



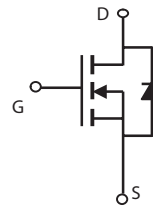
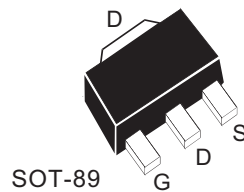
## N-Channel Enhancement Mode Field Effect Transistor

### PRODUCT SUMMARY

V <sub>DSS</sub>	I <sub>D</sub>	R <sub>DS(ON)</sub> (mΩ) Max
100V	2.0A	210 @ V <sub>GS</sub> =10V
		312 @ V <sub>GS</sub> =4.5V

### FEATURES

- Super high dense cell design for low R<sub>DS(ON)</sub>.
- Rugged and reliable.
- Surface Mount Package.



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

Symbol	Parameter	Limit	Units
V <sub>DS</sub>	Drain-Source Voltage	100	V
V <sub>GS</sub>	Gate-Source Voltage	±20	V
I <sub>D</sub>	Drain Current-Continuous <sup>a</sup>	T <sub>A</sub> =25°C	2.0
		T <sub>A</sub> =70°C	1.6
I <sub>DM</sub>	-Pulsed <sup>b</sup>	11	A
E <sub>AS</sub>	Single Pulse Avalanche Energy <sup>d</sup>	20	mJ
P <sub>D</sub>	Maximum Power Dissipation	T <sub>A</sub> =25°C	1.25
		T <sub>A</sub> =70°C	0.8
T <sub>J</sub> , T <sub>STG</sub>	Operating Junction and Storage Temperature Range	-55 to 150	°C

### THERMAL CHARACTERISTICS

Symbol	Parameter	Limit	Units
R <sub>θJA</sub>	Thermal Resistance, Junction-to-Ambient	100	°C/W

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>OFF CHARACTERISTICS</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	100			V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=80V, V_{GS}=0V$			1	$\mu A$
$I_{GSS}$	Gate-Body Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$			$\pm 100$	nA
<b>ON CHARACTERISTICS</b>						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1	1.9	2.5	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	$V_{GS}=10V, I_D=1.00A$		168	210	m ohm
		$V_{GS}=4.5V, I_D=0.82A$		231	312	m ohm
$g_{FS}$	Forward Transconductance	$V_{DS}=10V, I_D=1.00A$		1.9		S
<b>DYNAMIC CHARACTERISTICS <sup>c</sup></b>						
$C_{ISS}$	Input Capacitance	$V_{DS}=25V, V_{GS}=0V$ $f=1.0MHz$		310		pF
$C_{OSS}$	Output Capacitance			38		pF
$C_{RSS}$	Reverse Transfer Capacitance			24		pF
<b>SWITCHING CHARACTERISTICS <sup>c</sup></b>						
$t_{D(ON)}$	Turn-On Delay Time	$V_{DD}=50V$ $I_D=1.00A$ $V_{GS}=10V$ $R_{GEN}=6\text{ ohm}$		7.7		ns
$t_r$	Rise Time			9.2		ns
$t_{D(OFF)}$	Turn-Off Delay Time			16		ns
$t_f$	Fall Time			4.1		ns
$Q_g$	Total Gate Charge	$V_{DS}=50V, I_D=1.00A, V_{GS}=10V$		5.6		nC
		$V_{DS}=50V, I_D=1.00A, V_{GS}=4.5V$		3.3		nC
$Q_{gs}$	Gate-Source Charge	$V_{DS}=50V, I_D=1.00A,$		0.9		nC
$Q_{gd}$	Gate-Drain Charge	$V_{GS}=10V$		1.7		nC
<b>DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS</b>						
$V_{SD}$	Diode Forward Voltage	$V_{GS}=0V, I_S=1A$		0.79	1.3	V

**Notes**

- Surface Mounted on FR4 Board,  $t \leq 10\text{sec}$ .
- Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .
- Guaranteed by design, not subject to production testing.
- Starting  $T_J=25^{\circ}\text{C}, L=0.5\text{mH}, V_{DD}=50V$ . (See Figure13)

