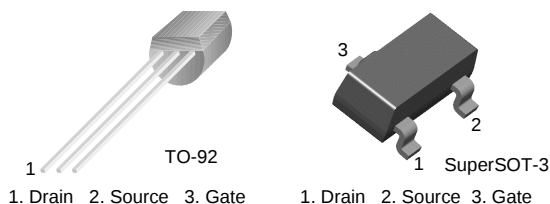


J108/J109/J110/MMBFJ108

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	$^{\circ}\text{C}$

* 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.	Typ.	Max.	Units
Off Characteristics						
$V_{(BR)GSS}$	Gate-Source Breakdwn Voltage	$I_G = -10\mu\text{A}, V_{DS} = 0$	-25			V
I_{GSS}	Gate Reverse Current	$V_{GS} = -15\text{V}, V_{DS} = 0$			-3.0	nA
		$V_{GS} = -15\text{V}, V_{DS} = 0, T_A = 100^{\circ}\text{C}$			-200	nA
$V_{GS(off)}$	Gate-Source Cutoff Voltage	$V_{DS} = 15\text{V}, I_D = 10\text{nA}$	108	-3.0	-10	V
			109	-2.0	-6.0	V
			110	-0.5	-4.0	V
On Characteristics						
I_{DSS}	Zero-Gate Voltage Drain Current *	$V_{DS} = 15\text{V}, I_{GS} = 0$	108	80		mA
			109	40		mA
			110	10		mA
$r_{DS(on)}$	Drain-Source On Resistance	$V_{DS} \leq 0.1\text{V}, V_{GS} = 0$	108		8.0	Ω
			109		12	Ω
			110		18	Ω
Small Signal Characteristics						
$C_{dg(on)}$ $C_{sg(off)}$	Drain Gate & Source Gate On Capacitance	$V_{DS} = 0, V_{GS} = 0, f = 1.0\text{MHz}$			85	pF
$C_{dg(on)}$	Drain-Gate Off Capacitance	$V_{DS} = 0, V_{GS} = -10, f = 1.0\text{MHz}$			15	pF
$C_{sg(off)}$	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	625	350	mW
	Derate above 25°C	5.0	2.8	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 $1.6'' \times 1.6'' \times 0.06''$

