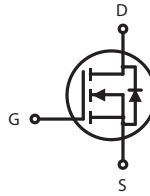
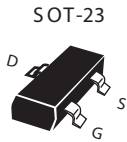


PRODUCT SUMMARY		
V <sub>DSS</sub>	I <sub>D</sub>	R <sub>DS(ON)</sub> (Ω) Max
60V	0.25A	3.0 @ V <sub>GS</sub> = 10V
		4.0 @ V <sub>GS</sub> = 5V

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V <sub>DS</sub>	60	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Drain Current-Continuous <sup>a</sup> @ T <sub>J</sub> =125°C -Pulsed <sup>b</sup>	I <sub>D</sub>	250	mA
	I <sub>DM</sub>	1.0	A
Drain-Source Diode Forward Current <sup>a</sup>	I <sub>S</sub>	250	mA
Maximum Power Dissipation <sup>a</sup>	P <sub>D</sub>	200	mW
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>thJA</sub>	625	°C/W
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**ELECTRICAL CHARACTERISTICS (TA=25 °C unless otherwise noted)**

Parameter	Symbol	Condition	Min	Typ <sup>c</sup>	Max	Unit
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 10uA	60			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 60V, V <sub>GS</sub> = 0V			1	uA
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V			±100	nA
<b>ON CHARACTERISTICS<sup>b</sup></b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250uA	1	2.0	2.5	V
Drain-Source On-State Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 250mA			3.0	ohm
		V <sub>GS</sub> = 5V, I <sub>D</sub> = 50mA			4.0	ohm
On-State Drain Current	I <sub>D(ON)</sub>	V <sub>DS</sub> = 7V, V <sub>GS</sub> = 10V	500			mA
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> = 7V, I <sub>D</sub> = 200mA	80			mS
<b>DYNAMIC CHARACTERISTICS<sup>c</sup></b>						
Input Capacitance	C <sub>ISS</sub>	V <sub>DS</sub> = 25V, V <sub>GS</sub> = 0V f = 1.0MHz		19	50	pF
Output Capacitance	C <sub>OSS</sub>			10	25	pF
Reverse Transfer Capacitance	C <sub>RSS</sub>			3	5	pF
<b>SWITCHING CHARACTERISTICS<sup>c</sup></b>						
Turn-On Delay Time	t <sub>D(ON)</sub>	V <sub>DD</sub> = 30V, I <sub>D</sub> = 100mA, V <sub>GS</sub> = 10V, R <sub>GEN</sub> = 10 ohm		7.5	20	ns
Rise Time	t <sub>r</sub>			6		ns
Turn-Off Delay Time	t <sub>D(OFF)</sub>			7.5	20	ns
Fall Time	t <sub>f</sub>			3		ns

ELECTRICAL CHARACTERISTICS ( $T_A=25^{\circ}\text{C}$  unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ <sup>c</sup>	Max	Unit
<b>DRAIN-SOURCE DIODE CHARACTERISTICS<sup>b</sup></b>						
Diode Forward Voltage	$V_{SD}$	$V_{GS} = 0V, I_S = 115mA$		0.76	1.5	V

Notes

- a. Surface Mounted on FR4 Board,  $t \leq 10\text{sec}$ .
- b. Pulse Test: Pulse Width  $\leq 300\ \mu\text{s}$ , Duty Cycle  $\leq 2\%$ .
- c. Guaranteed by design, not subject to production testing.

