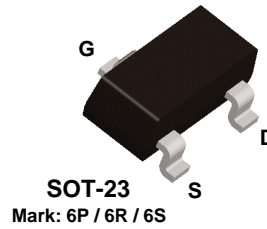
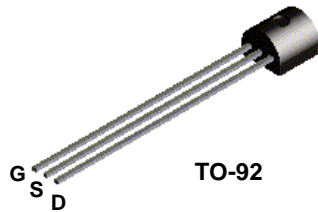


**J111  
J112  
J113**

**MMBFJ111  
MMBFJ112  
MMBFJ113**



## N-Channel Switch

This device is designed for low level analog switching, sample and hold circuits and chopper stabilized amplifiers. Sourced from Process 51.

### Absolute Maximum Ratings\*

TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V <sub>DG</sub>	Drain-Gate Voltage	35	V
V <sub>GS</sub>	Gate-Source Voltage	- 35	V
I <sub>GF</sub>	Forward Gate Current	50	mA
T <sub>J</sub> , T <sub>stg</sub>	Operating and Storage Junction Temperature Range	-55 to +150	°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

TA = 25°C unless otherwise noted

Symbol	Characteristic	Max		Units
		J111- J113	*MMBFJ111	
P <sub>D</sub>	Total Device Dissipation Derate above 25°C	350	225	mW
		2.8	1.8	mW/°C
R <sub>θJC</sub>	Thermal Resistance, Junction to Case	125		°C/W
R <sub>θJA</sub>	Thermal Resistance, Junction to Ambient	357	556	°C/W

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

# N-Channel Switch

(continued)

## Electrical Characteristics

TA = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Max	Units	
<b>OFF CHARACTERISTICS</b>						
$V_{(BR)GSS}$	Gate-Source Breakdown Voltage	$I_G = -1.0 \mu A, V_{DS} = 0$	-35		V	
$I_{GSS}$	Gate Reverse Current	$V_{GS} = -15 V, V_{DS} = 0$		-1.0	nA	
$V_{GS(off)}$	Gate-Source Cutoff Voltage	$V_{DS} = 5.0 V, I_D = 1.0 \mu A$	<b>J111</b>	-3.0	-10	V
			<b>J112</b>	-1.0	-5.0	V
			<b>J113</b>	-0.5	-3.0	V
$I_{D(off)}$	Gate-Source Cutoff Voltage	$V_{DS} = 5.0 V, V_{GS} = -10 V$		1.0	nA	

## ON CHARACTERISTICS

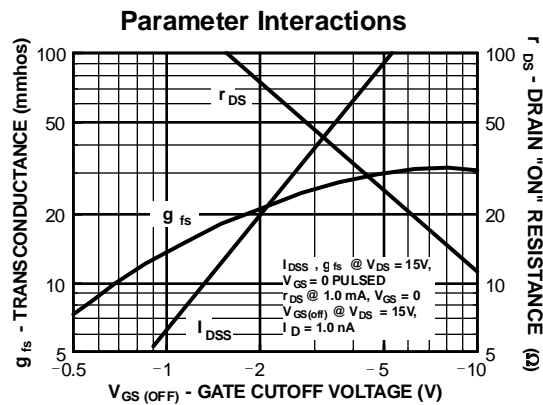
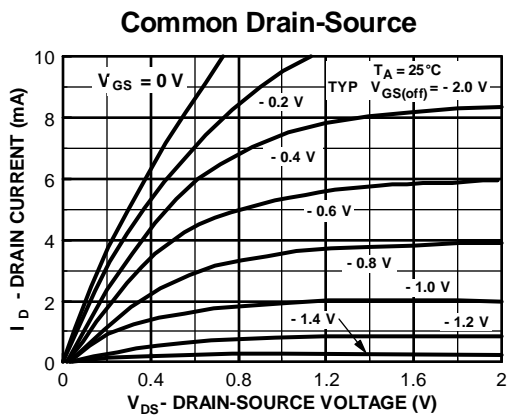
$I_{DSS}$	Zero-Gate Voltage Drain Current*	$V_{DS} = 15 V, I_{GS} = 0$	<b>J111</b>	20		mA
			<b>J112</b>	5.0		mA
			<b>J113</b>	2.0		mA
$r_{DS(on)}$	Drain-Source On Resistance	$V_{DS} \leq 0.1 V, V_{GS} = 0$	<b>J111</b>		30	$\Omega$
			<b>J112</b>		50	$\Omega$
			<b>J113</b>		100	$\Omega$

## SMALL-SIGNAL CHARACTERISTICS

$C_{dg(on)}$	Drain Gate & Source Gate On Capacitance	$V_{DS} = 0, V_{GS} = 0, f = 1.0 \text{ MHz}$		28	pF
$C_{sg(on)}$					
$C_{dg(off)}$	Drain-Gate Off Capacitance	$V_{DS} = 0, V_{GS} = -10 V, f = 1.0 \text{ MHz}$		5.0	pF
$C_{sg(off)}$	Source-Gate Off Capacitance	$V_{DS} = 0, V_{GS} = -10 V, f = 1.0 \text{ MHz}$		5.0	pF