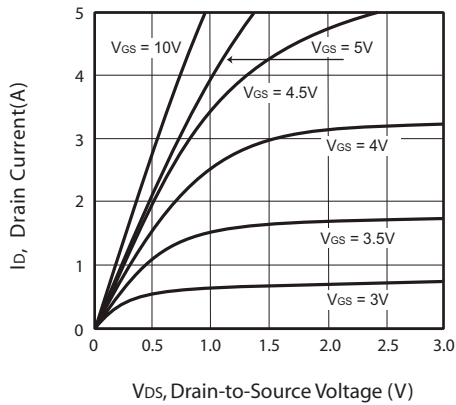


Figure 1. Output Characteristics

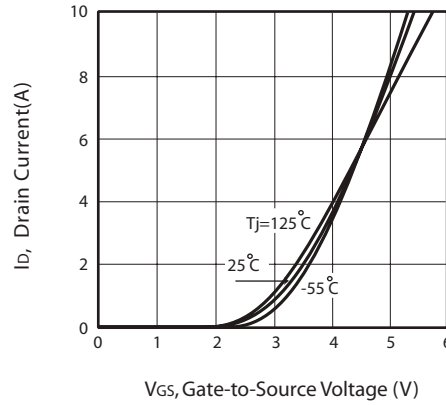


Figure 2. Transfer Characteristics

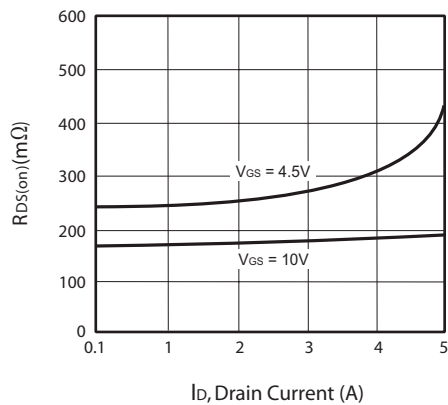


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

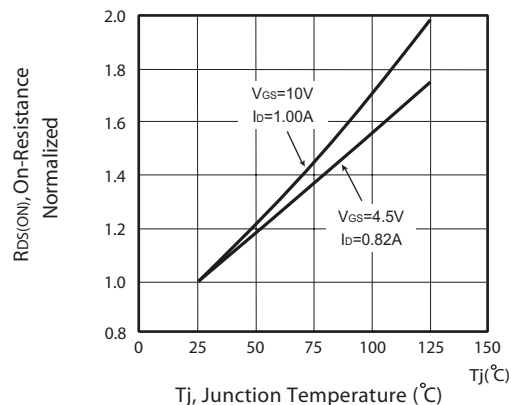


Figure 4. On-Resistance Variation with Drain Current and Temperature

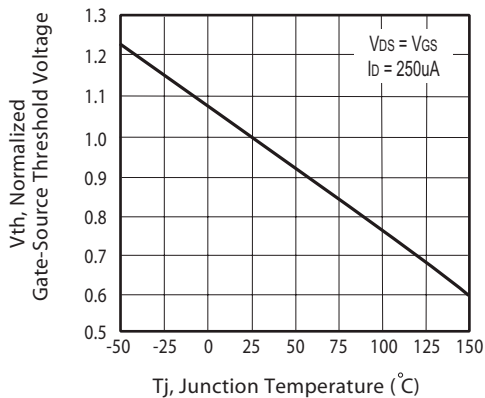


Figure 5. Gate Threshold Variation with Temperature

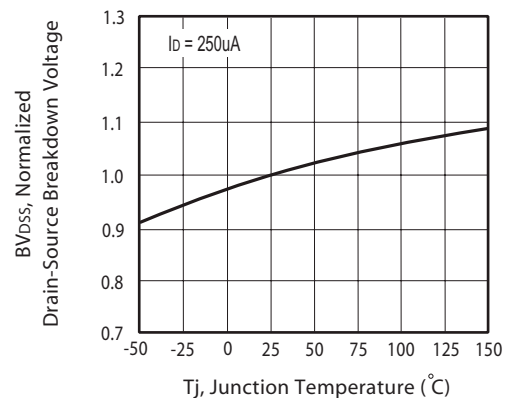


Figure 6. Breakdown Voltage Variation with Temperature

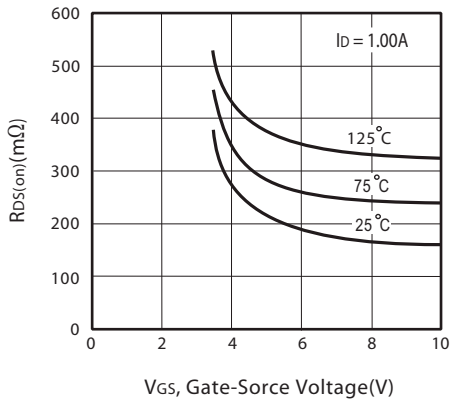


