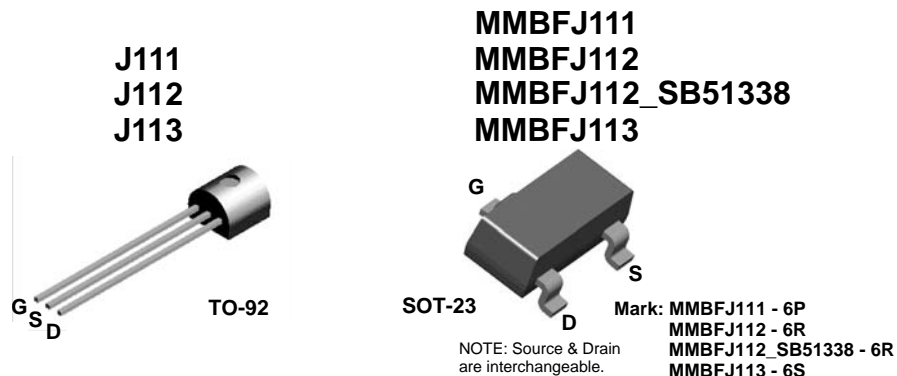


# J111 / J112 / J113 / MMBFJ111 / MMBFJ112 / MMBFJ112\_SB51338 / MMBFJ113 N-Channel Switch

## Features

- This device is designed for low level analog switching, sample and hold circuits and chopper stabilized amplifiers.
- Sourced from Process 51.
- Source & Drain are interchangeable.



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

Symbol	Parameter	Value	Units
$V_{DG}$	Drain-Gate Voltage	35	V
$V_{GS}$	Gate-Source Voltage	-35	V
$I_{GF}$	Forward Gate Current	50	mA
$T_J, T_{stg}$	Operating and Storage Junction 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 degrees 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	Max.		Units
		J111-113	*MMBFJ111-113	
$P_D$	Total Device Dissipation Derate above $25^\circ\text{C}$	625	350	mW
		5.0	2.8	$\text{mW}/^\circ\text{C}$
$R_{\theta JC}$	Thermal Resistance, Junction to Case	125		$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	357	556	$^\circ\text{C}/\text{W}$

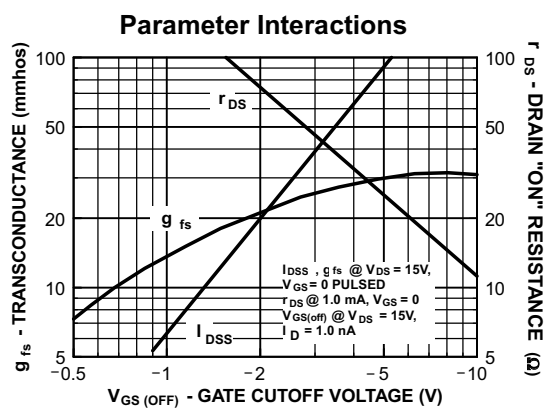
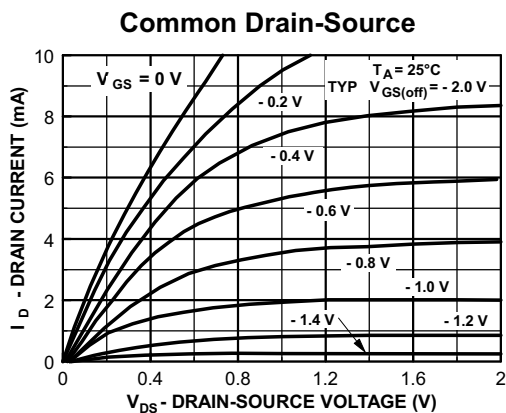
\* Device mounted on FR-4 PCB 1.6" X 1.6" X 0.06".

