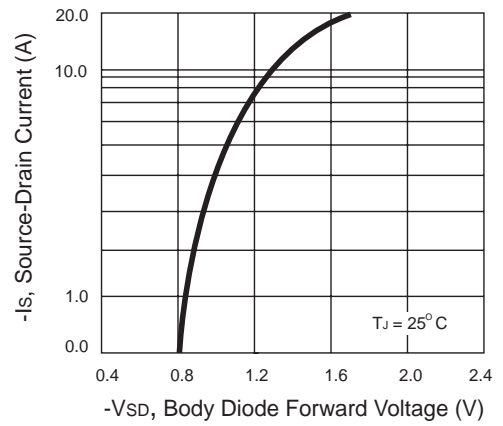


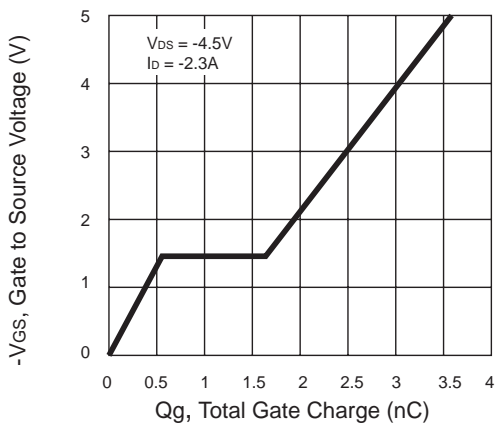
Figure 6. Breakdown Voltage Variation with Temperature



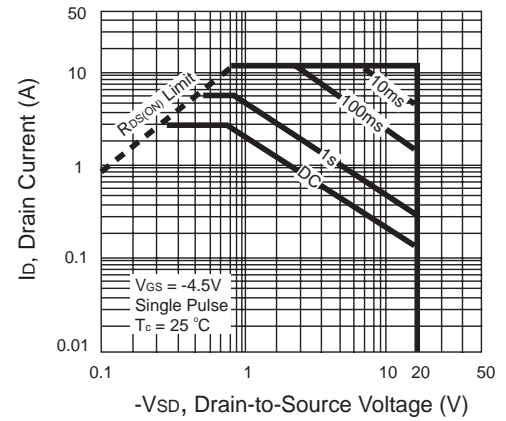
**Figure 7. Transconductance Variation with Drain Current**



