



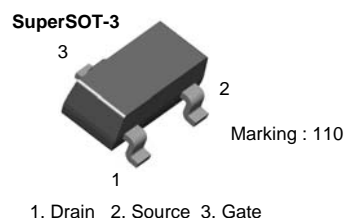
April 2011

# MMBFJ110

## N-Channel Switch

### Features

- 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
$T_J$	Junction Temperature	150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-55 to +150	$^\circ\text{C}$

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

#### NOTES:

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

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

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

\* Device mounted on a minimum pad.

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

Symbol	Parameter	Conditions	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	$V_{GS} = -15\text{V}$ , $V_{DS} = 0$		-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	$V_{DS} = 15\text{V}$ , $I_D = 10\text{nA}$	-0.5	-4.0	V
<b>On Characteristics</b>					
$I_{DSS}$	Zero-Gate Voltage Drain Current*	$V_{DS} = 15\text{V}$ , $I_{GS} = 0$	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>					
$C_{dg(on)}$ $C_{sg(off)}$	Drain-Gate & Source-Gate On Capacitance	$V_{DS} = 0$ , $V_{GS} = 0$ , $f = 1.0\text{MHz}$		85	pF
$C_{dg(off)}$	Drain-Gate Off Capacitance	$V_{DS} = 0$ , $V_{GS} = -10\text{V}$ , $f = 1.0\text{MHz}$		15	pF
$C_{sg(off)}$	Source-Gate Off Capacitance	$V_{DS} = 0$ , $V_{GS} = -10\text{V}$ , $f = 1.0\text{MHz}$		15	pF

