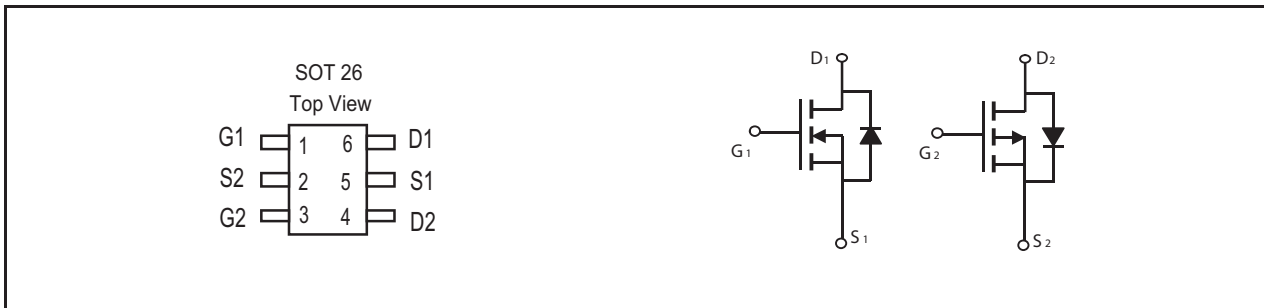




## Dual Enhancement Mode Field Effect Transistor ( N and P Channel )

PRODUCT SUMMARY (N-Channel)		
VDSS	ID	RDS(ON) (mΩ) Max
20	4A	60 @ VGS=4.5V
		75 @ VGS=2.5V

PRODUCT SUMMARY (P-Channel)		
VDSS	ID	RDS(ON) (mΩ) Max
-20V	-2.5A	138 @ VGS=-4.5V
		190 @ VGS=-2.5V



### ABSOLUTE MAXIMUM RATINGS (TA=25°C unless otherwise noted)

Symbol	Parameter	N-Channel	P-Channel	Units	
V <sub>DS</sub>	Drain-Source Voltage	20	-20	V	
V <sub>GS</sub>	Gate-Source Voltage	±12	±12	V	
I <sub>D</sub>	Drain Current-Continuous <sup>a</sup>	TA=25°C	4	-2.5	A
		TA=70°C	3.2	-2	A
I <sub>DM</sub>	-Pulsed <sup>b</sup>	10	9.4	A	
P <sub>D</sub>	Maximum Power Dissipation <sup>a</sup>	TA=25°C	1.25		W
		TA=70°C	0.8		W
T <sub>J</sub> , T <sub>STG</sub>	Operating Junction and Storage Temperature Range	-55 to 150		°C	

### THERMAL CHARACTERISTICS

R <sub>θJA</sub>	Thermal Resistance, Junction-to-Ambient <sup>a</sup>	100	°C/W
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## N-Channel ELECTRICAL CHARACTERISTICS (TA=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>OFF CHARACTERISTICS</b>						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	20			V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =16V, V <sub>GS</sub> =0V			1	uA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>GS</sub> =±12V, V <sub>DS</sub> =0V			±100	nA
<b>ON CHARACTERISTICS</b>						
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	0.5	0.74	1.5	V
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =4.5V, I <sub>D</sub> =4A		40	60	m ohm
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =3.5A		50	75	m ohm
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =5V, I <sub>D</sub> =4A		15		S
<b>DYNAMIC CHARACTERISTICS <sup>c</sup></b>						
C <sub>ISS</sub>	Input Capacitance	V <sub>DS</sub> =10V, V <sub>GS</sub> =0V f=1.0MHz		224		pF
C <sub>OSS</sub>	Output Capacitance			84		pF
C <sub>RSS</sub>	Reverse Transfer Capacitance			67		pF
<b>SWITCHING CHARACTERISTICS <sup>c</sup></b>						
t <sub>D(ON)</sub>	Turn-On Delay Time	V <sub>DD</sub> =10V I <sub>D</sub> =1A V <sub>GS</sub> =4.5V R <sub>GEN</sub> =6 ohm		8		ns
t <sub>r</sub>	Rise Time			11.5		ns
t <sub>D(OFF)</sub>	Turn-Off Delay Time			15.4		ns
t <sub>f</sub>	Fall Time			3.2		ns
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =10V, I <sub>D</sub> =4A, V <sub>GS</sub> =4.5V		5		nC
Q <sub>gs</sub>	Gate-Source Charge	V <sub>DS</sub> =10V, I <sub>D</sub> =4A, V <sub>GS</sub> =4.5V		0.85		nC
Q <sub>gd</sub>	Gate-Drain Charge			2.4		nC
<b>DRAIN-SOURCE DIODE CHARACTERISTICS</b>						
V <sub>SD</sub>	Diode Forward Voltage <sup>b</sup>	V <sub>GS</sub> =0V, I <sub>S</sub> =1.25A		0.81	1.2	V