**Electrical Characteristics**  $T_a = 25^\circ\text{C}$  unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
<b>Off Characteristics</b>						
$BV_{(BR)GSS}$	Gate-Source Breakdown Voltage	$I_G = -1.0\mu\text{A}, V_{DS} = 0$	-35			V
$I_{GSS}$	Gate Reverse Current	$V_{GS} = -15\text{V}, V_{DS} = 0$			-1.0	nA
$V_{GS(off)}$	Gate-Source Cutoff Voltage	$V_{DS} = 5.0\text{V}, I_D = 1.0\mu\text{A}$	111	-3.0	-10	V
			112	-1.0	-5.0	V
			MMBFJ112_SB51338	-3.0	-5.0	V
			113	-0.5	-3.0	V
$I_{D(off)}$	Drain Cutoff Leakage Current	$V_{DS} = 5.0\text{V}, V_{GS} = -10\text{V}$			1.0	nA
<b>On Characteristics</b>						
$I_{DSS}$	Zero-Gate Voltage Drain Current*	$V_{DS} = 15\text{V}, I_{GS} = 0$	111	20		mA
			112	5.0		mA
			113	2.0		mA
$r_{DS(on)}$	Drain-Source On Resistance	$V_{DS} \leq 0.1\text{V}, V_{GS} = 0$	111		30	$\Omega$
			112		50	$\Omega$
			113		100	$\Omega$
<b>Small Signal Characteristics</b>						
$C_{dg(on)}$ $C_{sg(on)}$	Drain Gate & Source Gate On Capacitance	$V_{DS} = 0, V_{GS} = 0, f = 1.0\text{MHz}$			28	pF
$C_{dg(off)}$	Drain-Gate Off Capacitance	$V_{DS} = 0, V_{GS} = -10\text{V}, f = 1.0\text{MHz}$			5.0	pF
$C_{sg(off)}$	Source-Gate Off Capacitance	$V_{DS} = 0, V_{GS} = -10\text{V}, f = 1.0\text{MHz}$			5.0	pF

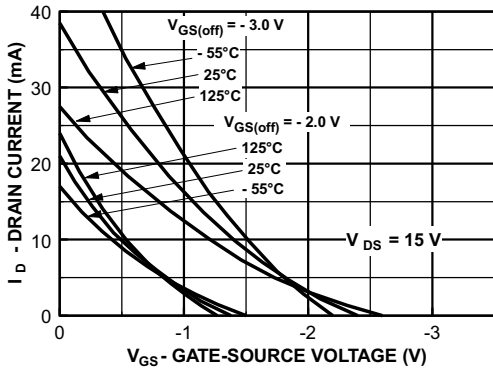
\* Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 3.0\%$

**Typical Performance Characteristics**

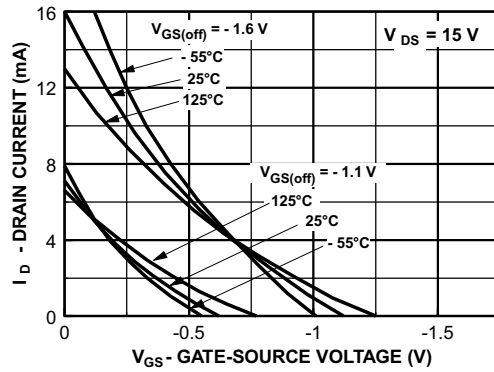


Typical Performance Characteristics (continued)