Figure 7. On-Resistance vs. Gate-Source Voltage

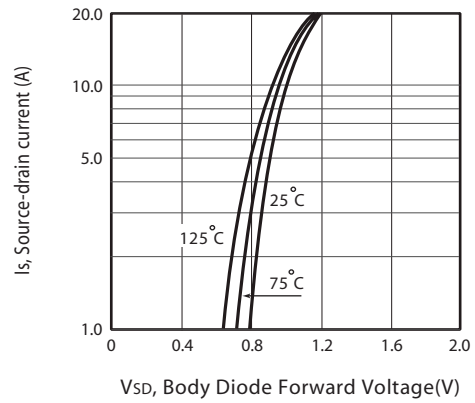


Figure 8. Body Diode Forward Voltage Variation with Source Current

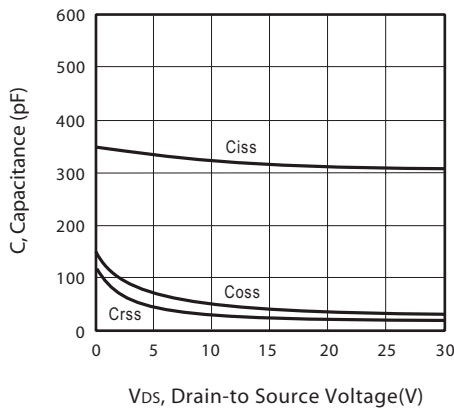


Figure 9. Capacitance

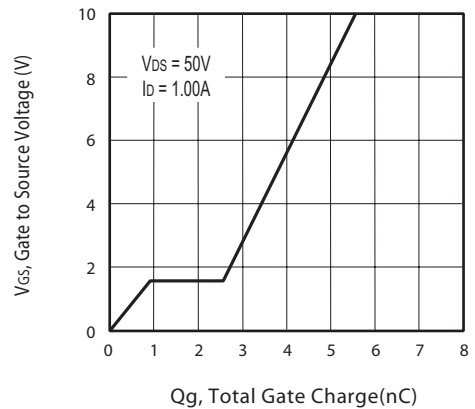


Figure 10. Gate Charge

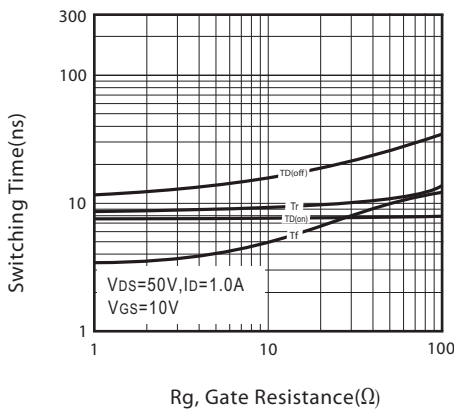


Figure 11. switching characteristics

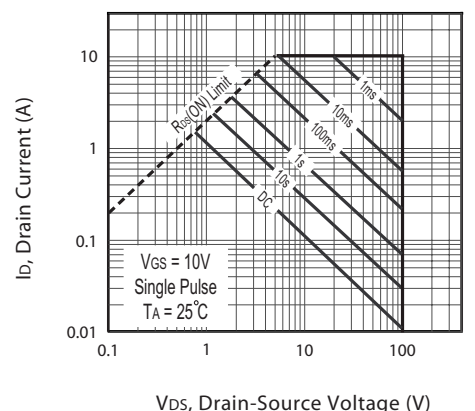
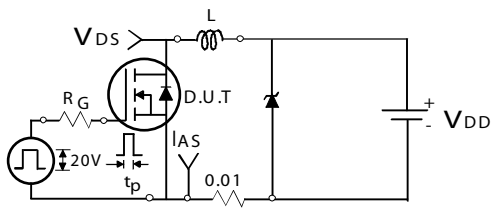
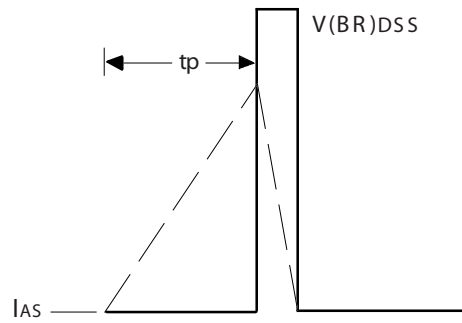


Figure 12. Maximum Safe Operating Area



Unclamped Inductive Test Circuit

Figure 13a.



Unclamped Inductive Waveforms

Figure 13b.

