FAIRCHILD SEMICONDUCTOR®

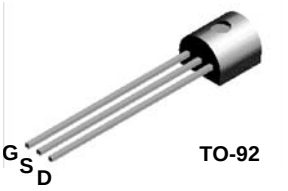
August 2012

J111 / J112 / J113 / MMBFJ111 / MMBFJ112 / MMBFJ112_SB51338 / MMBFJ113
N-Channel Switch

Features

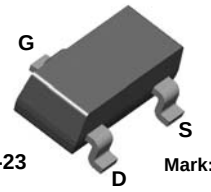
- This device is designed for low level analog switching, sample and hold circuits and chopper stabilized amplifiers.
- Sourced from Process 51.
- Source & Drain are interchangeable.

J111
J112
J113



TO-92

MMBFJ111
MMBFJ112
MMBFJ112_SB51338
MMBFJ113



SOT-23

NOTE: Source & Drain are interchangeable.

Mark: MMBFJ111 - 6P
MMBFJ112 - 6R
MMBFJ112_SB51338 - 6R
MMBFJ113 - 6S

Absolute Maximum Ratings* T_a = 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 T_a = 25°C unless otherwise noted

Symbol	Parameter	Max.		Units
		J111-113	*MMBFJ111-113	
P_D	Total Device Dissipation Derate above 25°C	625 5.0	350 2.8	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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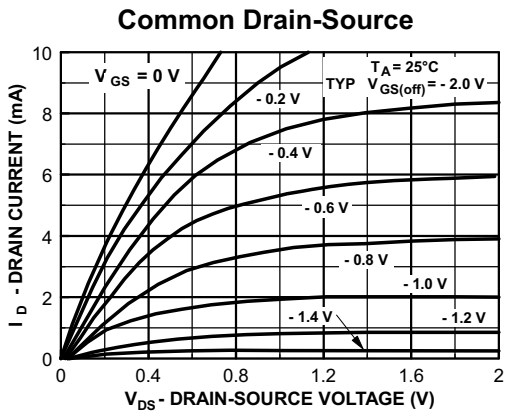
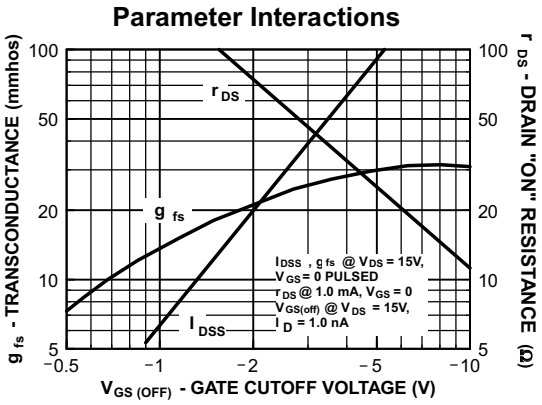
Electrical Characteristics T_a = 25°C unless otherwise noted

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

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

Typical Performance Characteristics





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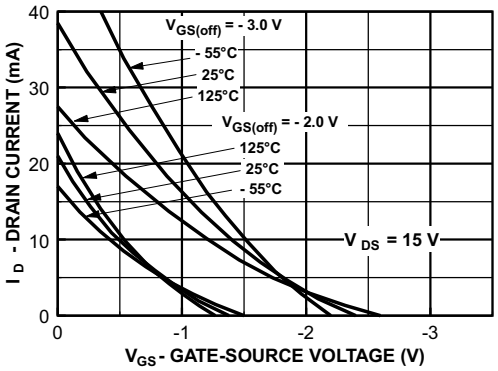
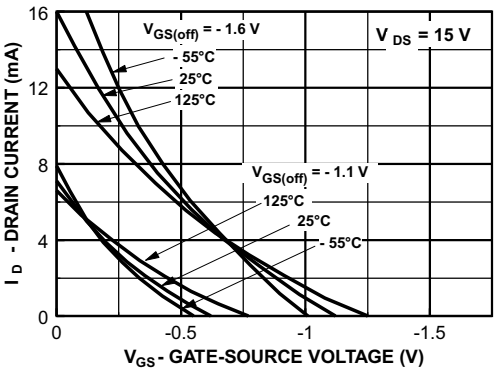
Typical Performance Characteristics (continued)