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

Typical Performance Characteristics

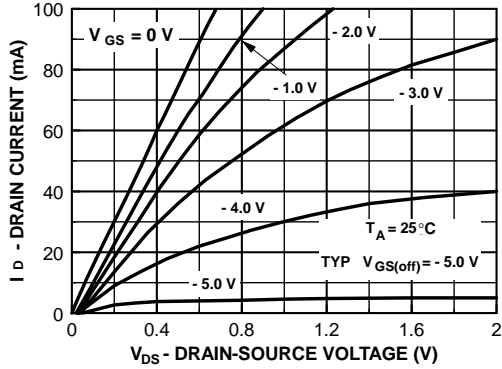


Figure 1. Common Drain-Source

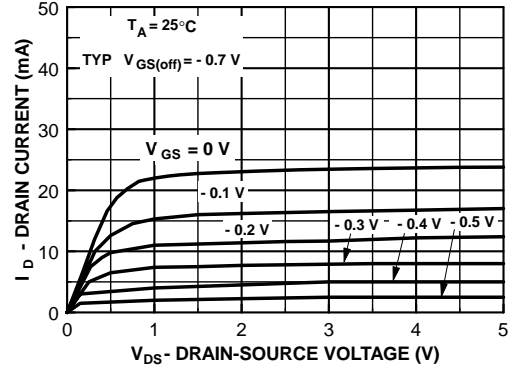


Figure 2. Common Drain-Source

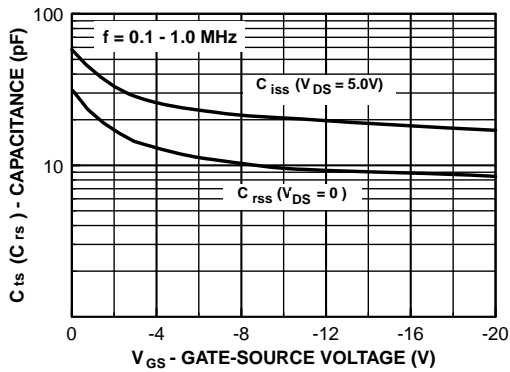


Figure 3. Capacitance vs Gate-Source Voltage

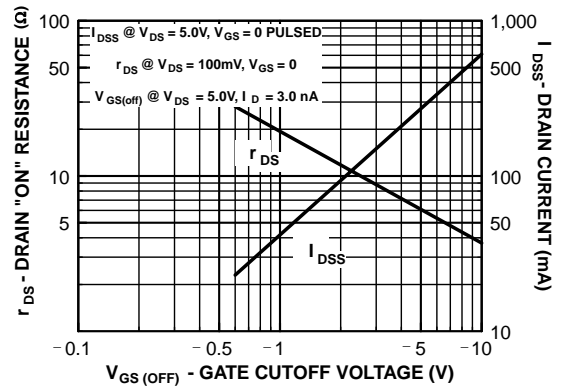


Figure 4. Parameter Interactions

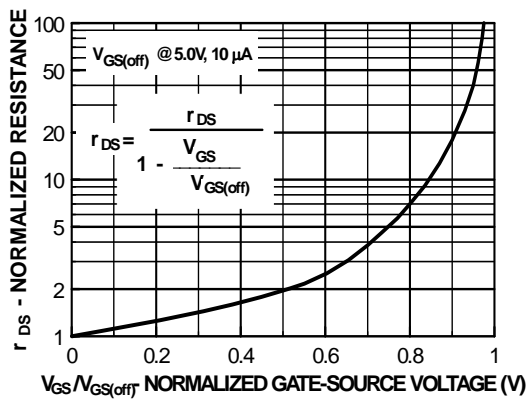


Figure 5. Normalized Drain Resistance vs Bias Voltage

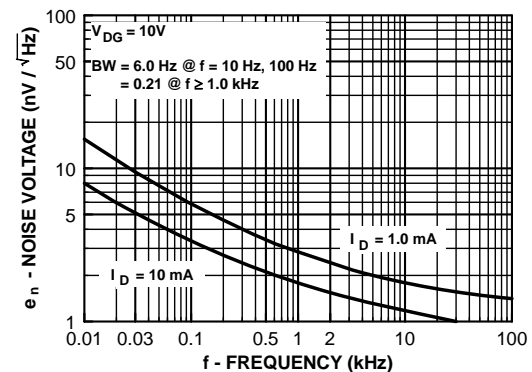


Figure 6. Noise Voltage vs Frequency

Typical Performance Characteristics (Continued)

