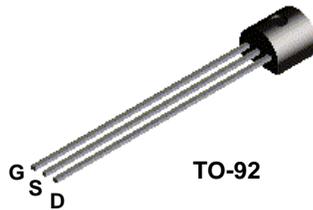




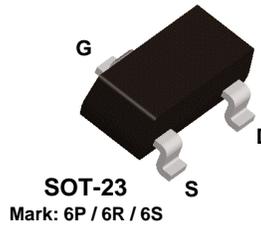
Discrete POWER & Signal
Technologies

J111
J112
J113

MMBFJ111
MMBFJ112
MMBFJ113



TO-92



SOT-23
Mark: 6P / 6R / 6S

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 _{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	°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 _D	Total Device Dissipation Derate above 25°C	350	225	mW
		2.8	1.8	mW/°C
R _{θJC}	Thermal Resistance, Junction to Case	125		°C/W
R _{θJA}	Thermal Resistance, Junction to Ambient	357	556	°C/W

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

J111 / J112 / J113 / MMBFJ111 / MMBFJ112 / MMBFJ113

N-Channel Switch

(continued)

Electrical Characteristics

TA = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Max	Units	
OFF CHARACTERISTICS						
$V_{(BR)GSS}$	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	$V_{DS} = 5.0 V, I_D = 1.0 \mu A$	J111 J112 J113	-3.0 -1.0 -0.5	-10 -5.0 -3.0	V V 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*	$V_{DS} = 15 V, I_{GS} = 0$	J111 J112 J113	20 5.0 2.0		mA mA mA
$r_{DS(on)}$	Drain-Source On Resistance	$V_{DS} \leq 0.1 V, V_{GS} = 0$	J111 J112 J113		30 50 100	Ω Ω Ω

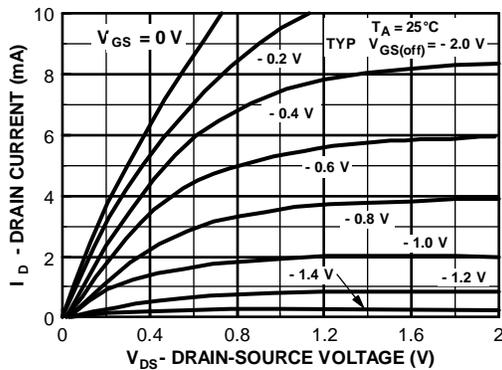
SMALL-SIGNAL CHARACTERISTICS

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

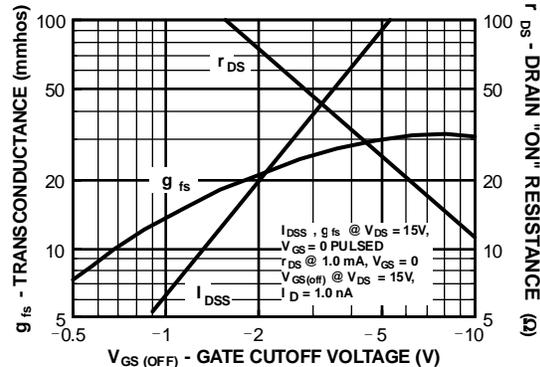
*Pulse Test: Pulse Width $\leq 300 \mu s$, Duty Cycle $\leq 3.0\%$

Typical Characteristics

Common Drain-Source



Parameter Interactions

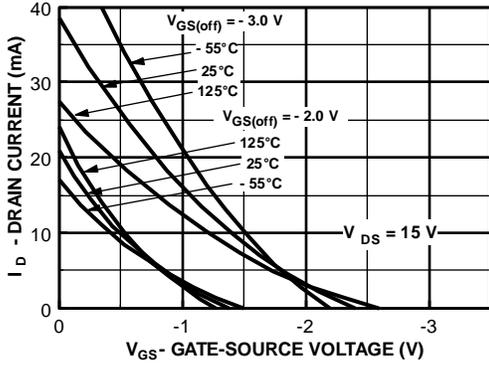


N-Channel Switch

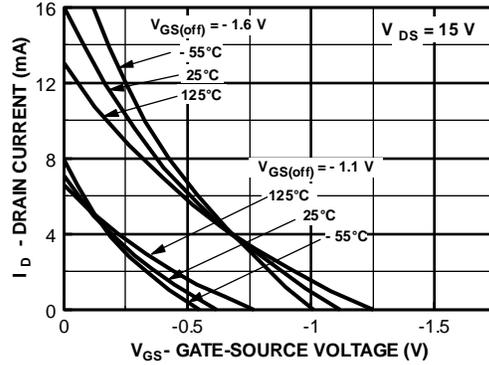
(continued)