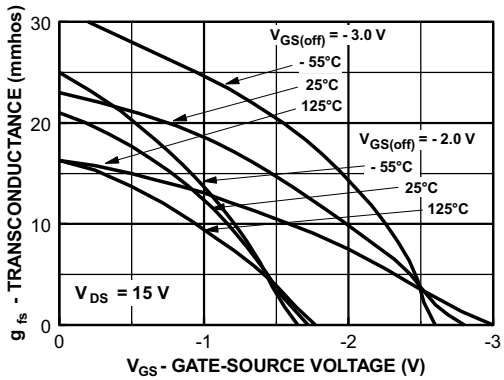
Transfer Characteristics



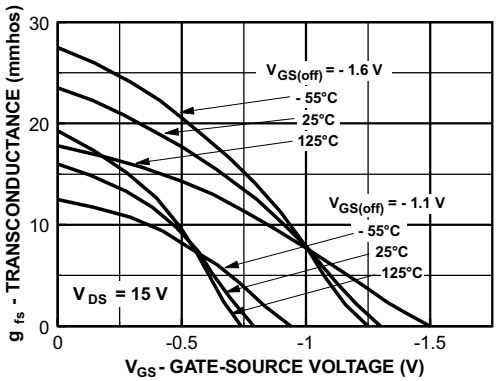
Transfer Characteristics



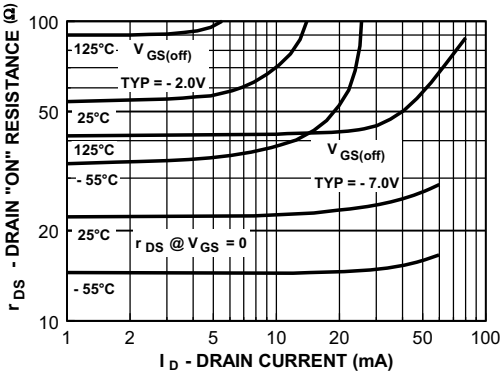
Transfer Characteristics



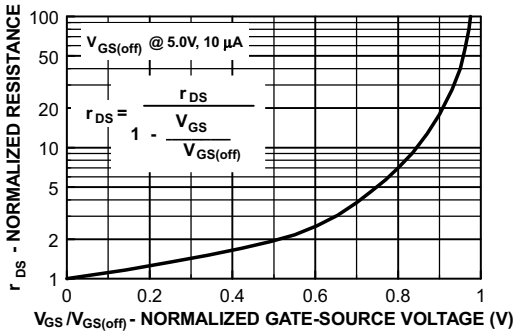
Transfer Characteristics



On Resistance vs Drain Current



Normalized Drain Resistance vs Bias Voltage



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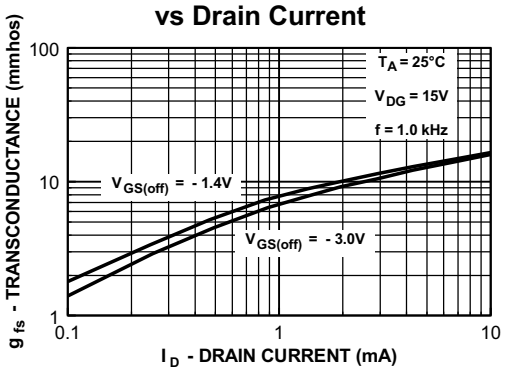
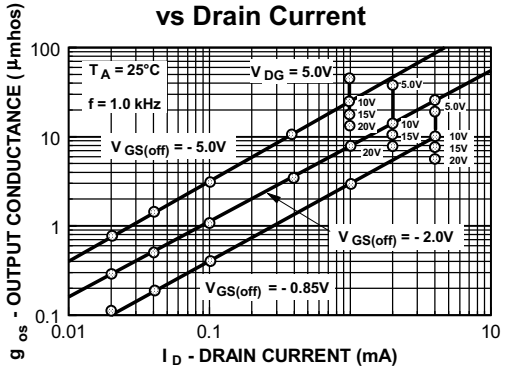
Typical Performance Characteristics (continued)