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

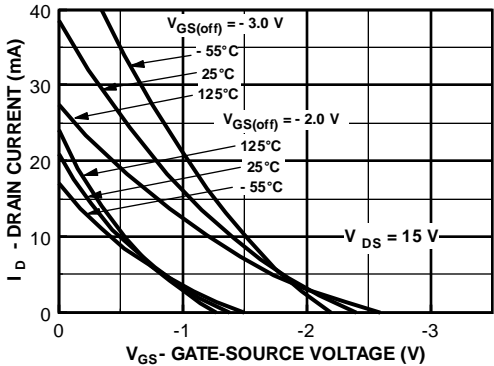
## Typical Characteristics



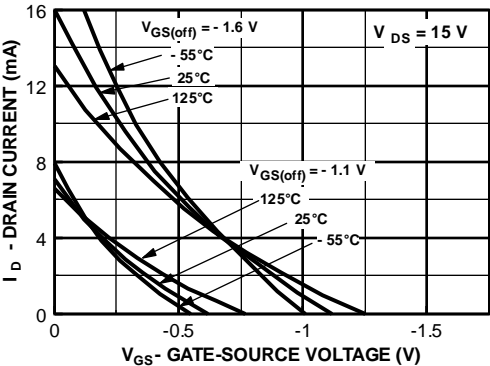
J111 / J112 / J113 / MMBFJ111 / MMBFJ112 / MMBFJ113

Typical Characteristics (continued)

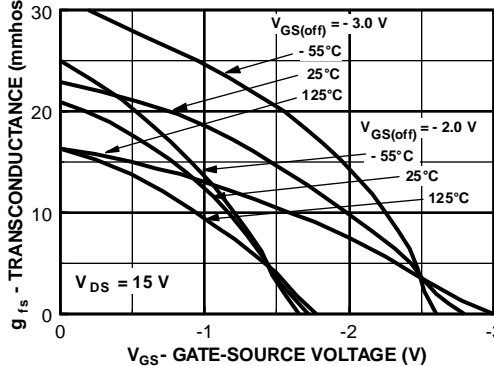
Transfer Characteristics



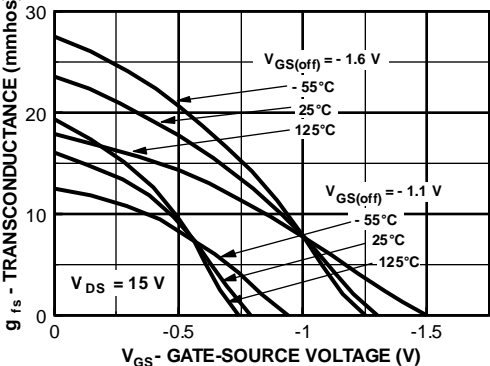
Transfer Characteristics



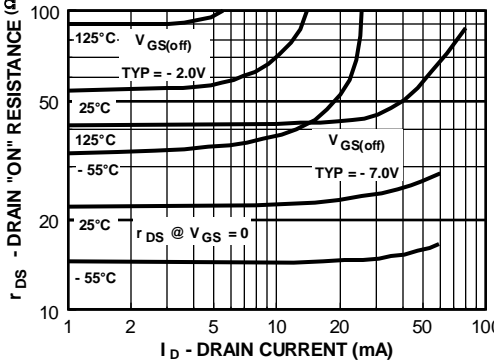
Transfer Characteristics



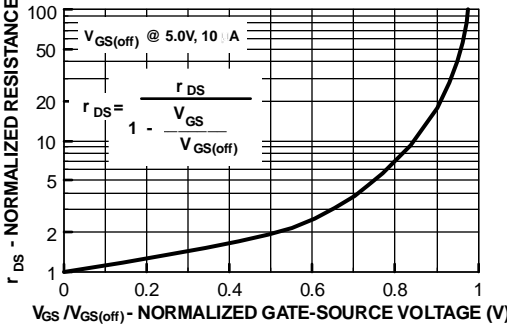
Transfer Characteristics



On Resistance vs Drain Current



Normalized Drain Resistance vs Bias Voltage

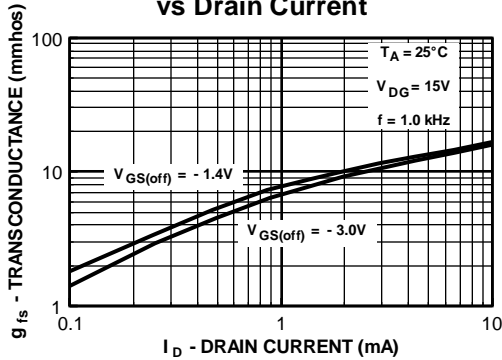


# N-Channel Switch

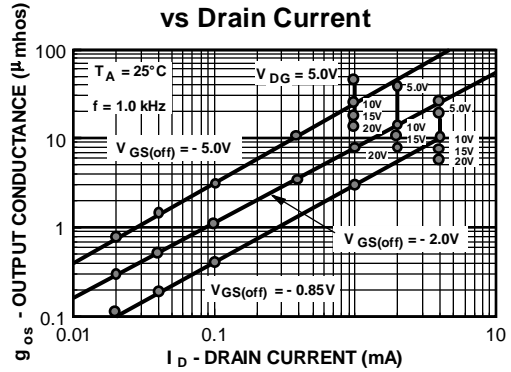
(continued)