**Figure 8. Body Diode Forward Voltage Variation with Source Current**



**Figure 9. Gate Charge**



**Figure 10. Maximum Safe Operating Area**

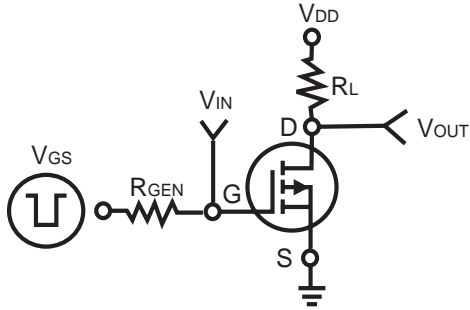


Figure 11. Switching Test Circuit

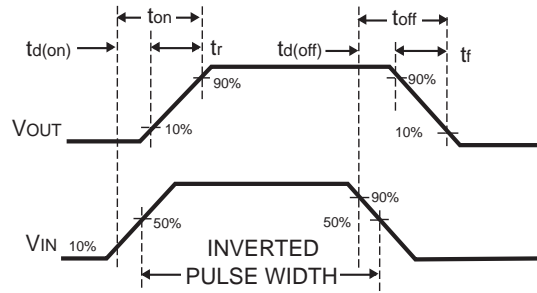


Figure 12. Switching Waveforms

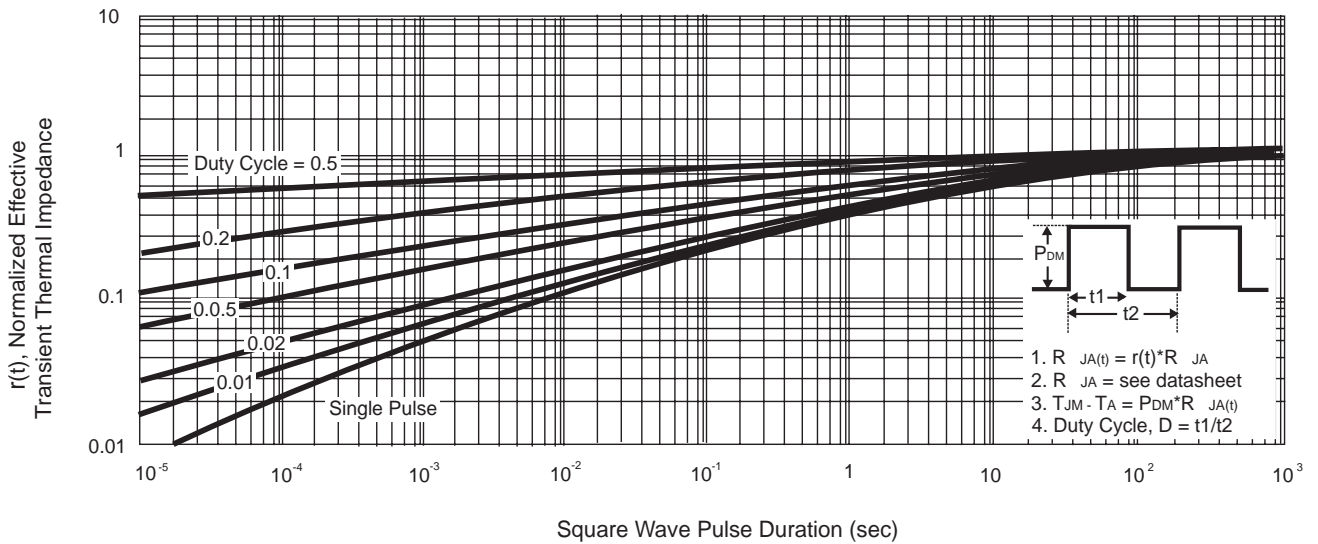
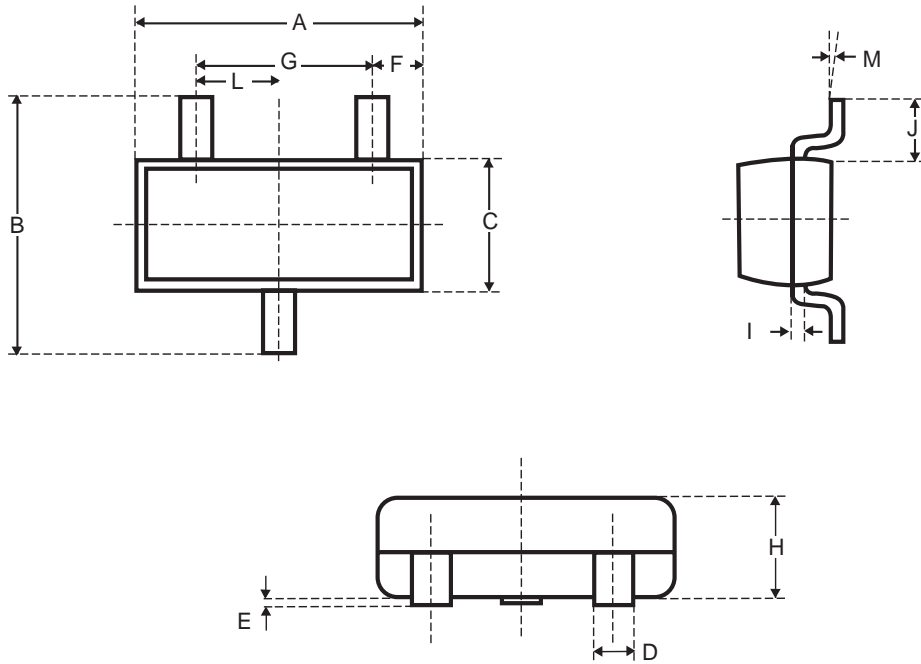