Typical Characteristics

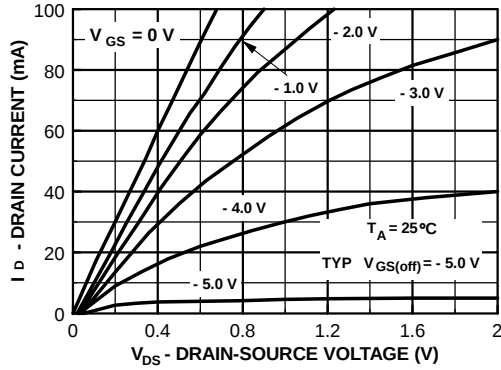


Figure 1. Common Drain-Source

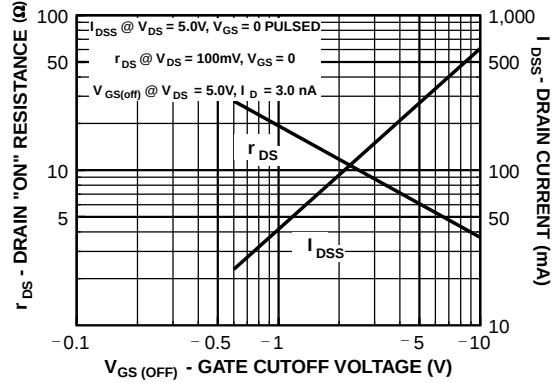


Figure 2. Parameter Interactions

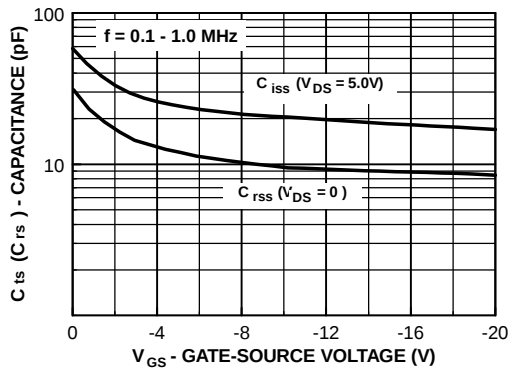


Figure 3. Common Drain-Source

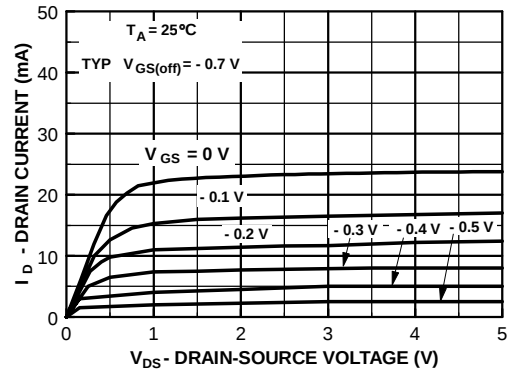


Figure 4. Common Drain-Source

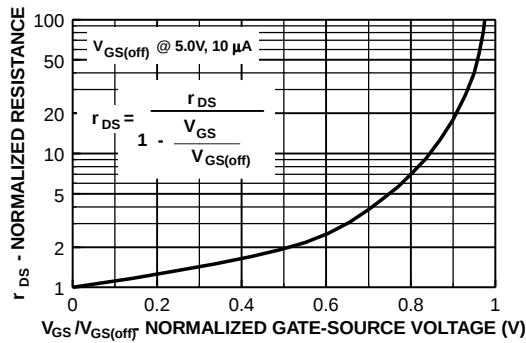


Figure 5. Normalized Drain Resistance vs Bias Voltage

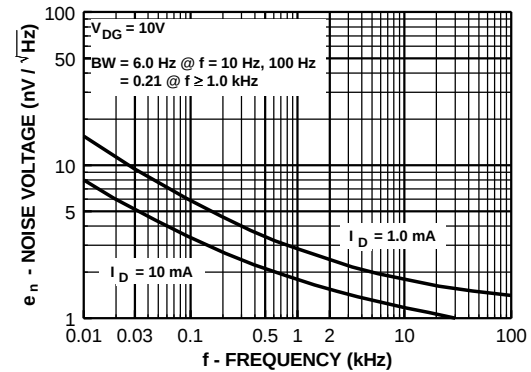


Figure 6. Noise Voltage vs Frequency

Typical Characteristics (Continued)

