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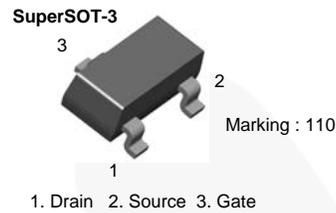


February 2015

# MMBFJ110 N-Channel Switch

## Features

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



## Ordering Information

Part Number	Top Mark	Package	Packing Method
MMBFJ110	110	SSOT 3L	Tape and Reel

## Absolute Maximum Ratings<sup>(1), (2)</sup>

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Value	Unit
$V_{DG}$	Drain-Gate Voltage	25	V
$V_{GS}$	Gate-Source Voltage	-25	V
$I_{GF}$	Forward Gate Current	10	mA
$T_J$	Junction Temperature	150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ\text{C}$

### Notes:

1. These ratings are based on a maximum junction temperature of  $150^\circ\text{C}$ .
2. These are steady-state limits. Fairchild Semiconductor should be consulted on applications involving pulsed or low-duty-cycle operations.

**Thermal Characteristics<sup>(3)</sup>**

Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Value	Unit
$P_D$	Total Device Dissipation	460	mW
	Derate Above $25^\circ\text{C}$	3.68	mW/ $^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	270	$^\circ\text{C}/\text{W}$

**Note:**

3. Device mounted on FR-4 PCB 36mm × 18mm × 1.5mm; mounting pad for the collector lead minimum 6cm<sup>2</sup>.

**Electrical Characteristics**

Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Conditions	Min.	Max.	Unit
<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	$V_{GS} = -15 \text{ V}$ , $V_{DS} = 0$		-3.0	nA
		$V_{GS} = -15 \text{ V}$ , $V_{DS} = 0$ , $T_A = 100^\circ\text{C}$		-200	
$V_{GS(off)}$	Gate-Source Cut-Off Voltage	$V_{DS} = 15 \text{ V}$ , $I_D = 10 \text{ nA}$	-0.5	-4.0	V
<b>On Characteristics</b>					
$I_{DSS}$	Zero-Gate Voltage Drain Current <sup>(4)</sup>	$V_{DS} = 15 \text{ V}$ , $V_{GS} = 0$	10		mA
$r_{DS(on)}$	Drain-Source On Resistance	$V_{DS} \leq 0.1 \text{ V}$ , $V_{GS} = 0$		18	$\Omega$
<b>Small Signal Characteristics</b>					
$C_{dg(on)}$ $C_{sg(on)}$	Drain-Gate & Source-Gate On Capacitance	$V_{DS} = 0$ , $V_{GS} = 0$ , $f = 1.0 \text{ MHz}$		85	pF
$C_{dg(off)}$ $C_{sg(off)}$	Drain-Gate & Source-Gate Off Capacitance	$V_{DS} = 0$ , $V_{GS} = -10 \text{ V}$ , $f = 1.0 \text{ MHz}$		15	pF