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## P-Channel ELECTRICAL CHARACTERISTICS (TA=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>OFF CHARACTERISTICS</b>						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =-250uA	-20			V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =-16V, V <sub>GS</sub> =0V			-1	uA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>GS</sub> =±12V, V <sub>DS</sub> =0V			±100	nA
<b>ON CHARACTERISTICS</b>						
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA	-0.5	-0.7	-1.5	V
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-2.5A		110	138	m ohm
		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-2.1A		150	190	m ohm
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =-5V, I <sub>D</sub> =-2.5A		5.2		S
<b>DYNAMIC CHARACTERISTICS <sup>c</sup></b>						
C <sub>ISS</sub>	Input Capacitance	V <sub>DS</sub> =-10V, V <sub>GS</sub> =0V f=1.0MHz		290		pF
C <sub>OSS</sub>	Output Capacitance			40		pF
C <sub>RSS</sub>	Reverse Transfer Capacitance			65		pF
<b>SWITCHING CHARACTERISTICS <sup>c</sup></b>						
t <sub>D(ON)</sub>	Turn-On Delay Time	V <sub>DD</sub> =-10V I <sub>D</sub> =-1A		8		ns
t <sub>r</sub>	Rise Time			9		ns
t <sub>D(OFF)</sub>	Turn-Off Delay Time	V <sub>GS</sub> =-4.5V R <sub>GEN</sub> =6 ohm		14.5		ns
t <sub>f</sub>	Fall Time			19		ns
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =-10V, I <sub>D</sub> =-2.5A, V <sub>GS</sub> =-4.5V		2.9		nC
Q <sub>gs</sub>	Gate-Source Charge	V <sub>DS</sub> =-10V, I <sub>D</sub> =-2.5A, V <sub>GS</sub> =-4.5V		0.28		nC
Q <sub>gd</sub>	Gate-Drain Charge			1		nC
<b>DRAIN-SOURCE DIODE CHARACTERISTICS</b>						
V <sub>SD</sub>	Diode Forward Voltage <sup>b</sup>	V <sub>GS</sub> =0V, I <sub>S</sub> =-1.25A		-0.84	-1.2	V