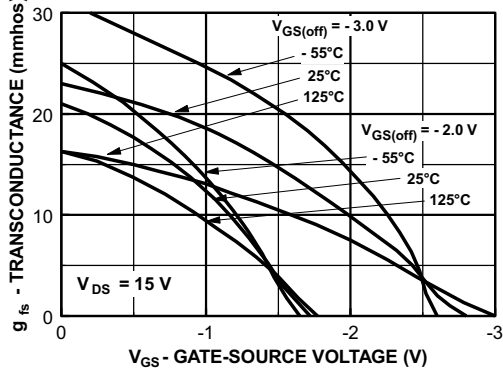
Transfer Characteristics



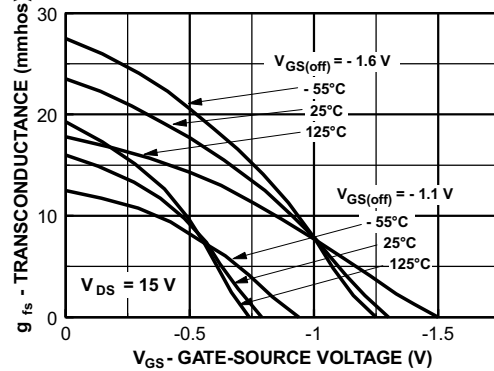
Transfer Characteristics



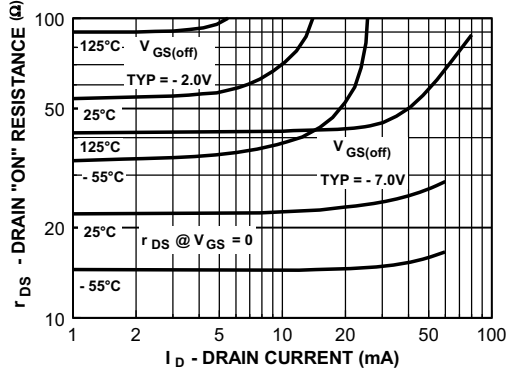
Transfer Characteristics



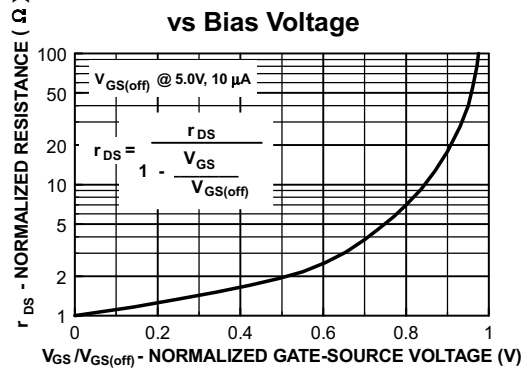
Transfer Characteristics



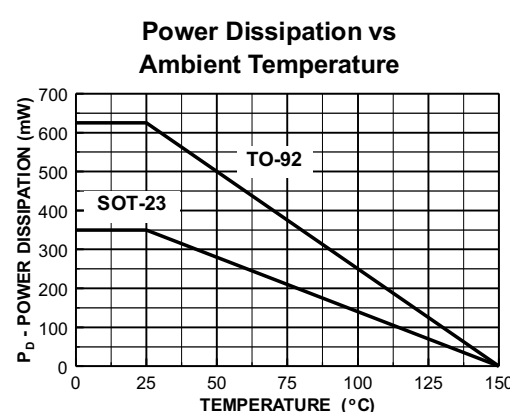
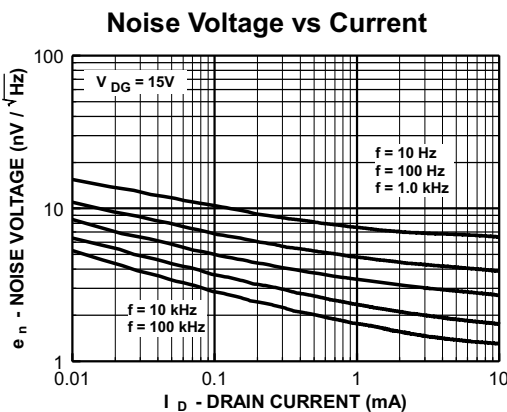
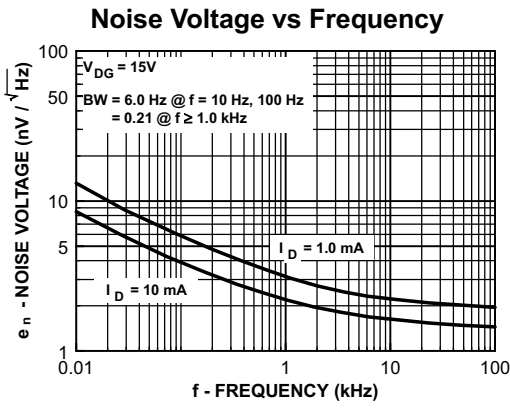
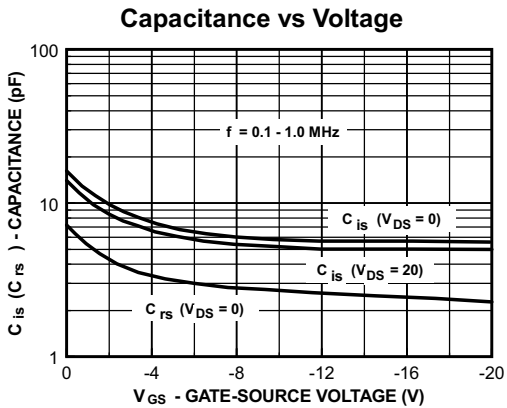
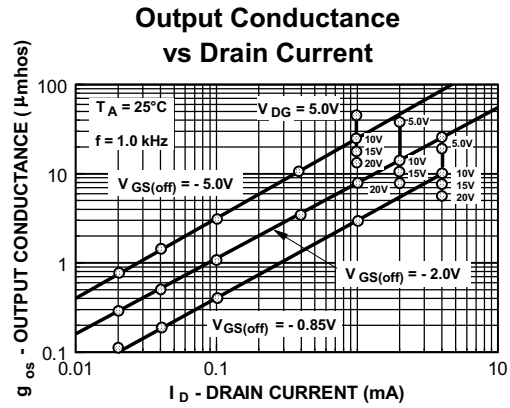