**Note:**

4. Pulse test: pulse width  $\leq 300 \mu\text{s}$ , duty cycle  $\leq 2\%$ .

Typical Performance Characteristics

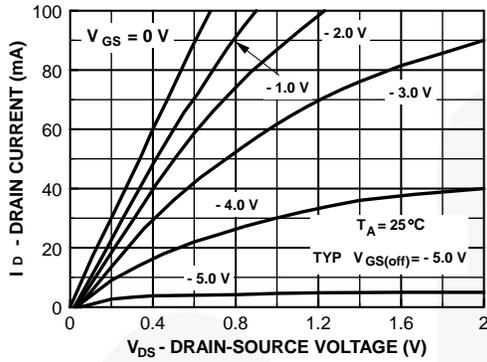


Figure 1. Common Drain-Source

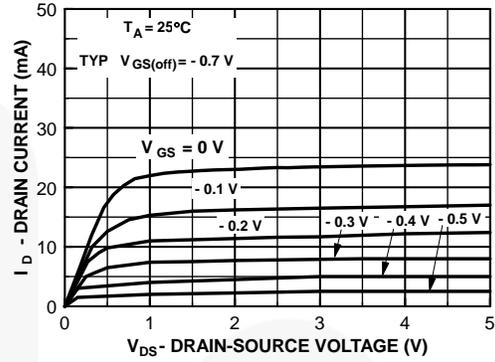


Figure 2. Common Drain-Source

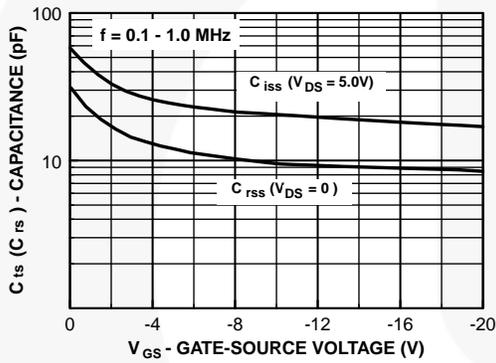


Figure 3. Capacitance vs. Gate-Source Voltage

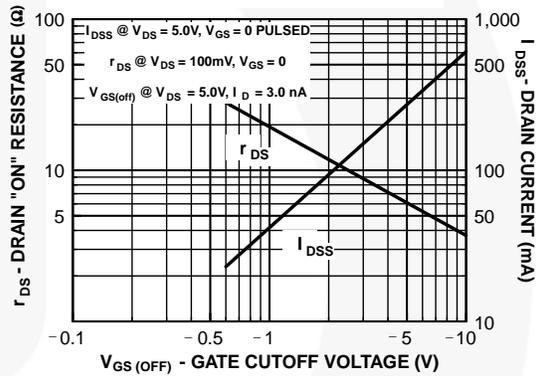


Figure 4. Parameter Interactions

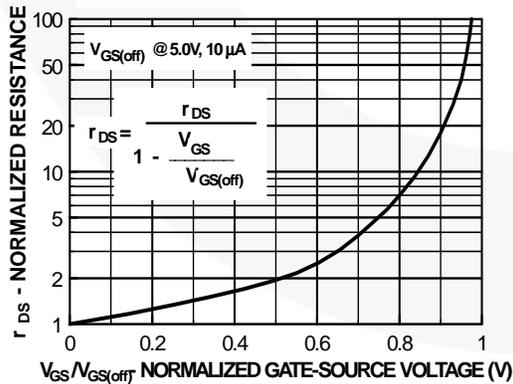


Figure 5. Normalized Drain Resistance vs. Bias Voltage

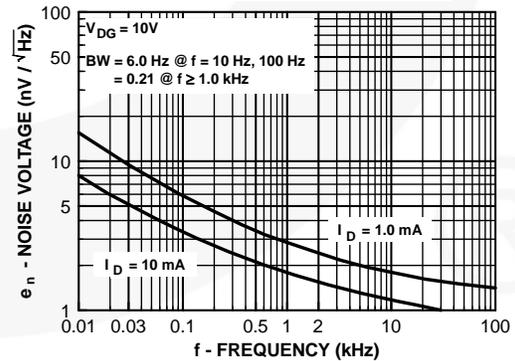


Figure 6. Noise Voltage vs. Frequency

Typical Performance Characteristics (Continued)