### Notes

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

Jul, 22, 2010

## N-Channel

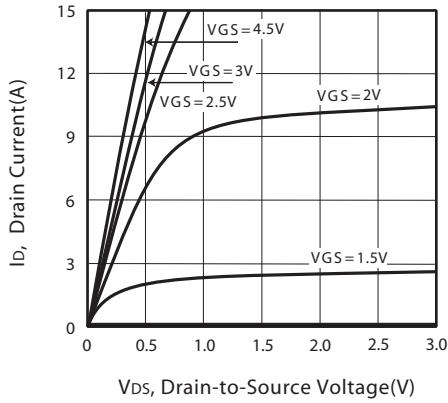


Figure 1. Output Characteristics

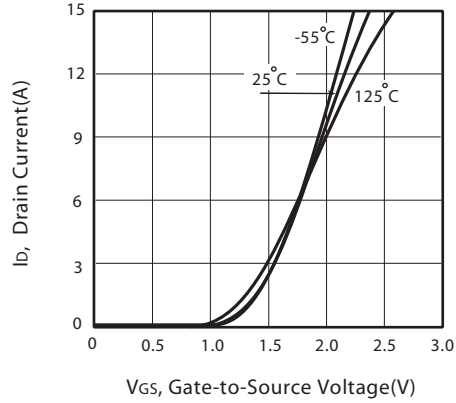


Figure 2. Transfer Characteristics

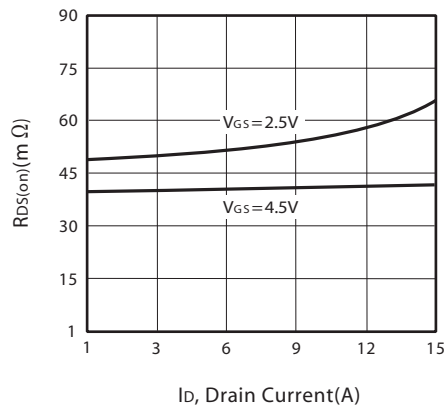


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

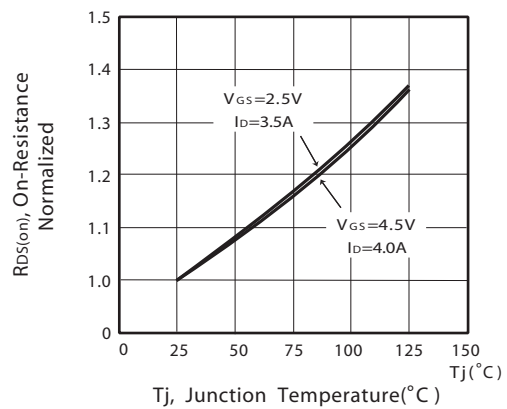


Figure 4. On-Resistance Variation with Drain Current and Temperature

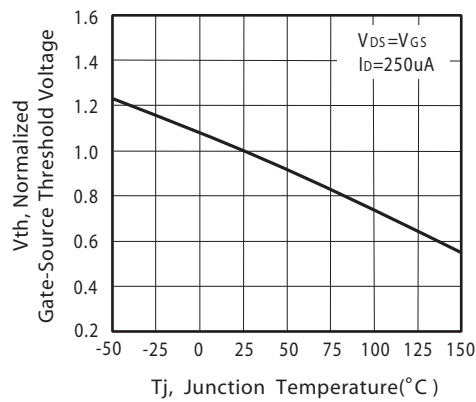


Figure 5. Gate Threshold Variation with Temperature