Figure 13. Normalized Thermal Transient Impedance Curve



## Package Outline Dimensions

SOT-23



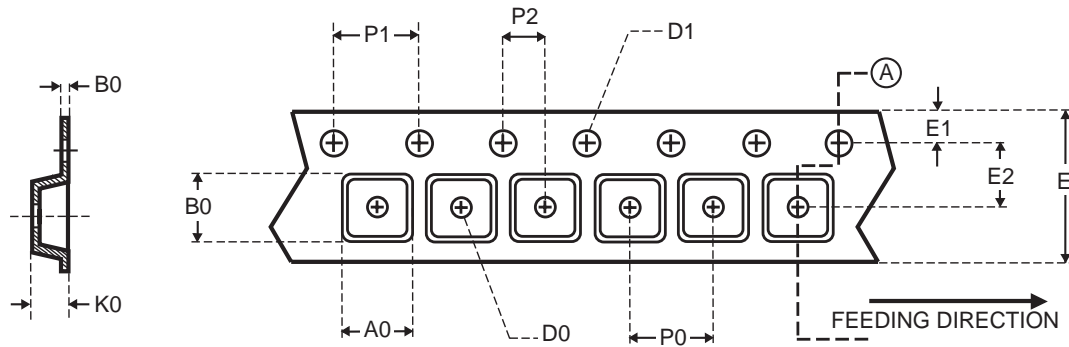
SYMBOLS	MILLIMETERS		INCHES	
	Min.	Max.	Min.	Max.
A	2.70	3.10	0.106	0.122
B	2.40	2.80	0.094	0.110
C	1.40	1.60	0.055	0.063
D	0.35	0.50	0.014	0.020
E	0	0.10	0	0.004
F	0.45	0.55	0.018	0.022
G	1.90 REF.		0.075 REF.	
H	1.00	1.30	0.039	0.051
I	0.10	0.20	0.004	0.008
J	0.40	-	0.016	-
L	0.85	1.15	0.033	0.045
M	0°	10°	0°	10°

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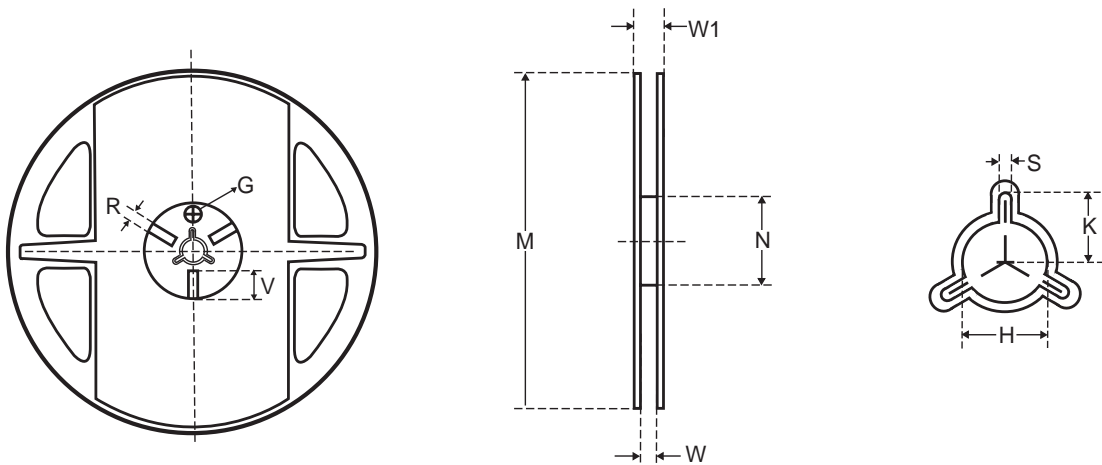
## Carrier Tape & Reel Dimensions

SOT-23



Package	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
SOT-23	3.20 ± 0.10	3.00 ± 0.10	1.33 ± 0.10	1.00 + 0.25	1.50 + 0.10	8.00 + 0.30 - 0.10	1.75 ± 0.10	3.50 ± 0.05	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	0.20 ± 0.02

UNIT : mm



Tape size	Reel Size	M	N	W	W1	H	K	S	G	R	V
8mm	178	178 ± 1	60 ± 1	9.0 ± 0.5	12.0 ± 0.5	13.5 ± 0.5	10.5	2.0 ± 0.5	10.0	5.0	18.0

UNIT : mm