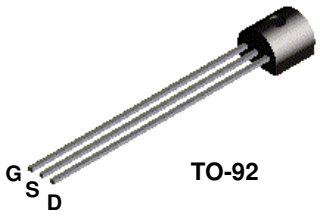
FAIRCHILD SEMICONDUCTOR™

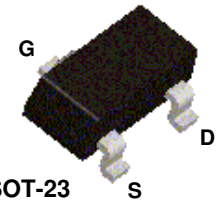
Discrete POWER & Signal Technologies

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 2.8	225 1.8	mW mW/°C
$R_{\theta JC}$	Thermal Resistance, Junction to Case	125		°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	357	556	°C/W

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

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N-Channel Switch
(continued)

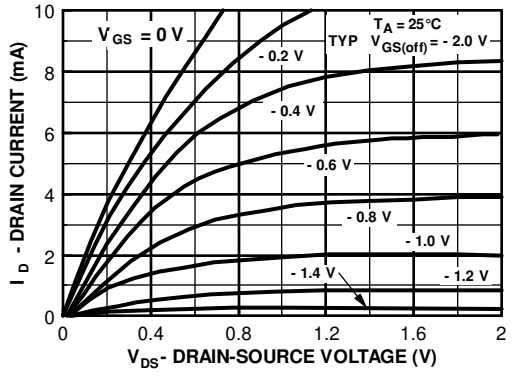
Electrical Characteristics
TA = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions		Min	Max	Units
OFF CHARACTERISTICS						
$V_{(BR)GSS}$	Gate-Source Breakdown Voltage	I_G = - 1.0 μA, 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 μA	**J111**	- 3.0	- 10	V
			J112	- 1.0	- 5.0	V
			J113	- 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	**J111**	20		mA
			J112	5.0		mA
			J113	2.0		mA
$r_{DS(on)}$	Drain-Source On Resistance	V_{DS} ≤ 0.1 V, V_{GS} = 0	**J111**		30	Ω
			J112		50	Ω
			J113		100	Ω
SMALL-SIGNAL CHARACTERISTICS						
$C_{dg(on)}$ $C_{sg(on)}$	Drain Gate & Source Gate On Capacitance	V_{DS} = 0, V_{GS} = 0, f = 1.0 MHz			28	pF
$C_{dg(off)}$	Drain-Gate Off Capacitance	V_{DS} = 0, V_{GS} = - 10 V, f = 1.0 MHz			5.0	pF
$C_{sg(off)}$	Source-Gate Off Capacitance	V_{DS} = 0, V_{GS} = - 10 V, f = 1.0 MHz			5.0	pF

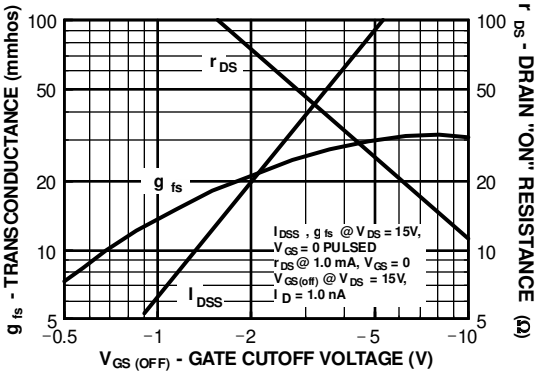
*Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 3.0%

Typical Characteristics

Common Drain-Source

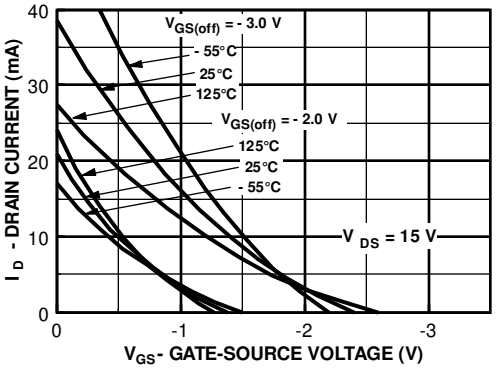


Parameter Interactions

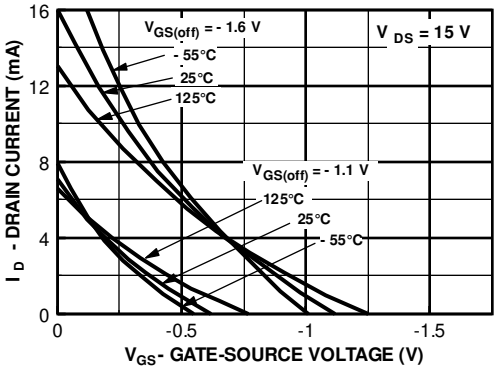


Typical Characteristics (continued)