Typical Characteristics (continued)

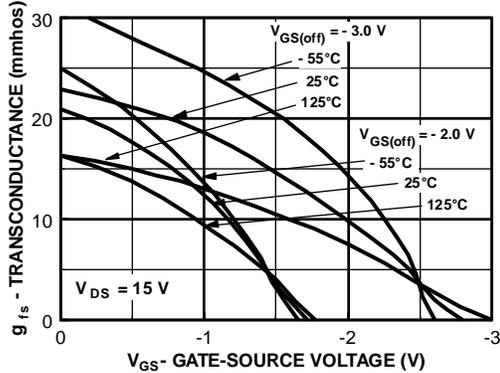
Transfer Characteristics



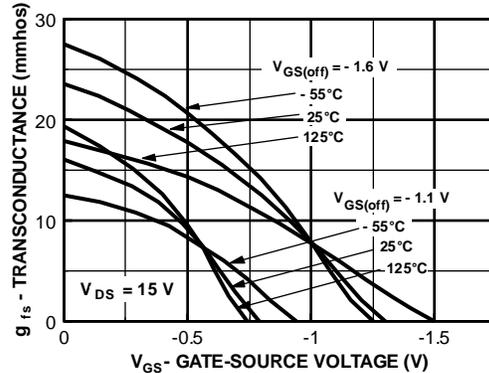
Transfer Characteristics



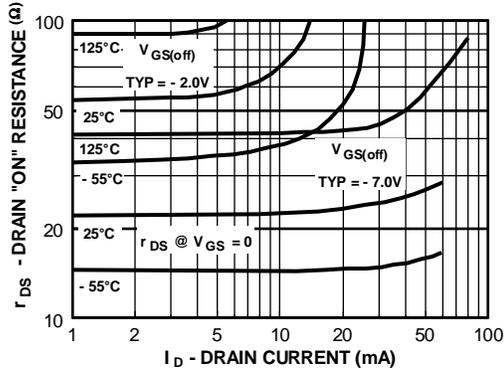
Transfer Characteristics



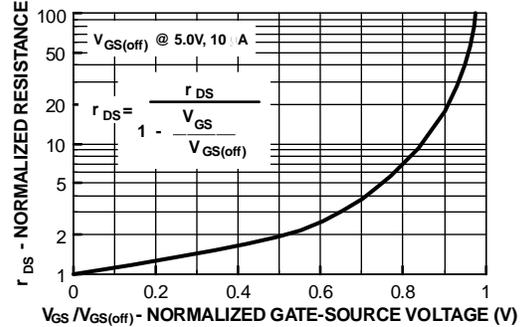
Transfer Characteristics



On Resistance vs Drain Current



Normalized Drain Resistance vs Bias Voltage

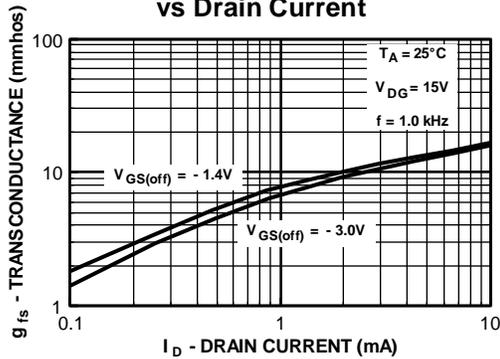


N-Channel Switch

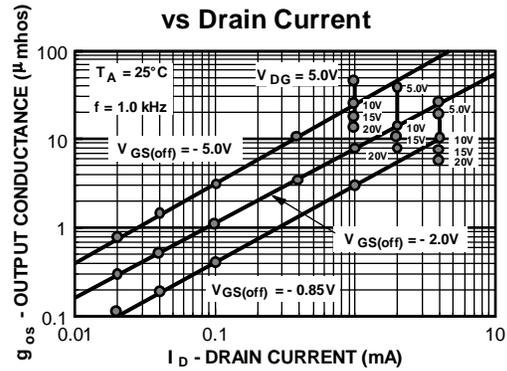
(continued)