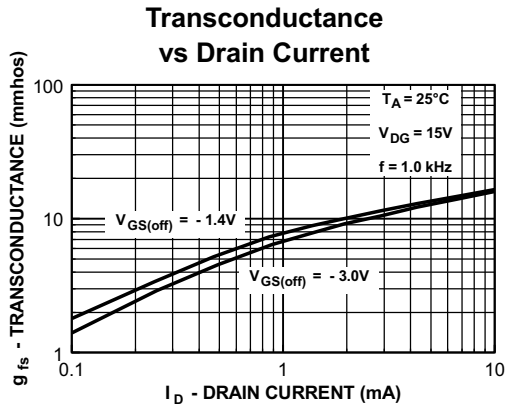
On Resistance vs Drain Current



Normalized Drain Resistance vs Bias Voltage

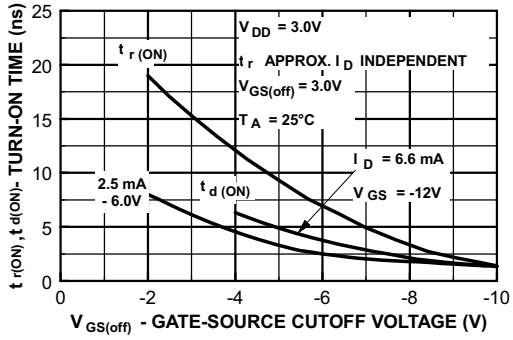


Typical Performance Characteristics (continued)

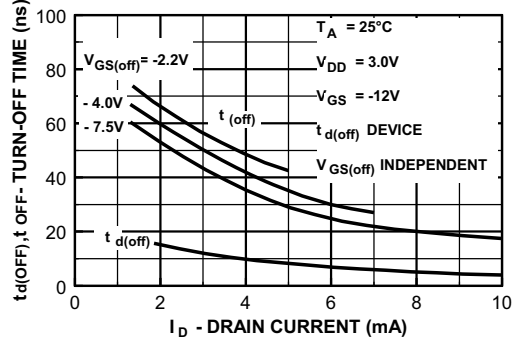


Typical Performance Characteristics (continued)

Switching Turn-On Time vs Gate-Source Voltage







Switching Turn-Off Time vs Drain Current





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Rev. I61