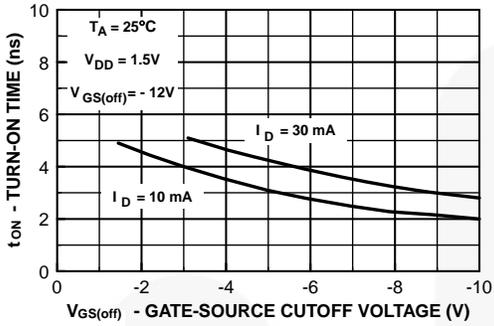


Figure 7. Switching Turn-On Time vs. Gate-Source Cutoff Voltage

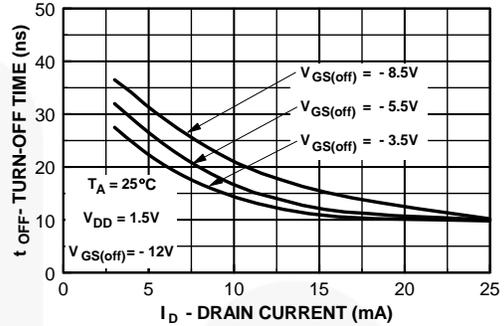


Figure 8. Switching Turn-Off Time vs. Drain Current

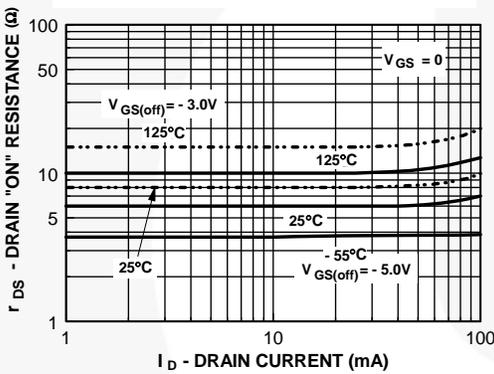


Figure 9. On Resistance vs. Drain Current

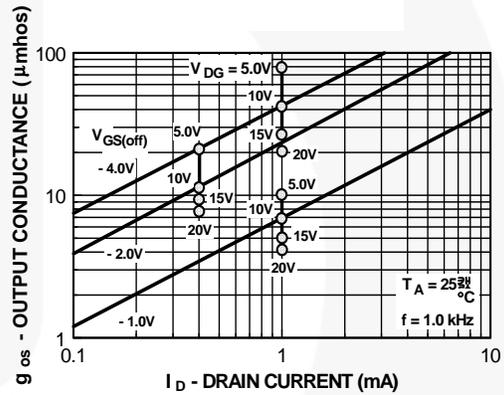


Figure 10. Output Conductance vs. Drain Current

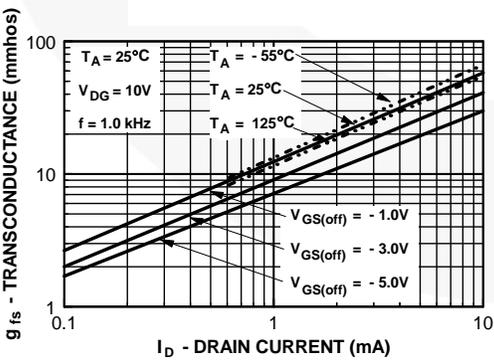


Figure 11. Transconductance vs. Drain Current

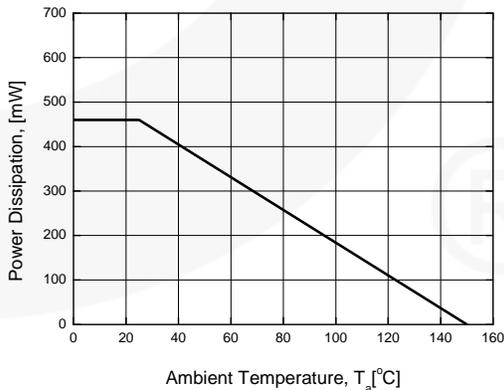
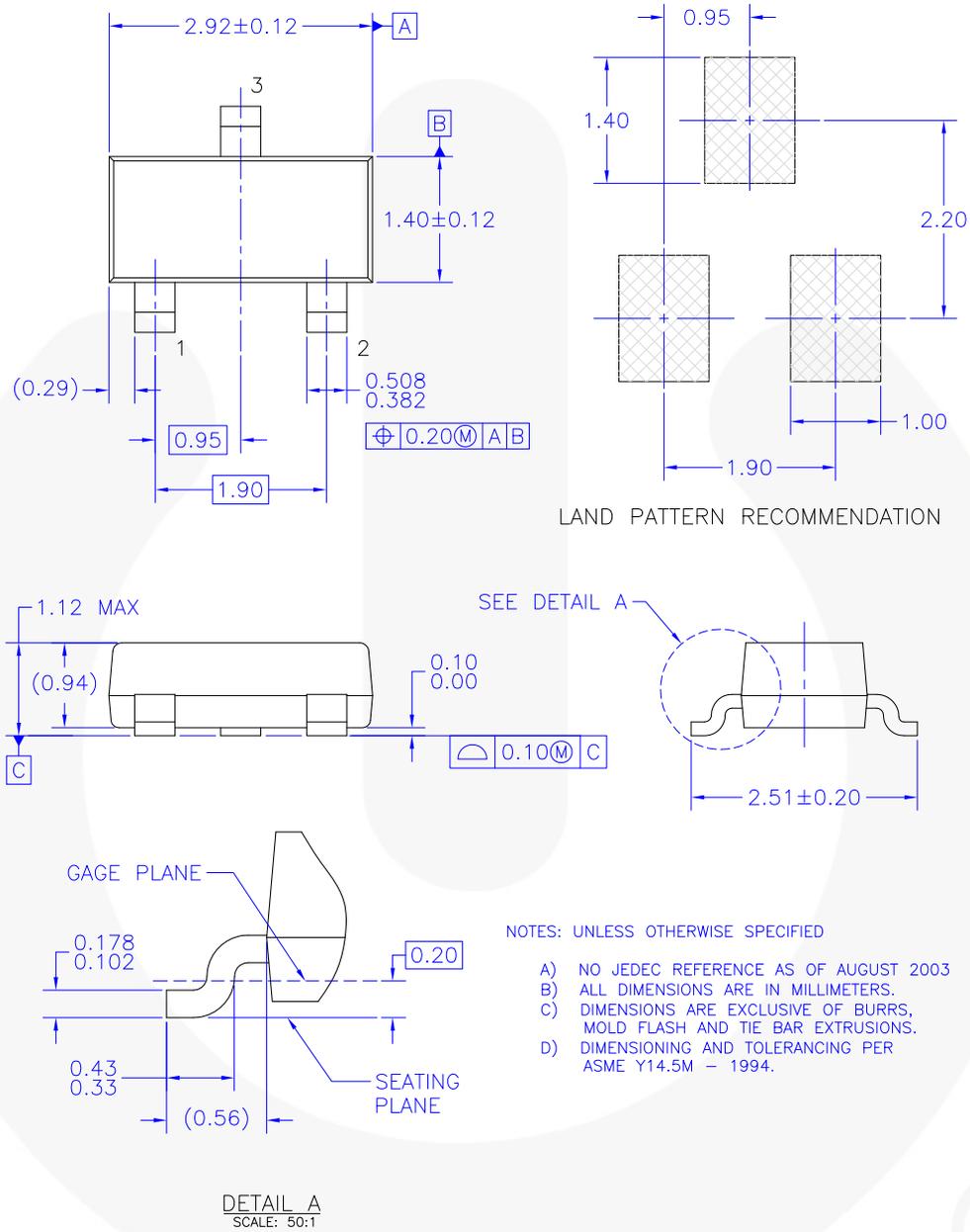


Figure 12. Power Dissipation vs. Ambient Temperature

Physical Dimensions



MA03BREVB

Figure 13. MOLDED PACKAGE, SUPERSOT, 3-LEAD



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