Typical Characteristics (continued)

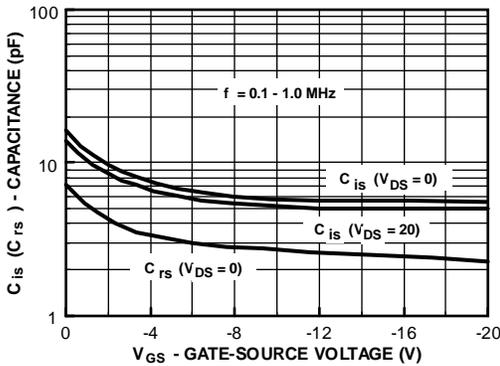
Transconductance vs Drain Current



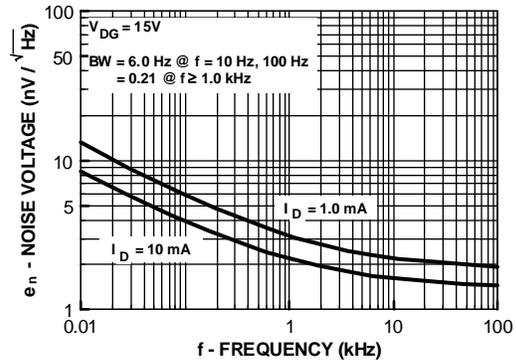
Output Conductance vs Drain Current



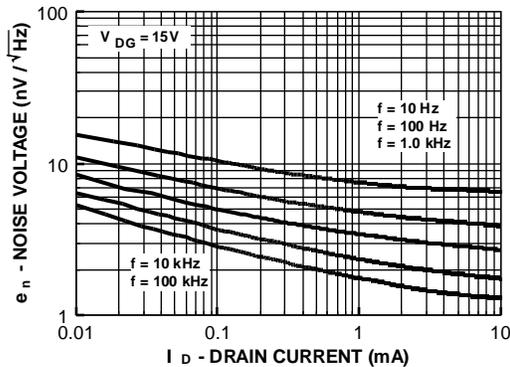
Capacitance vs Voltage



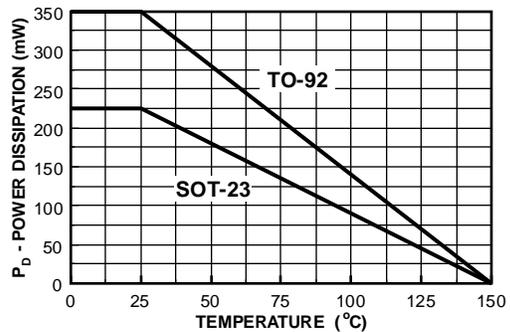
Noise Voltage vs Frequency



Noise Voltage vs Current



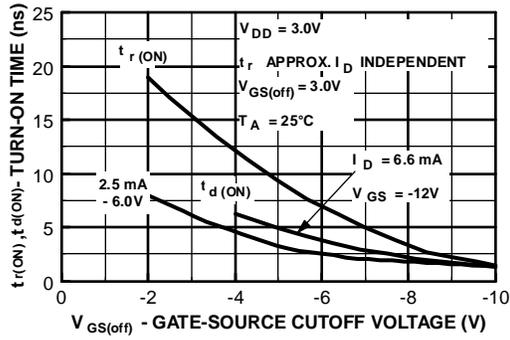
Power Dissipation vs Ambient Temperature



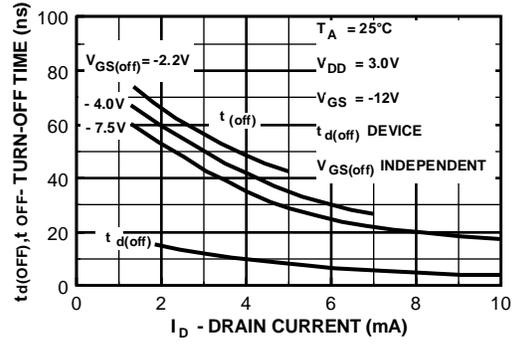
N-Channel Switch
(continued)

Typical Characteristics (continued)

Switching Turn-On Time vs Gate-Source Voltage



Switching Turn-Off Time vs Drain Current



J111 / J112 / J113 / MMBFJ111 / MMBFJ112 / MMBFJ113