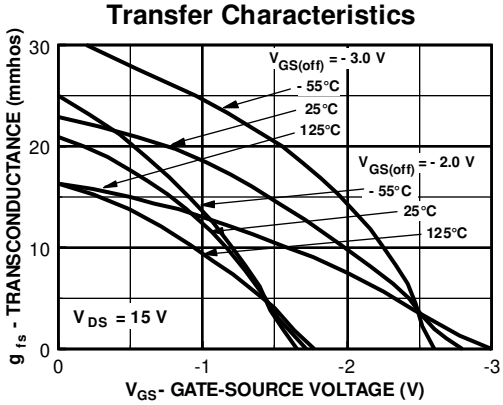
Transfer Characteristics



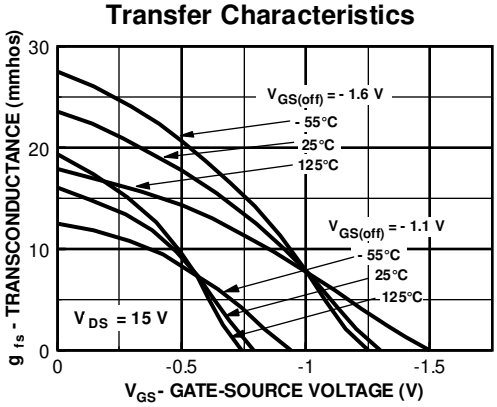
Transfer Characteristics



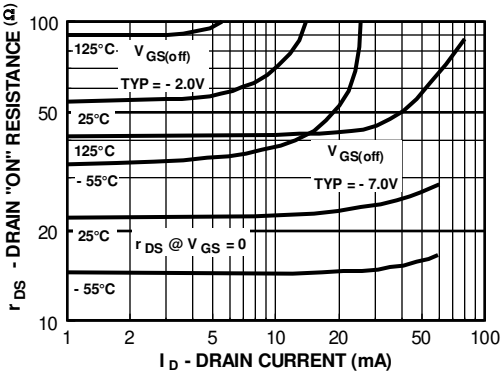
Transfer Characteristics



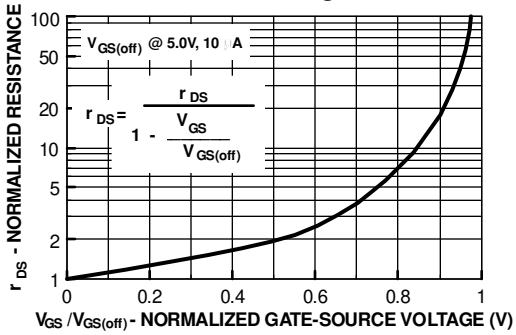
Transfer Characteristics



On Resistance vs Drain Current

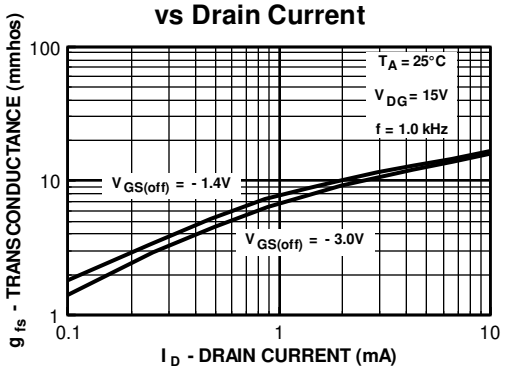


Normalized Drain Resistance vs Bias Voltage

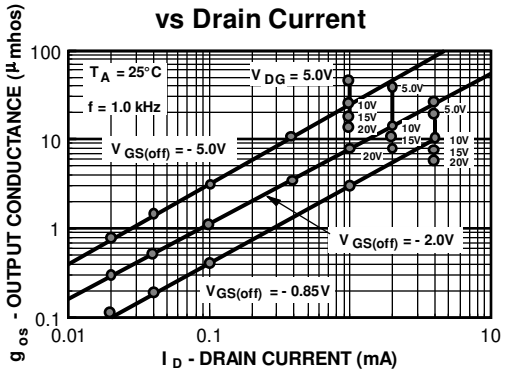


Typical Characteristics (continued)