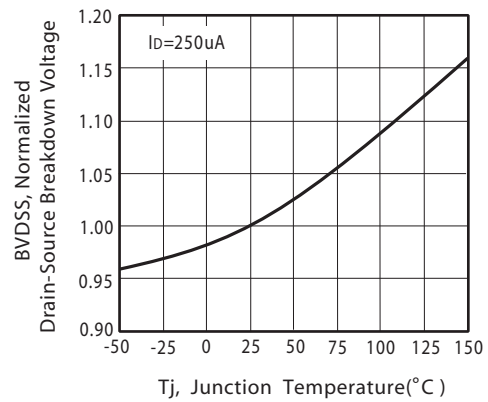


Figure 6. Breakdown Voltage Variation with Temperature

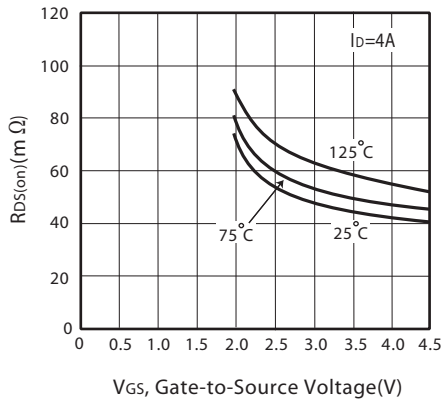


Figure 7. On-Resistance vs. Gate-Source Voltage

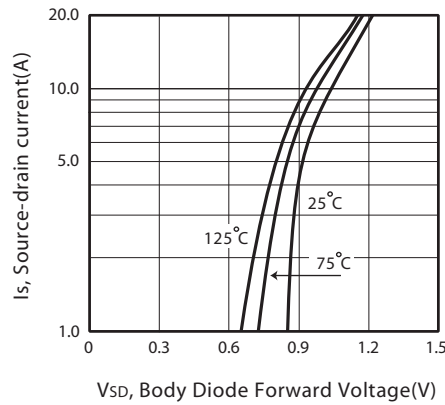


Figure 8. Body Diode Forward Voltage Variation with Source Current

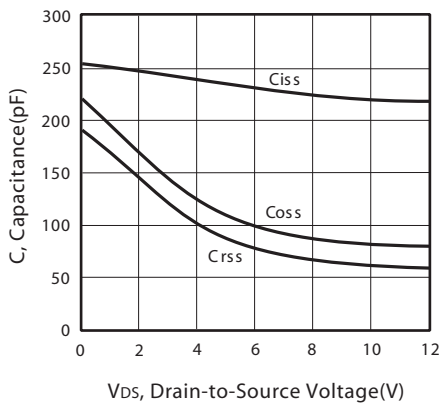


Figure 9. Capacitance

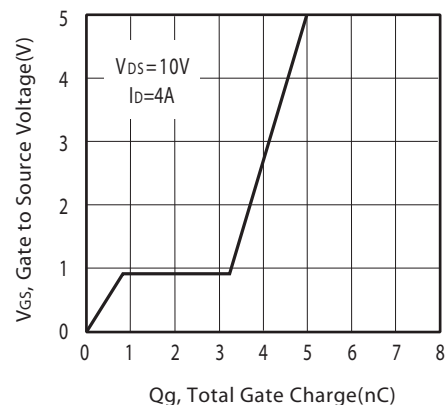


Figure 10. Gate Charge

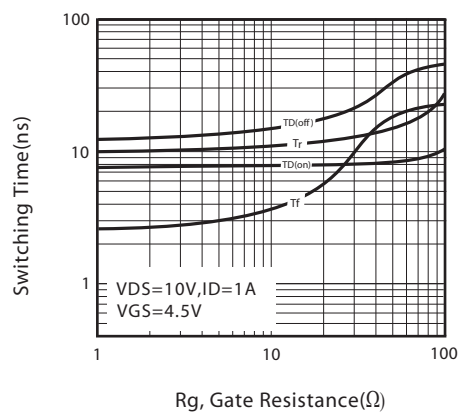


Figure 11. switching characteristics

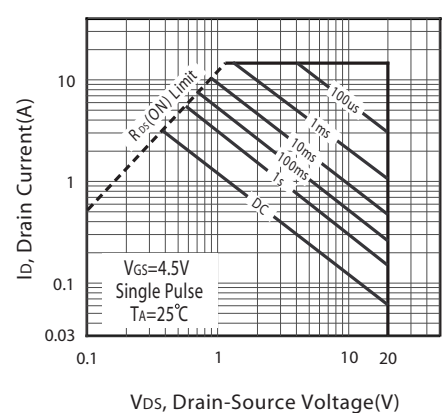
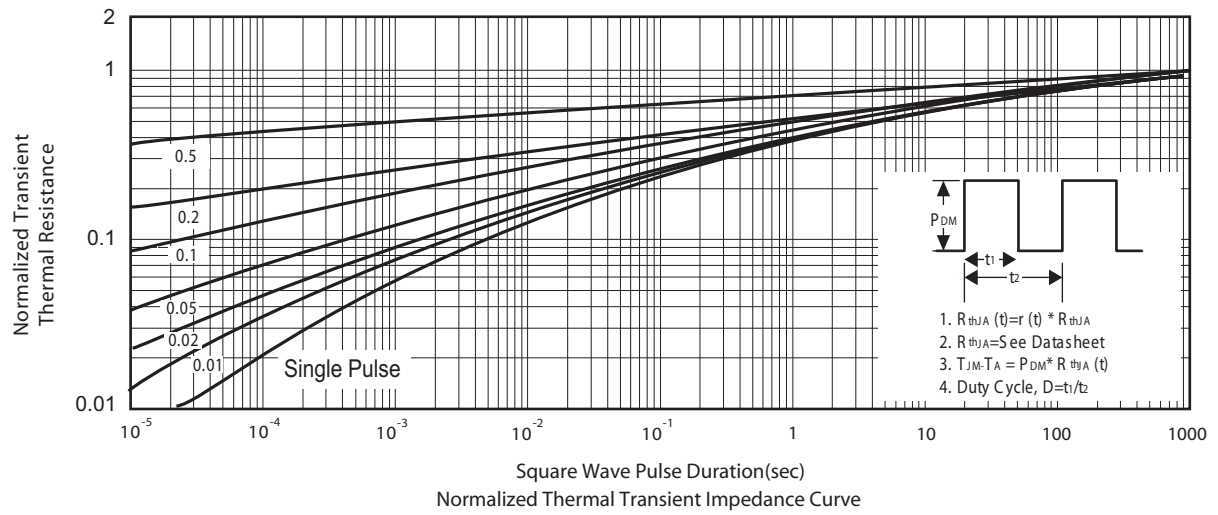