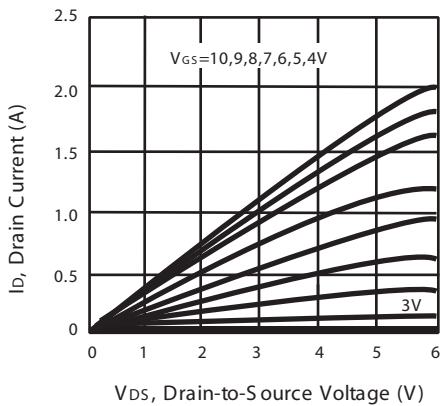


Figure 1. Output Characteristics

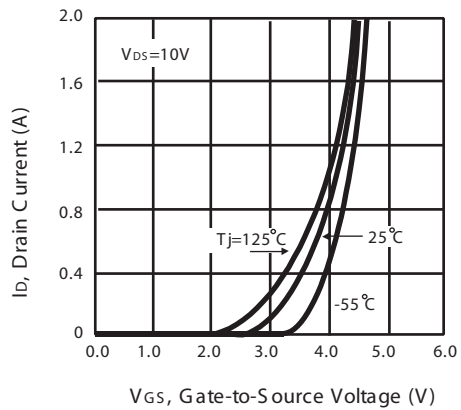


Figure 2. Transfer Characteristics

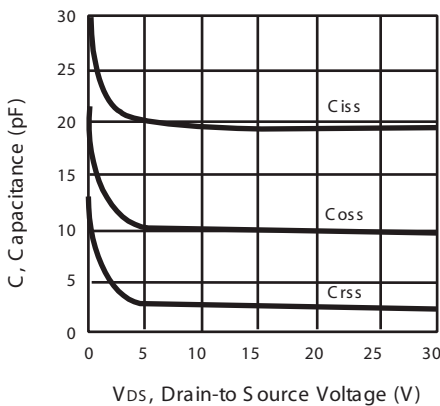


Figure 3. Capacitance

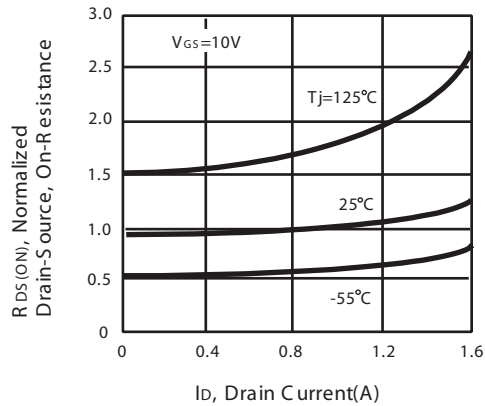


Figure 4. On-Resistance Variation with Drain Current and Temperature

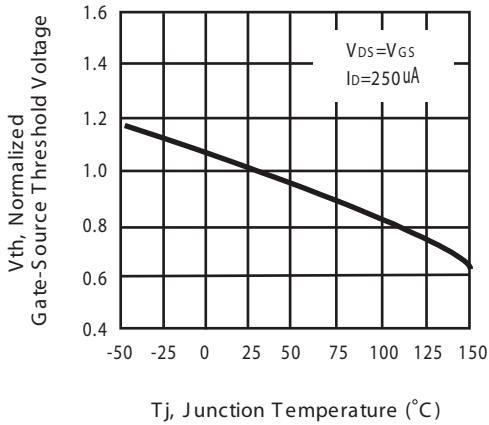


Figure 5. Gate Threshold Variation with Temperature

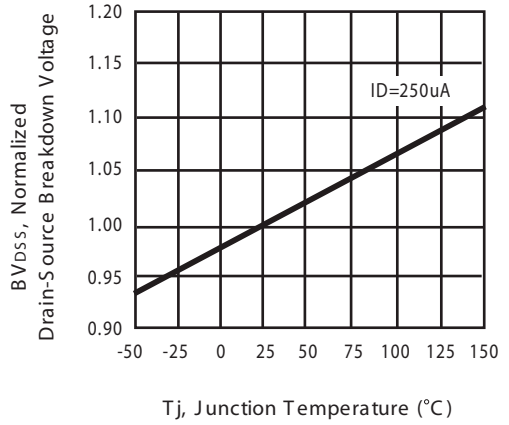


Figure 6. Breakdown Voltage Variation with Temperature

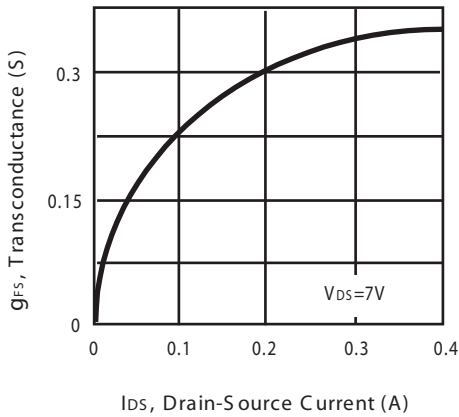


Figure 7. Transconductance Variation with Drain Current