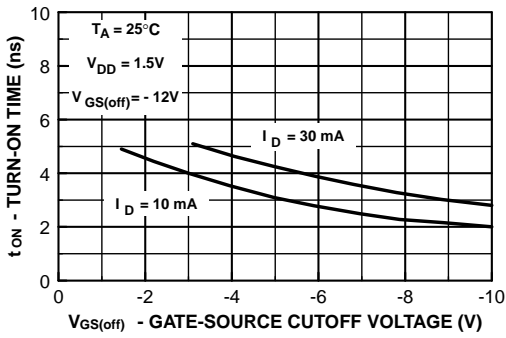


Figure 7. Switching Turn-On Time vs Gate-Source Cutoff Voltage

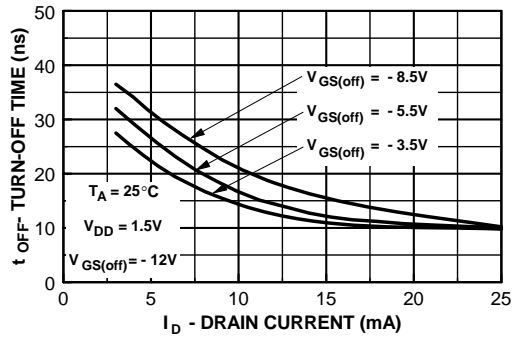


Figure 8. Switching Turn-Off Time vs Drain Current

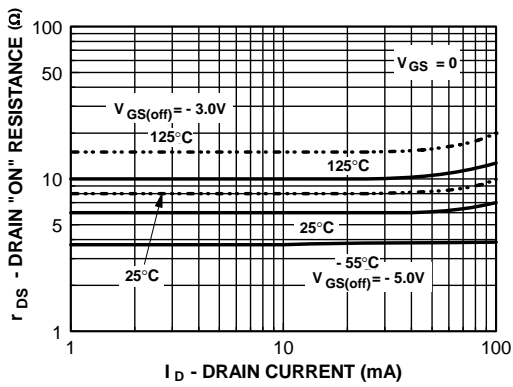


Figure 9. On Resistance vs Drain Current

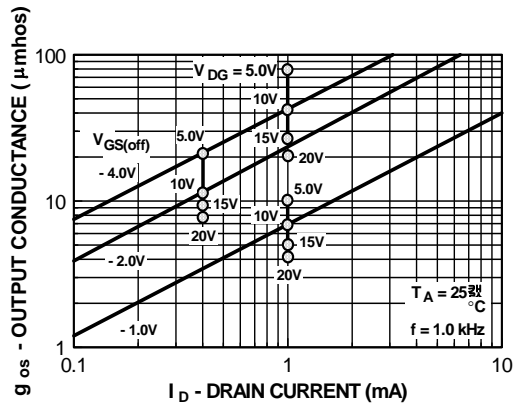


Figure 10. Output Conductance vs Drain Current

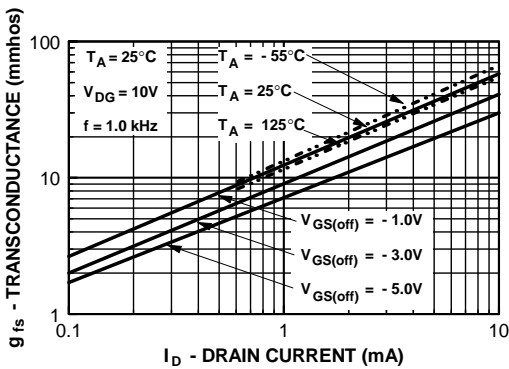


Figure 11. Transconductance vs Drain Current

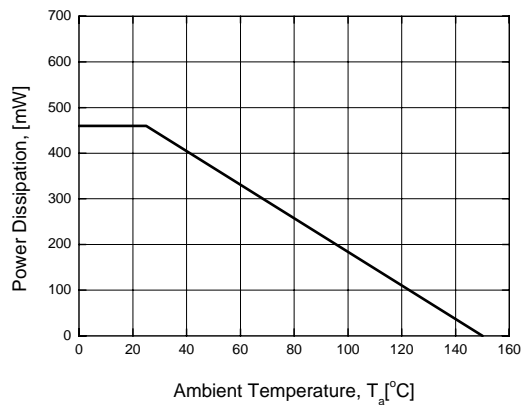
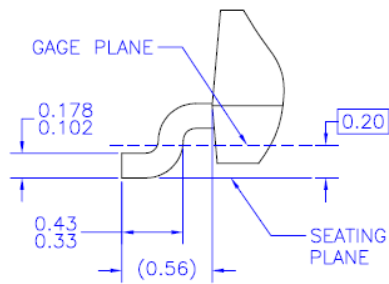
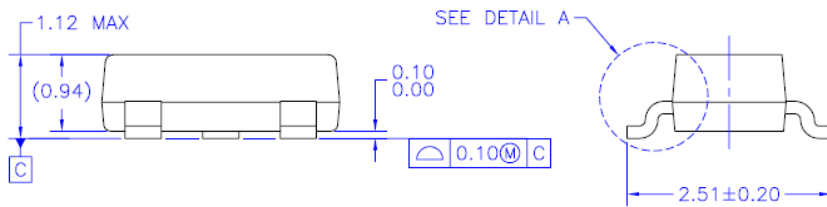
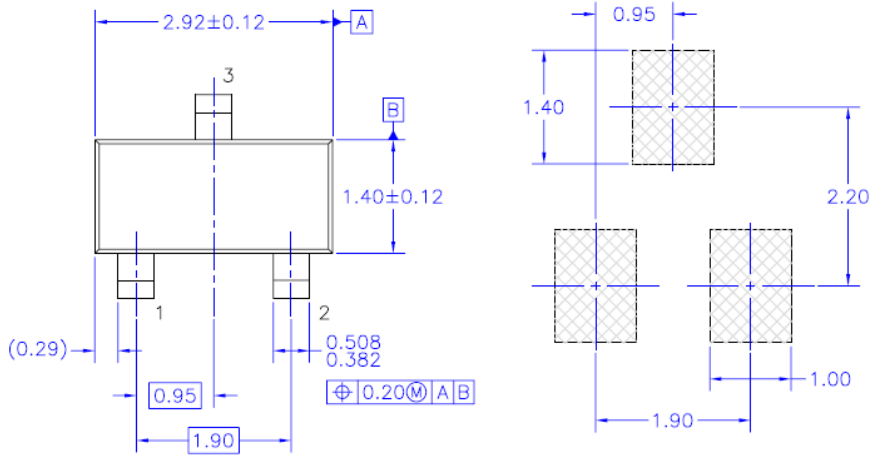