Figure 12. Maximum Safe Operating Area



P-Channel

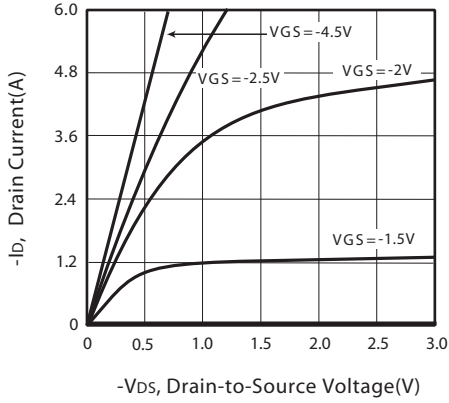


Figure 1. Output Characteristics

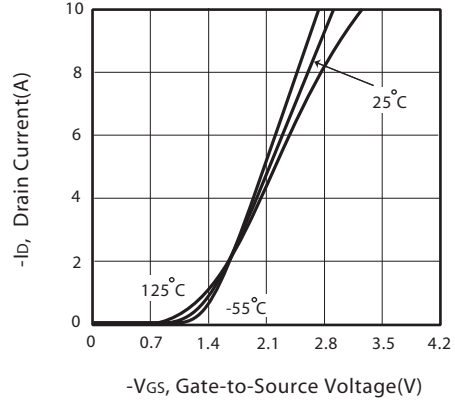


Figure 2. Transfer Characteristics

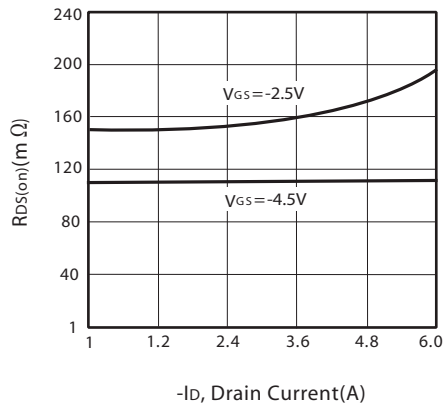


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

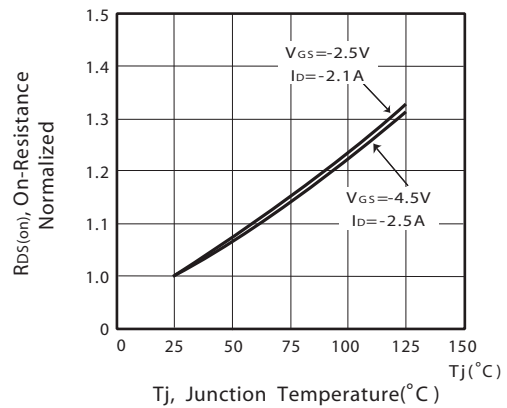


Figure 4. On-Resistance Variation with Drain Current and Temperature