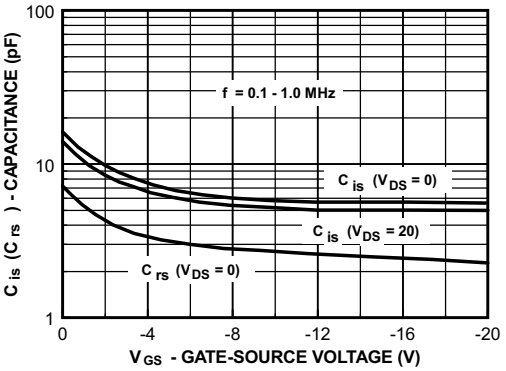
Transconductance vs Drain Current



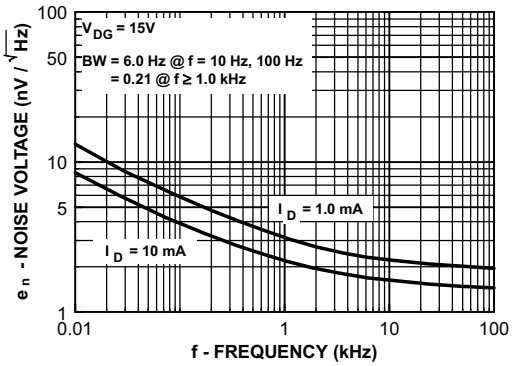
Output Conductance vs Drain Current



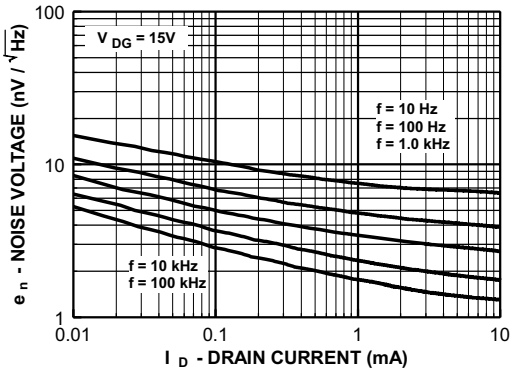
Capacitance vs Voltage



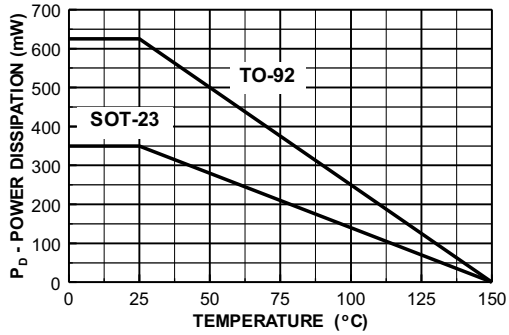
Noise Voltage vs Frequency



Noise Voltage vs Current



Power Dissipation vs Ambient Temperature



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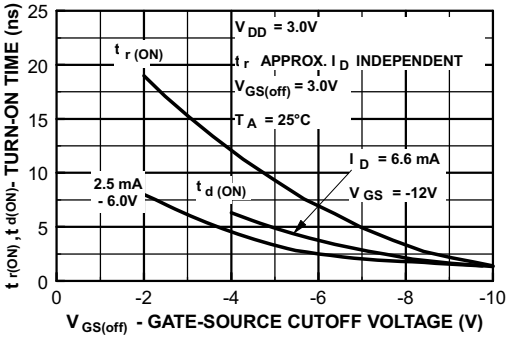
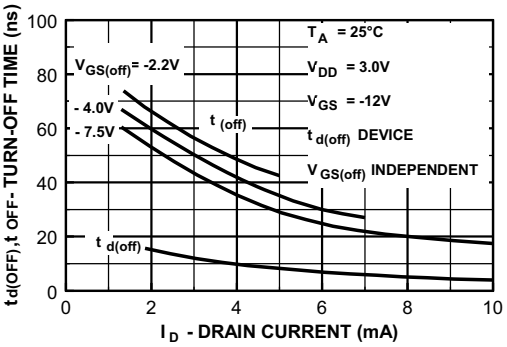
Typical Performance Characteristics (continued)

Switching Turn-On Time vs Gate-Source Voltage



Switching Turn-Off Time vs Drain Current



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