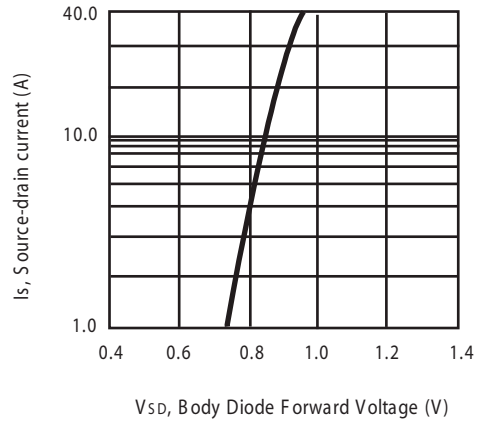


Figure 8. Body Diode Forward Voltage Variation with Source Current

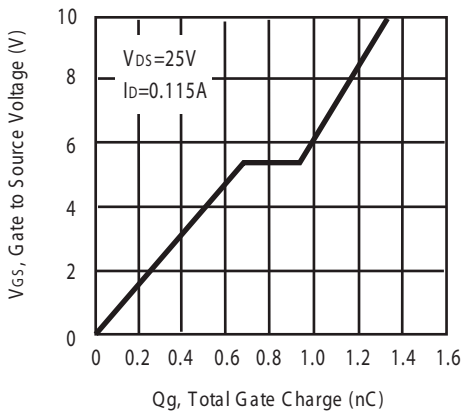


Figure 9. Gate Charge

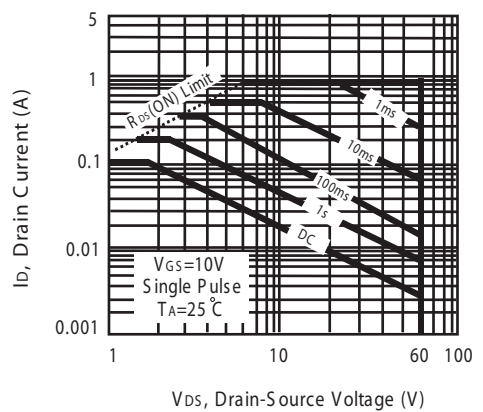


Figure 10. Maximum Safe Operating Area



2N7002E 250mA 60V N-Channel Enhancement-Mode Field Transistor

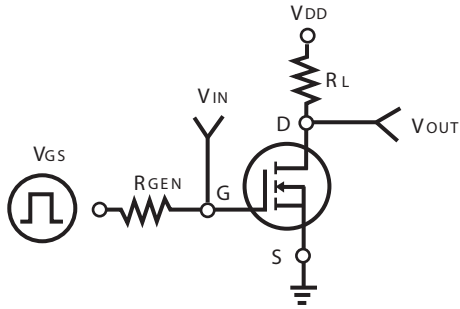


Figure 11. S switching Test Circuit

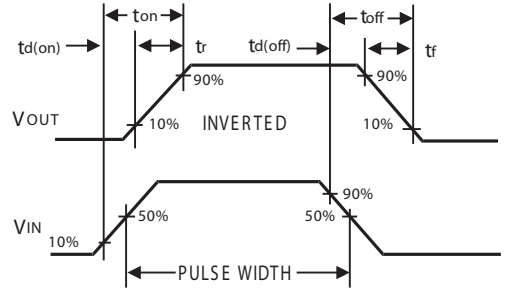


Figure 12. S switching Waveforms

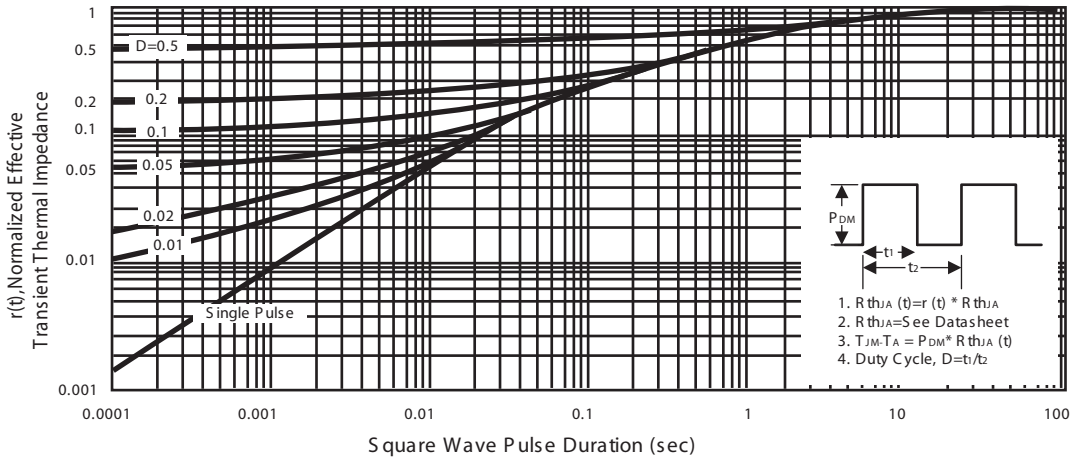


Figure 13. Normalized Thermal Transient Impedance Curve