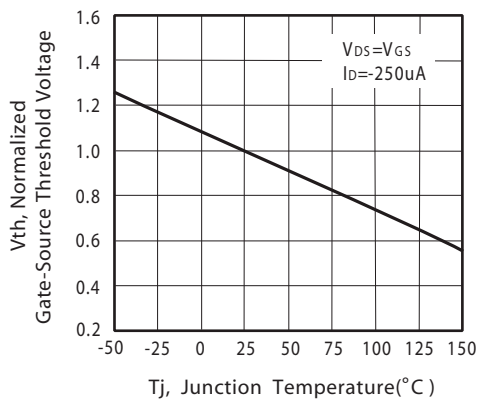


Figure 5. Gate Threshold Variation with Temperature

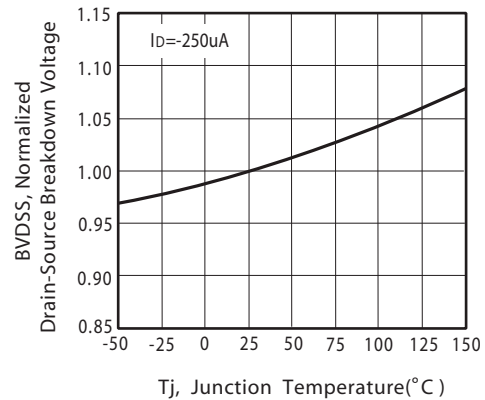


Figure 6. Breakdown Voltage Variation with Temperature

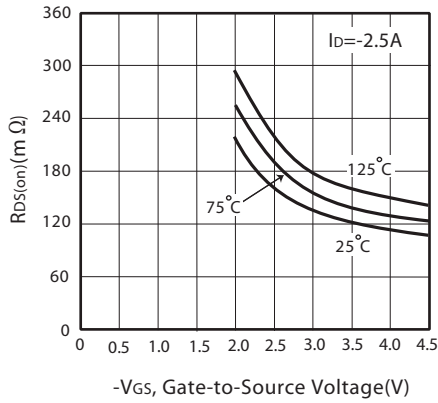


Figure 7. On-Resistance vs. Gate-Source Voltage

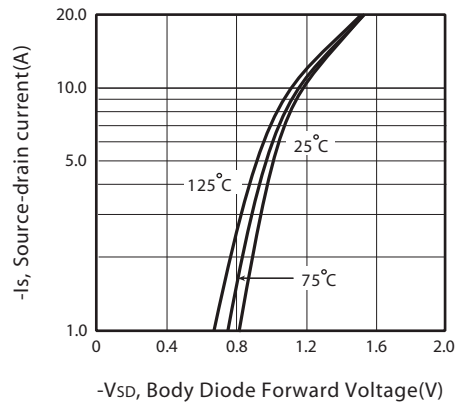