## Typical Characteristics (continued)

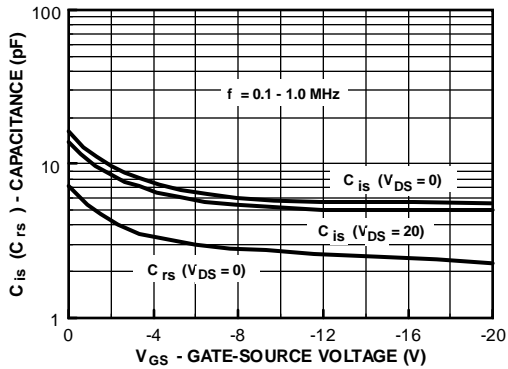
### Transconductance vs Drain Current



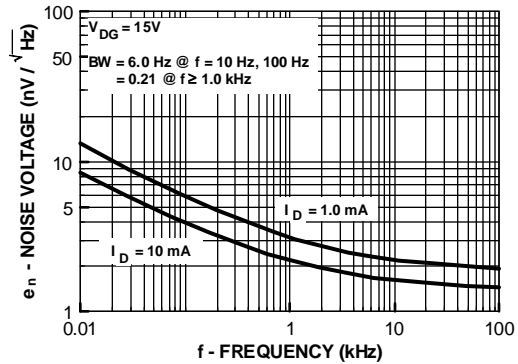
### Output Conductance vs Drain Current



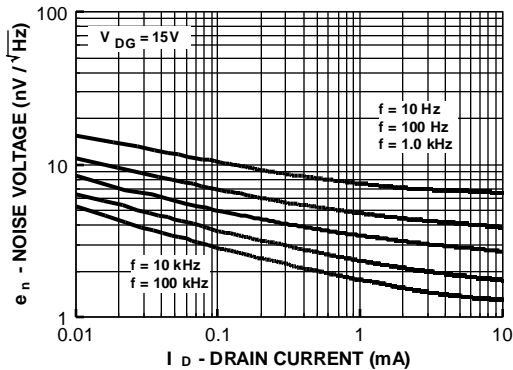
### Capacitance vs Voltage



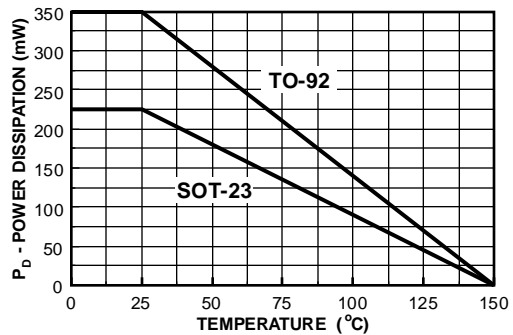
### Noise Voltage vs Frequency



### Noise Voltage vs Current



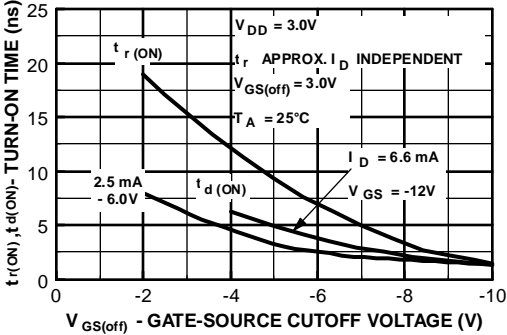
### Power Dissipation vs Ambient Temperature



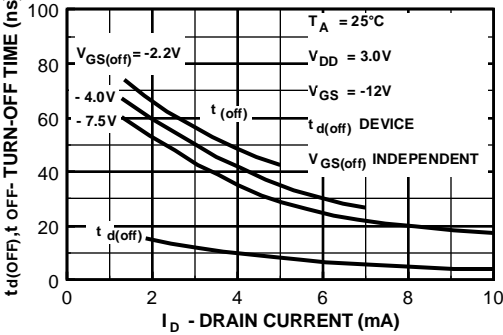
J111 / J112 / J113 / MMBFJ111 / MMBFJ112 / MMBFJ113

Typical Characteristics (continued)

Switching Turn-On Time vs Gate-Source Voltage



Switching Turn-Off Time vs Drain Current



J111 / J112 / J113 / MMBFJ111 / MMBFJ112 / MMBFJ113