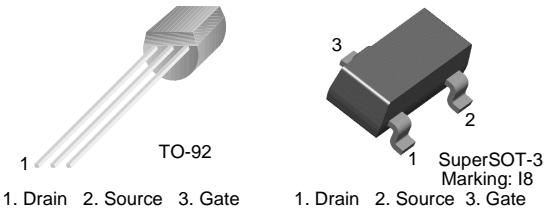




## J108/J109/J110/MMBFJ108

### N-Channel Switch

- This device is designed for digital switching applications where very low on resistance is mandatory.
- Sourced from Process 58.



### Absolute Maximum Ratings \* $T_A=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Value	Units
$V_{DG}$	Drain-Gate Voltage	25	V
$V_{GS}$	Gate-Source Voltage	-25	V
$I_{GF}$	Forward Gate Current	10	mA
$T_J, T_{stg}$	Operating and Storage Junction Temperature Range	-55 ~ +150	°C

\* These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

#### NOTES:

- These ratings are based on a maximum junction temperature of 150 degrees C.
- These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

### Electrical Characteristics $T_A=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Max.	Units
<b>Off Characteristics</b>					
$V_{(BR)GSS}$	Gate-Source Breakdown Voltage	$I_G = -10\mu\text{A}, V_{DS} = 0$	-25		V
$I_{GSS}$	Gate Reverse Current	$V_{GS} = -15\text{V}, V_{DS} = 0$ $V_{GS} = -15\text{V}, V_{DS} = 0, T_A = 100^\circ\text{C}$		-3.0 -200	nA nA
$V_{GS(\text{off})}$	Gate-Source Cutoff Voltage	$V_{DS} = 15\text{V}, I_D = 10\text{nA}$	108 109 110	-3.0 -2.0 -0.5	V V V
<b>On Characteristics</b>					
$I_{DSS}$	Zero-Gate Voltage Drain Current *	$V_{DS} = 15\text{V}, I_{GS} = 0$	108 109 110	80 40 10	mA mA mA
$r_{DS(\text{on})}$	Drain-Source On Resistance	$V_{DS} \leq 0.1\text{V}, V_{GS} = 0$	108 109 110	8.0 12 18	Ω Ω Ω
<b>Small Signal Characteristics</b>					
$C_{dg(\text{on})}$ $C_{sg(\text{off})}$	Drain Gate & Source Gate On Capacitance	$V_{DS} = 0, V_{GS} = 0, f = 1.0\text{MHz}$		85	pF
$C_{dg(\text{on})}$	Drain-Gate Off Capacitance	$V_{DS} = 0, V_{GS} = -10, f = 1.0\text{MHz}$		15	pF
$C_{sg(\text{off})}$	Source-Gate Off Capacitance	$V_{DS} = 0, V_{GS} = -10, f = 1.0\text{MHz}$		15	pF

\* Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$

**Thermal Characteristics**  $T_A=25^\circ\text{C}$  unless otherwise noted

Symbol	Parameter	Max.		Units
		J108 - 110	*MMBFJ108	
$P_D$	Total Device Dissipation Derate above $25^\circ\text{C}$	625 5.0	350 2.8	mW mW/ $^\circ\text{C}$
$R_{\theta JC}$	Thermal Resistance, Junction to Case	125		$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	357	556	$^\circ\text{C/W}$

\* Device mounted on FR-4 PCB 1.6" x 1.6" x 0.06"