Figure 8. Body Diode Forward Voltage Variation with Source Current

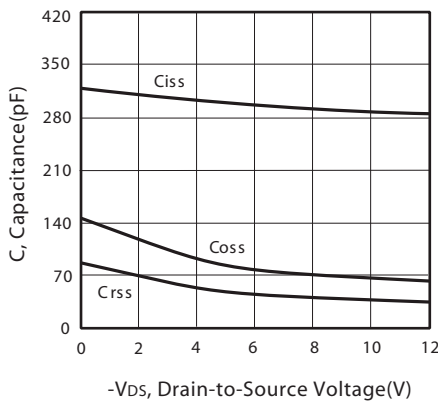


Figure 9. Capacitance

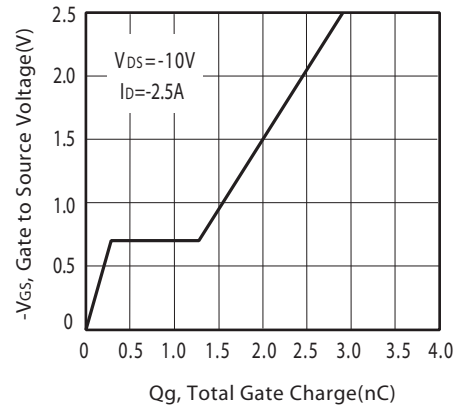


Figure 10. Gate Charge

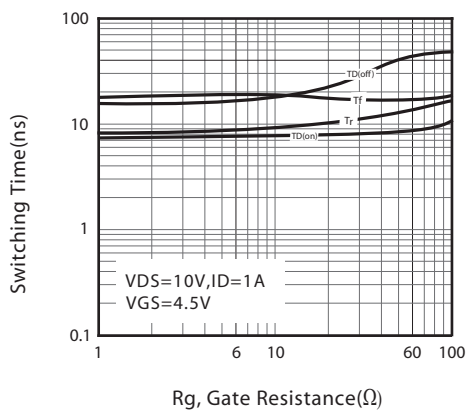


Figure 11. switching characteristics

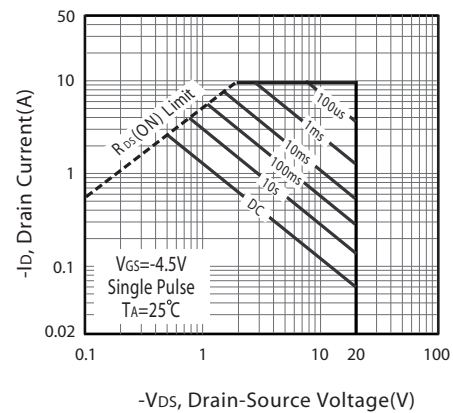
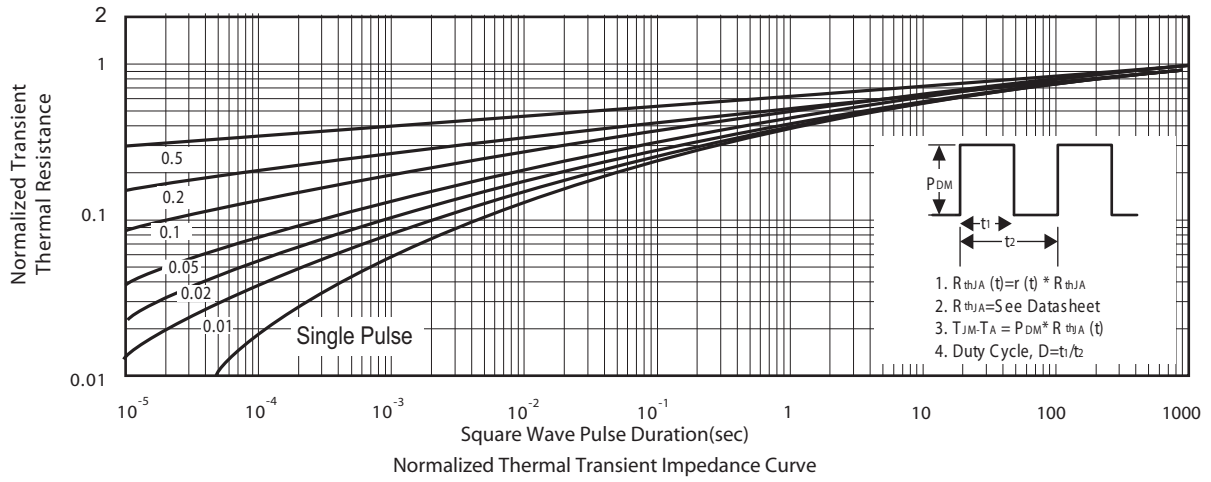
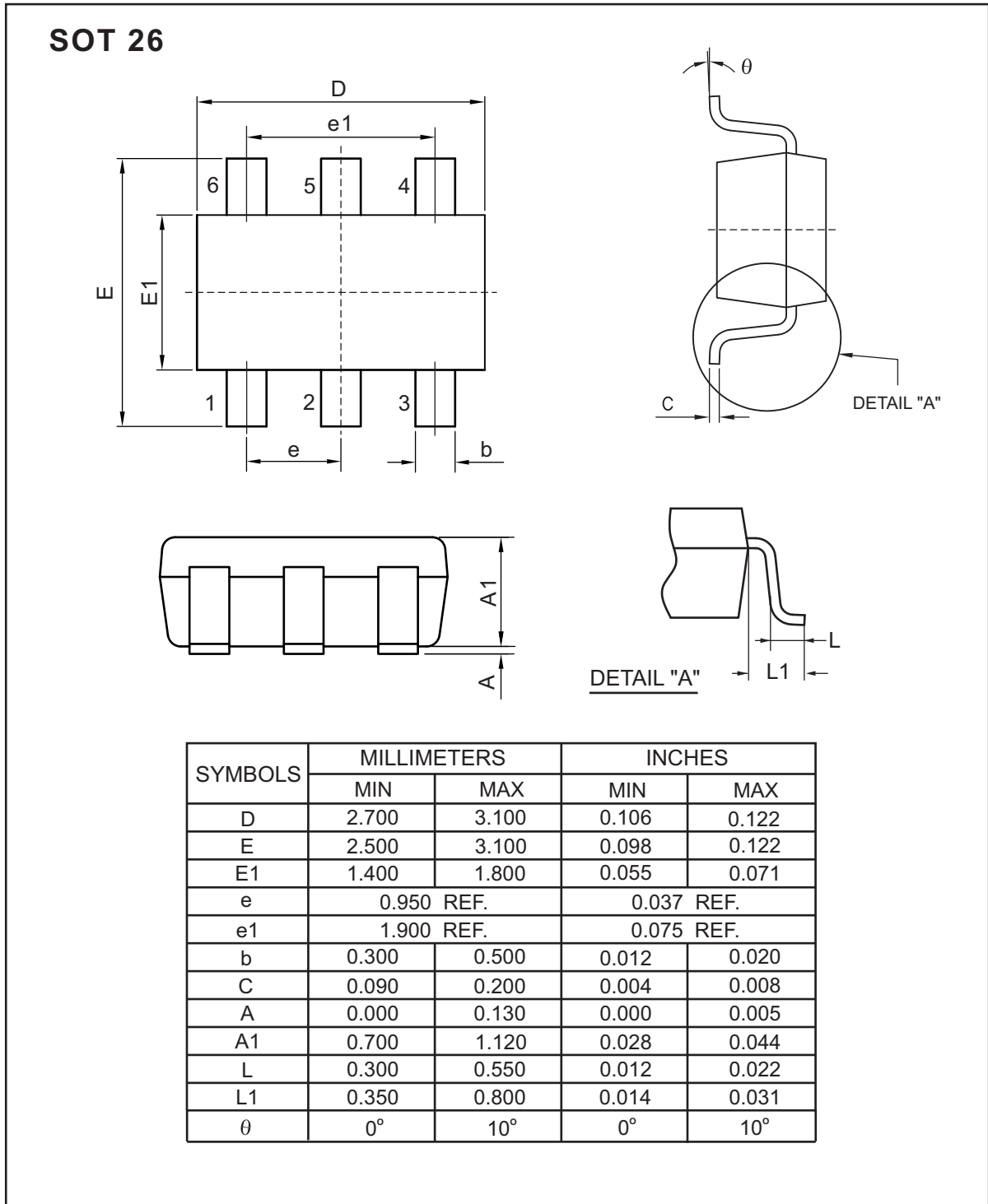