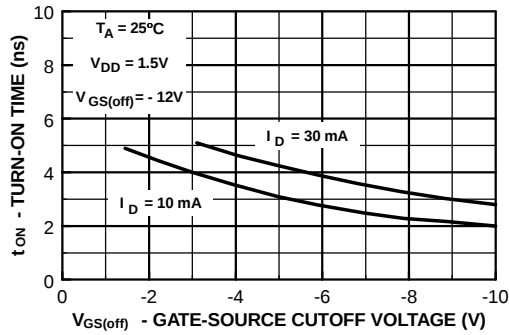


Figure 7. Switching Turn-On Time vs Gate-Source Cutoff Voltage

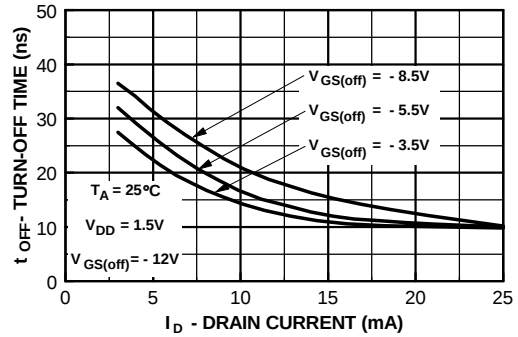


Figure 8. Switching Turn-On Time vs Drain Current

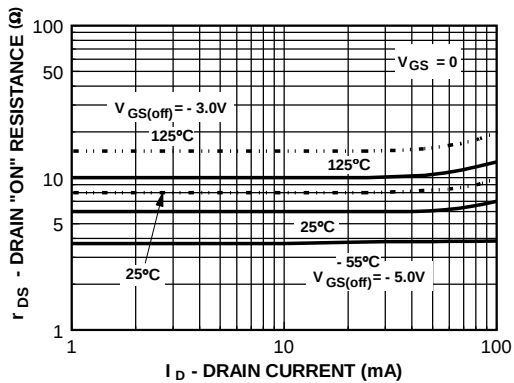


Figure 9. On Resistance vs Drain Current

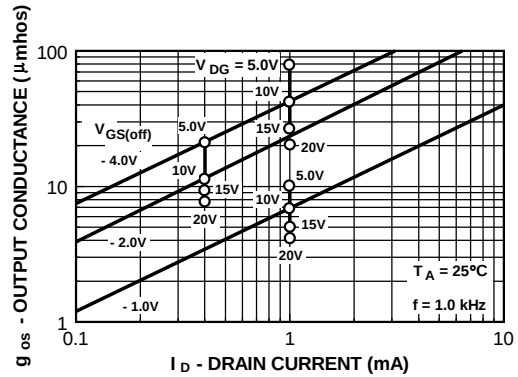


Figure 10. Output Conductance vs Drain Current

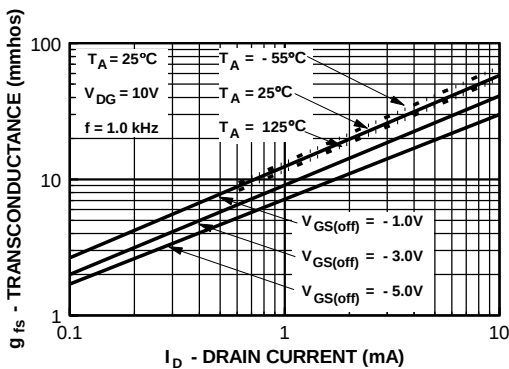


Figure 11. Transconductance vs Drain Current

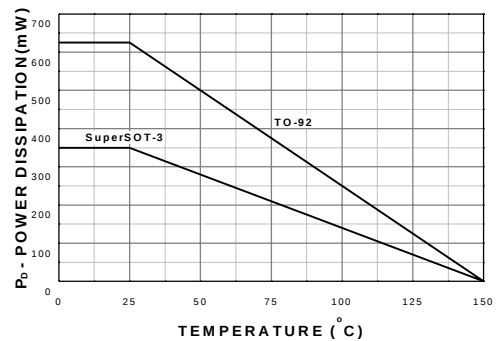
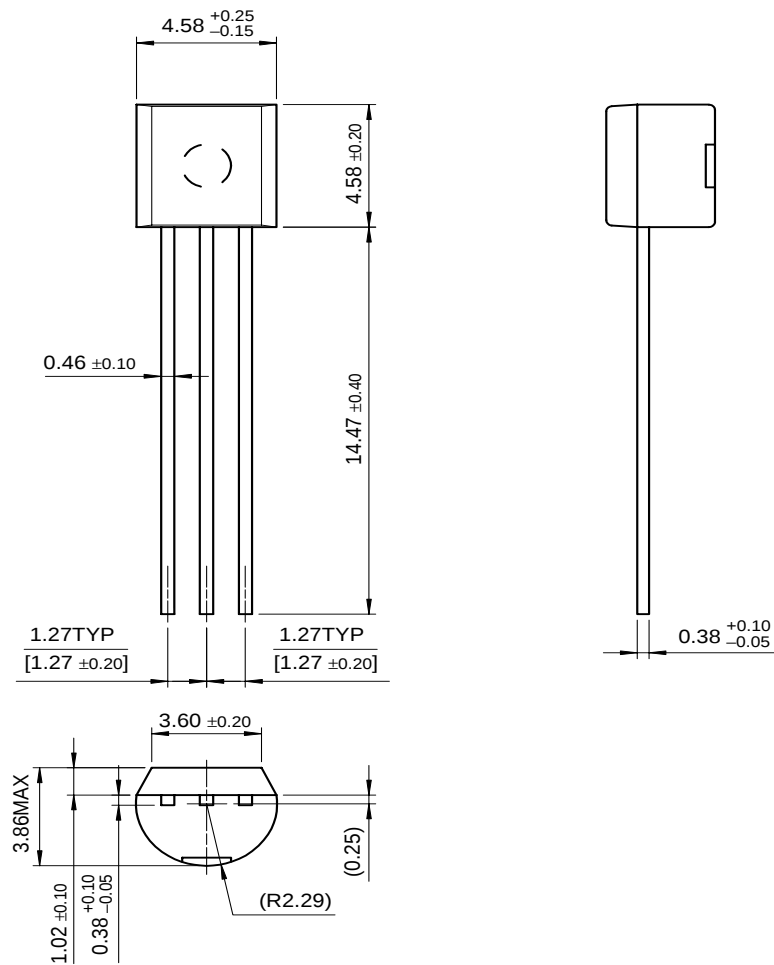


Figure 12. Power Dissipation vs Ambient Temperature

Package Dimensions

TO-92



Dimensions in Millimeters

J108/J109/J110/MMBF-J108

Technical drawing of a shaft assembly showing two views: a front view on the left and a side view on the right.

Front View (Left):

- Left end: $\frac{1}{2}$ inch diameter, 0.0015 [0.038] C.
- First step: 0.0040 [0.10] TYP. and 0.0010 [0.03] TYP.
- Second step: 0.0440 [0.360] and 0.0365 [0.93].
- Third step: 0.0175 ± 0.0025 [0.44 ± 0.06] TYP.

Side View (Right):

- Top: $R0.0030$ [R0.08] MIN. TYP.
- GAGE PLANE: 0.0070 [0.18] TYP. and 0.0040 [0.10] TYP.
- Seating Plane: 0.0080 [0.20] TYP.
- Bottom: 0.0150 ± 0.0020 [0.38 ± 0.05] TYP. and 0.0220 ± 0.0020 [0.56 ± 0.05] TYP.

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VALUES IN [] ARE MILLIMETERS

Rev. B, July 2002

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