## Typical Characteristics

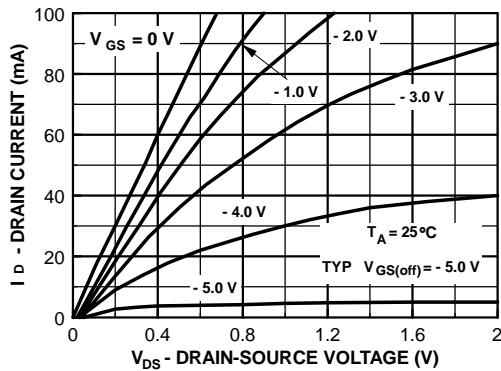


Figure 1. Common Drain-Source

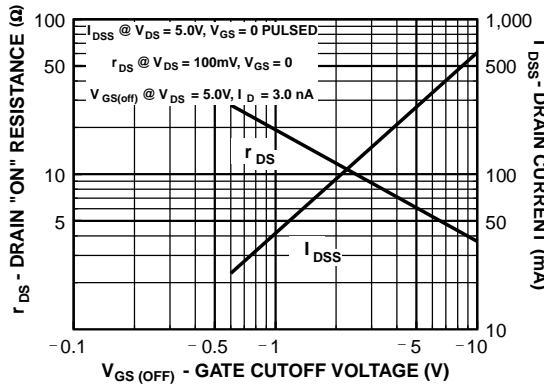


Figure 2. Parameter Interactions

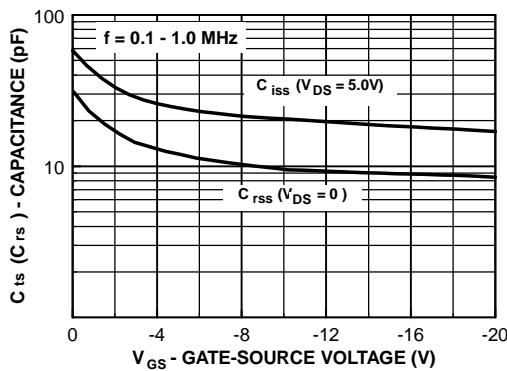


Figure 3. Common Drain-Source

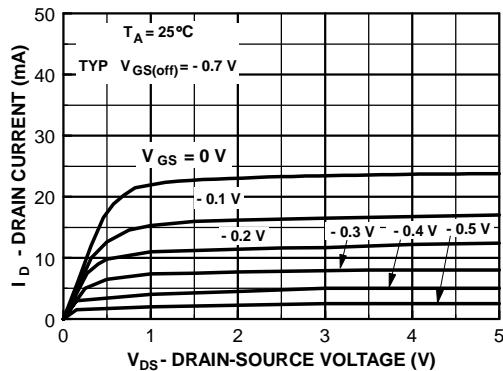


Figure 4. Common Drain-Source

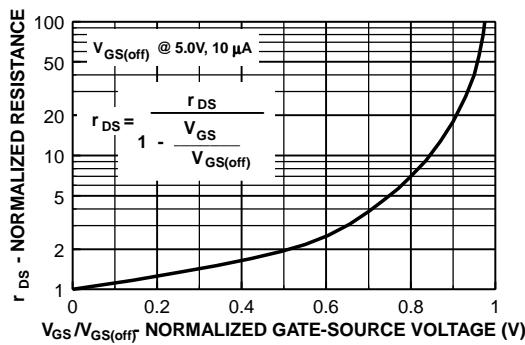


Figure 5. Normalized Drain Resistance vs Bias Voltage

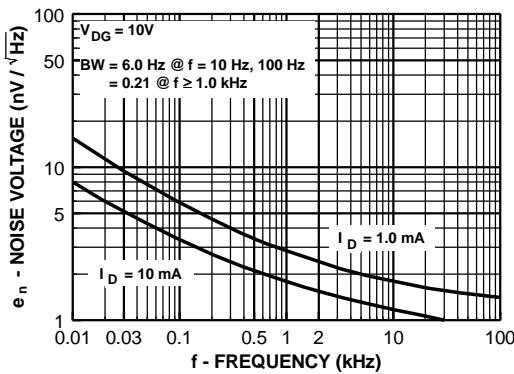
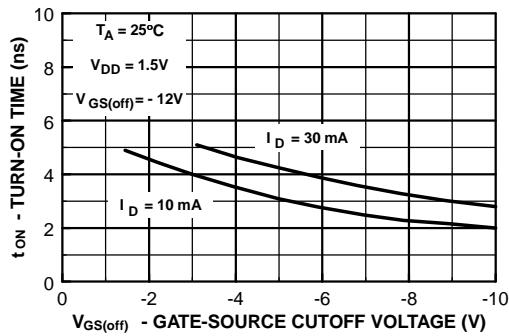
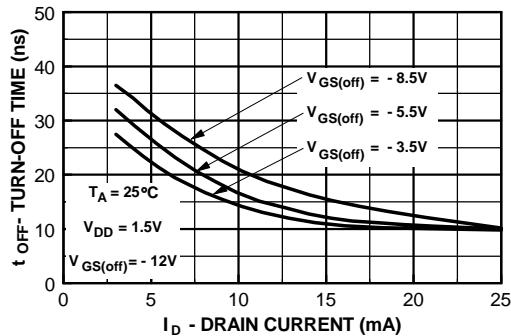