Figure 12. Maximum Safe Operating Area



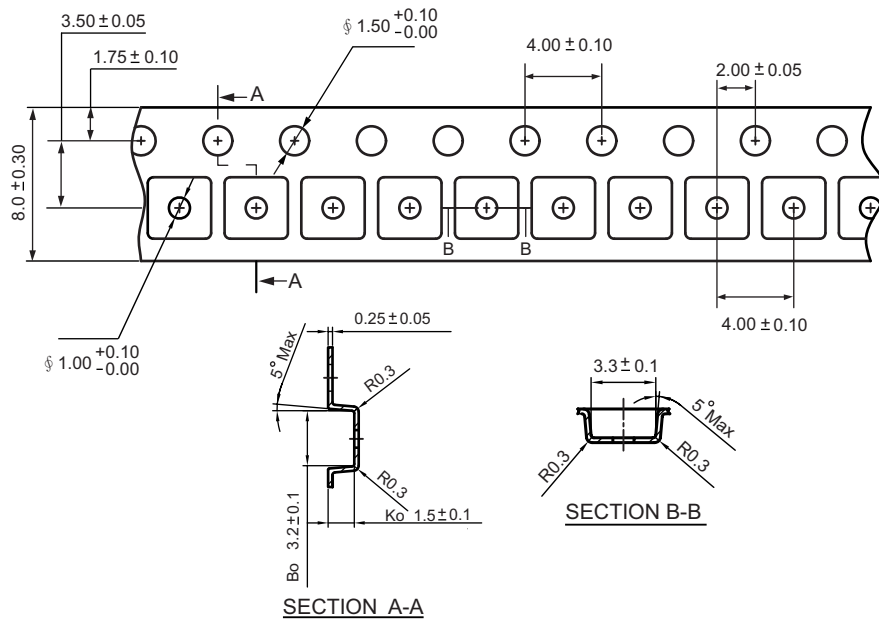


## PACKAGE OUTLINE DIMENSIONS



## SOT 26 Tape and Reel Data

### SOT 26 Carrier Tape



### SOT 26 Reel