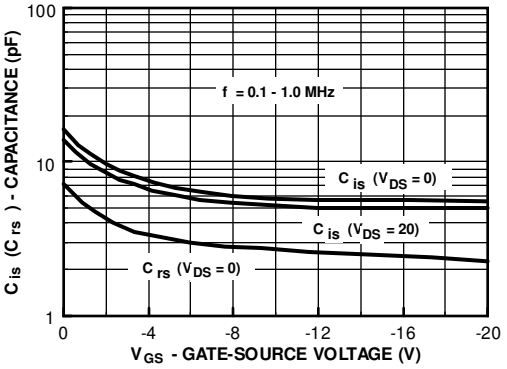
Transconductance vs Drain Current



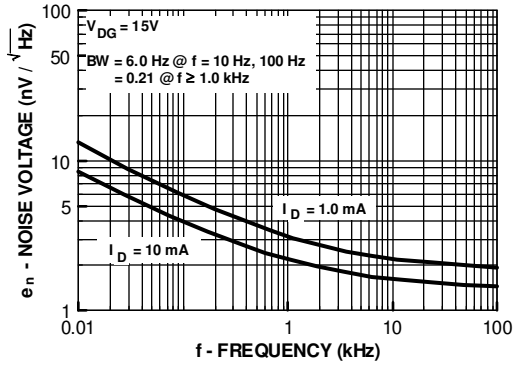
Output Conductance vs Drain Current



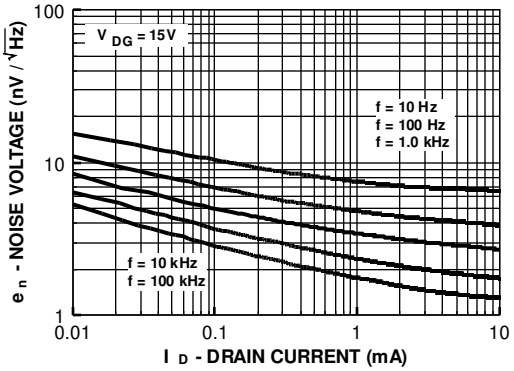
Capacitance vs Voltage



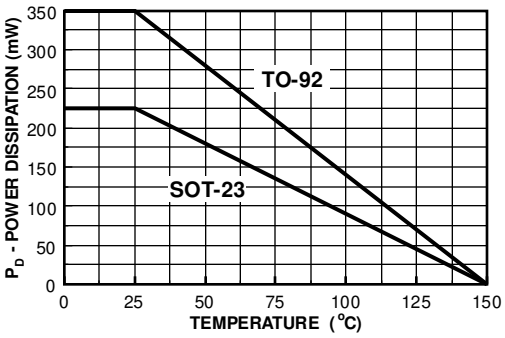
Noise Voltage vs Frequency



Noise Voltage vs Current

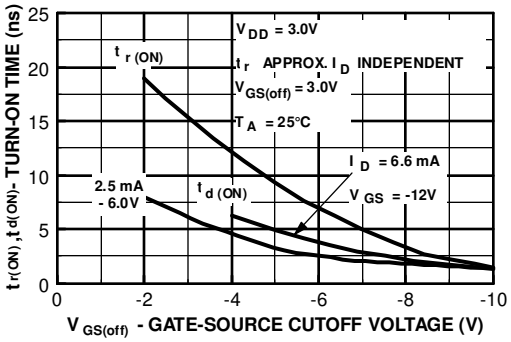


Power Dissipation vs Ambient Temperature



Typical Characteristics (continued)

Switching Turn-On Time vs Gate-Source Voltage



Switching Turn-Off Time vs Drain Current