Figure 6. Noise Voltage vs Frequency

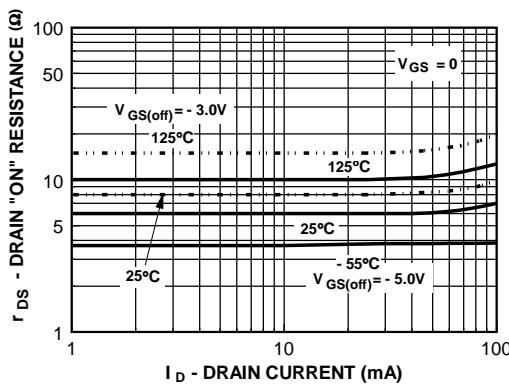
## Typical Characteristics (Continued)



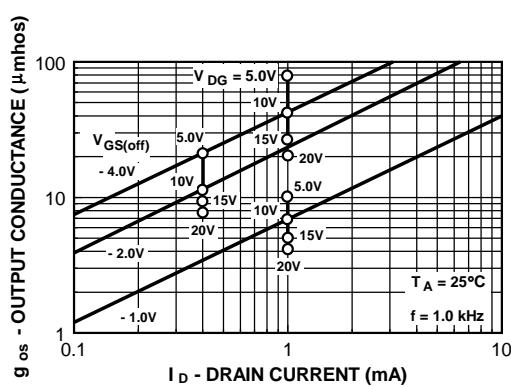
**Figure 7.** Switching Turn-On Time vs Gate-Source Cutoff Voltage



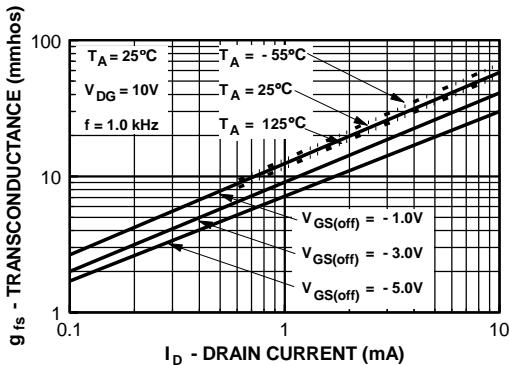
**Figure 8.** Switching Turn-On Time vs Drain Current



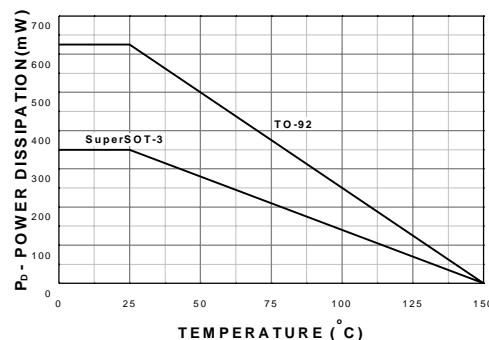
**Figure 9.** On Resistance vs Drain Current