Figure 12. Power Dissipation vs Ambient Temperature

Physical Dimensions

SuperSOT-3



DETAIL A  
SCALE: 50:1

NOTES: UNLESS OTHERWISE SPECIFIED






- A) NO JEDEC REFERENCE AS OF AUGUST 2003
- B) ALL DIMENSIONS ARE IN MILLIMETERS.
- C) DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH AND TIE BAR EXTRUSIONS.
- D) DIMENSIONING AND TOLERANCING PER ASME Y14.5M - 1994.

Dimensions in Millimeters



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|----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
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| Auto-SPM™                                                                                    | FRFET®                                                                                     | PowerTrench®                                                                                       | The Right Technology for Your Success™                                                      |
| AX-CAP™*                                                                                     | Global Power Resource <sup>SM</sup>                                                        | PowerXS™                                                                                           | the <b>power</b> franchise                                                                  |
| Build it Now™                                                                                | Green FPS™                                                                                 | Programmable Active Droop™                                                                         | TinyBoost™                                                                                  |
| CorePLUS™                                                                                    | Green FPS™ e-Series™                                                                       | QFET®                                                                                              | TinyBuck™                                                                                   |
| CorePOWER™                                                                                   | Gmax™                                                                                      | QS™                                                                                                | TinyCalc™                                                                                   |
| CROSSVOLT™                                                                                   | GTO™                                                                                       | Quiet Series™                                                                                      | TinyLogic®                                                                                  |
| CTL™                                                                                         | IntelliMAX™                                                                                | RapidConfigure™                                                                                    | TINYOPTO™                                                                                   |
| Current Transfer Logic™                                                                      | ISOPLANAR™                                                                                 |  ™                | TinyPower™                                                                                  |
| DEUXPEED®                                                                                    | MegaBuck™                                                                                  | Saving our world, 1mW/W/kW at a time™                                                              | TinyPWM™                                                                                    |
| Dual Cool™                                                                                   | MICROCOUPLER™                                                                              | SignalWise™                                                                                        | TinyWire™                                                                                   |
| EcoSPARK®                                                                                    | MicroFET™                                                                                  | SmartMax™                                                                                          | TriFault Detect™                                                                            |
| EfficientMax™                                                                                | MicroPak™                                                                                  | SMART START™                                                                                       | TRUECURRENT®*                                                                               |
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| Fairchild Semiconductor®                                                                     | MotionMax™                                                                                 | SuperFET®                                                                                          | UHC®                                                                                        |
| FACT Quiet Series™                                                                           | Motion-SPM™                                                                                | SuperSOT™-3                                                                                        | Ultra FRFET™                                                                                |
| FACT®                                                                                        | mWSaver™                                                                                   | SuperSOT™-6                                                                                        | UniFET™                                                                                     |
| FAST®                                                                                        | OptoHiT™                                                                                   | SuperSOT™-8                                                                                        | VCX™                                                                                        |
| FastvCore™                                                                                   | OPTOLOGIC®                                                                                 | SupreMOS®                                                                                          | VisualMax™                                                                                  |
| FETBench™                                                                                    | OPTOPLANAR®                                                                                | SyncFET™                                                                                           | XS™                                                                                         |
| FlashWriter®*                                                                                |  PDP SPM™ | Sync-Lock™                                                                                         |                                                                                             |
| FPS™                                                                                         |                                                                                            |  SYSTEM GENERAL®* |                                                                                             |

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