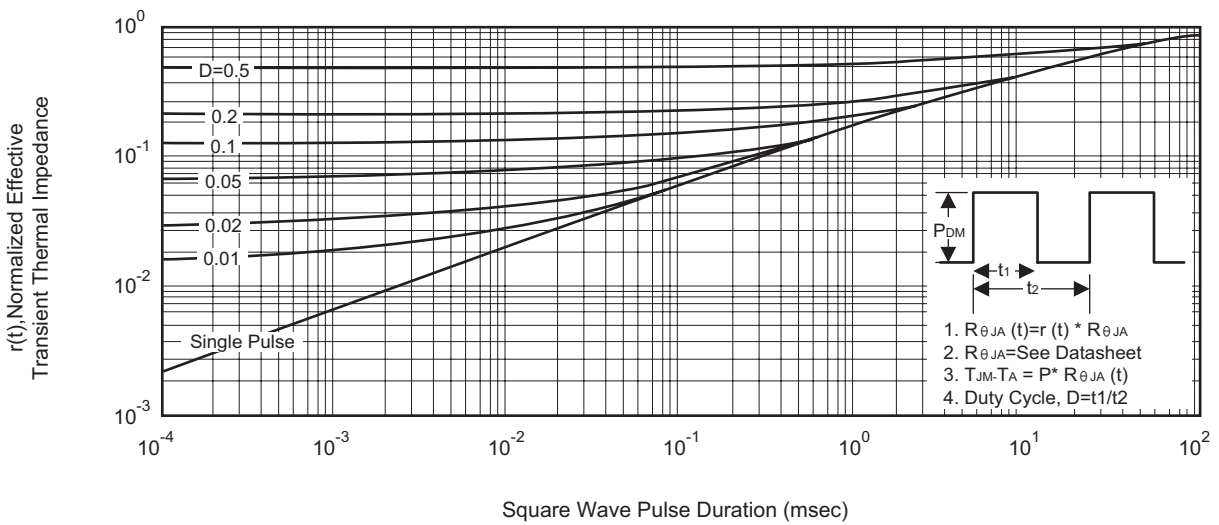
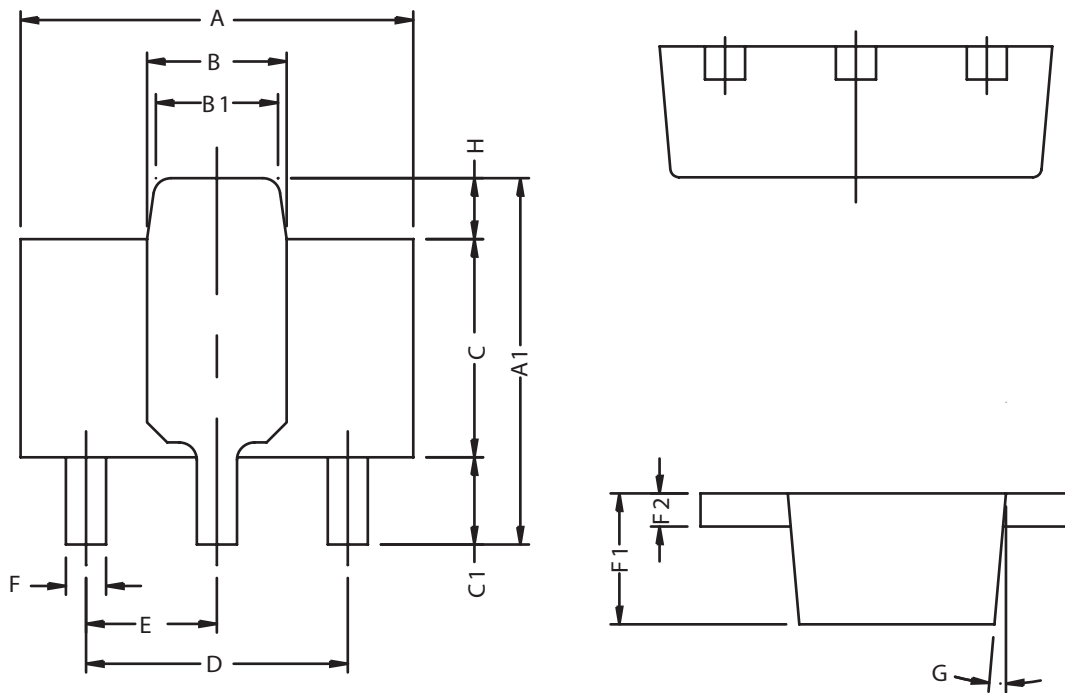


Figure 14. Normalized Thermal Transient Impedance Curve

## PACKAGE OUTLINE DIMENSIONS

### SOT-89



REF.	DIMENSIONS	
	Milimeters	
	MIN.	MAX.
A	4.40	4.60
A1	4.05	4.25
B	1.50	1.70
B1	1.30	1.50
C	2.40	2.60
C1	0.89	1.20
D	3.00 REF.	
E	1.50 REF.	
F	0.40	0.52
F1	1.40	1.60
F2	0.35	0.41
G	5° TYP.	
H	0.70 REF.	