**Figure 10.** Output Conductance vs Drain Current



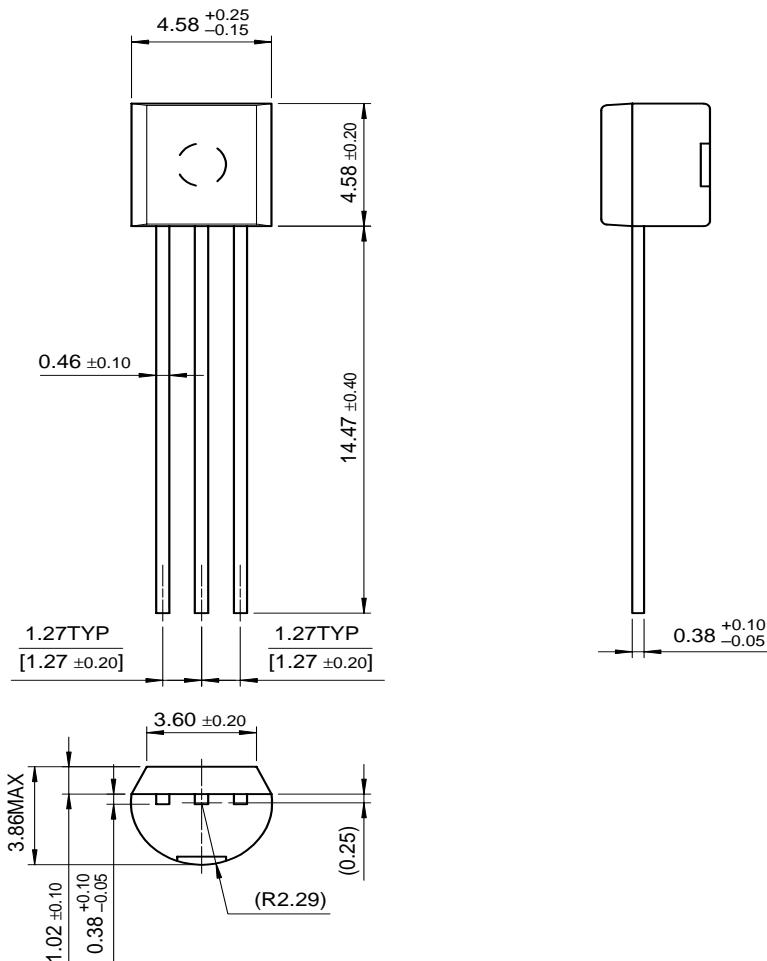
**Figure 11.** Transconductance vs Drain Current



**Figure 12.** Power Dissipation vs Ambient Temperature

## Package Dimensions

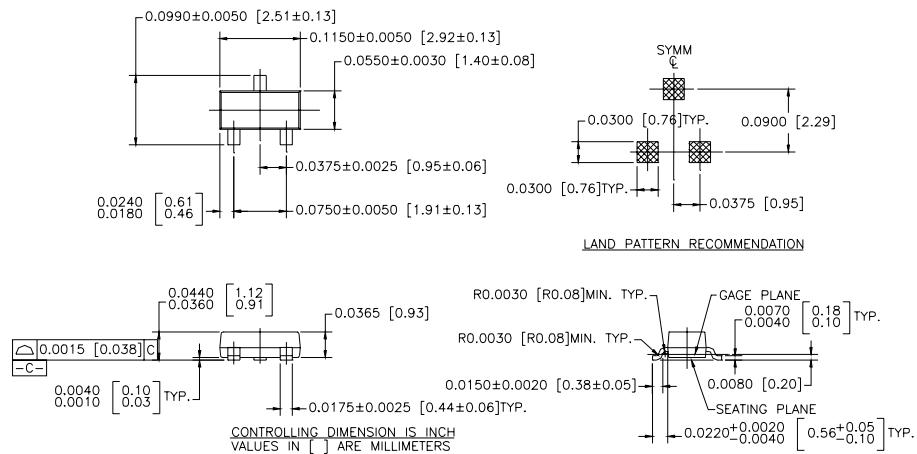
TO-92



Dimensions in Millimeters

## Package Dimensions (Continued)

### SuperSOT-3



Dimensions in Millimeters

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CoolFET™	FASTR™	MicroFET™	PowerTrench®	SuperSOT™-6
CROSSVOLT™	FRFET™	MicroPak™	QFET™	SuperSOT™-8
DOME™	GlobalOptoisolator™	MICROWIRE™	QS™	SyncFET™
EcoSPARK™	GTO™	MSX™	QT Optoelectronics™	TinyLogic™
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EnSigna™	I <sup>2</sup> C™	OCX™	RapidConfigure™	UHC™
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Programmable Active Droop™		OPTOPLANAR™	SMART START™	

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