FAIRCHILD SEMICONDUCTOR®

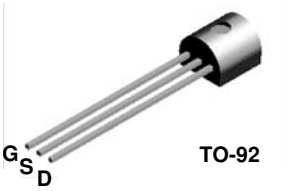
August 2012

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

Features

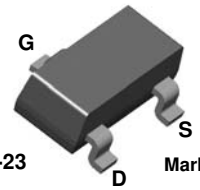
- This device is designed for low level analog switching, sample and hold circuits and chopper stabilized amplifiers.
- Sourced from Process 51.
- Source & Drain are interchangeable.

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".

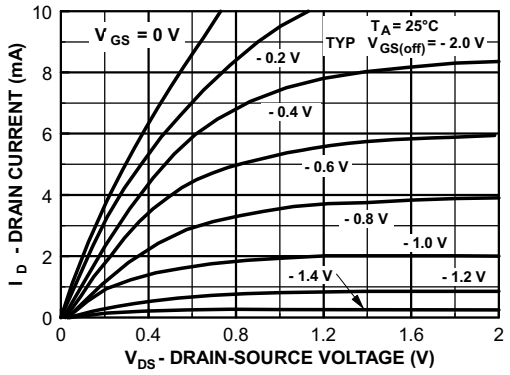
Electrical Characteristics T_a = 25°C unless otherwise noted

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

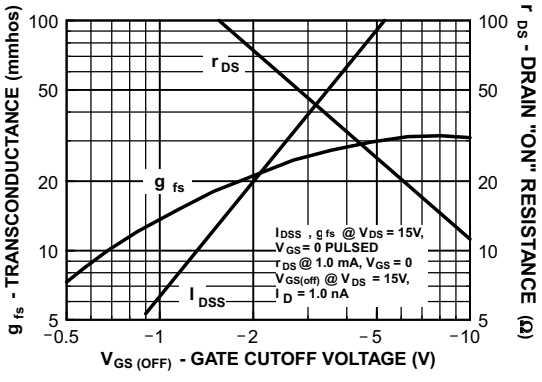
* Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 3.0%

Typical Performance Characteristics

Common Drain-Source

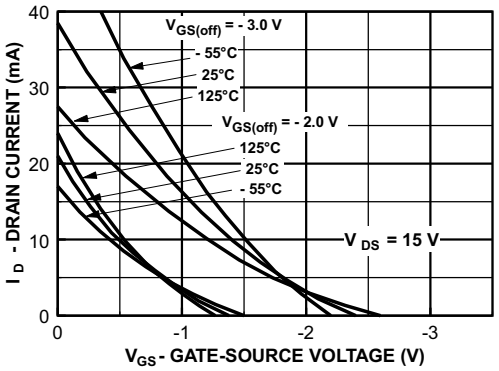


Parameter Interactions

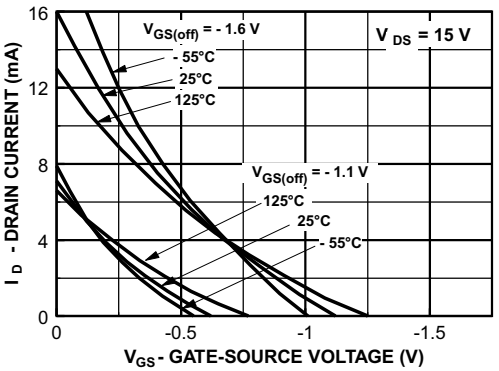


Typical Performance Characteristics (continued)

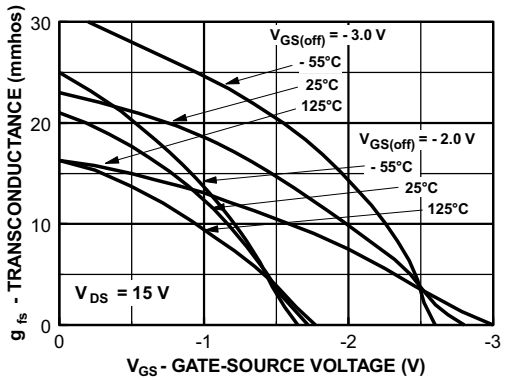
Transfer Characteristics



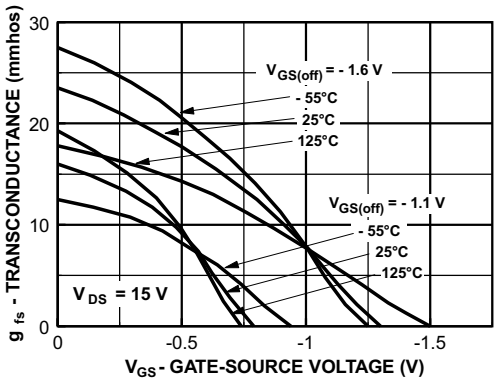
Transfer Characteristics



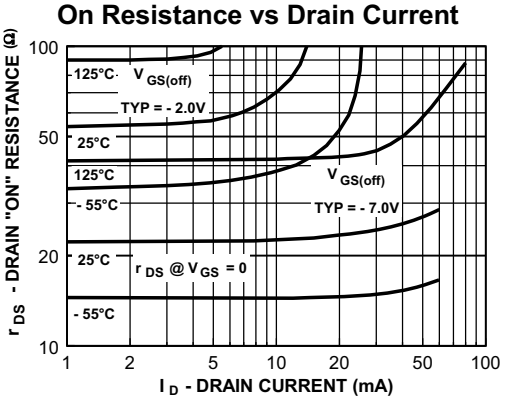
Transfer Characteristics



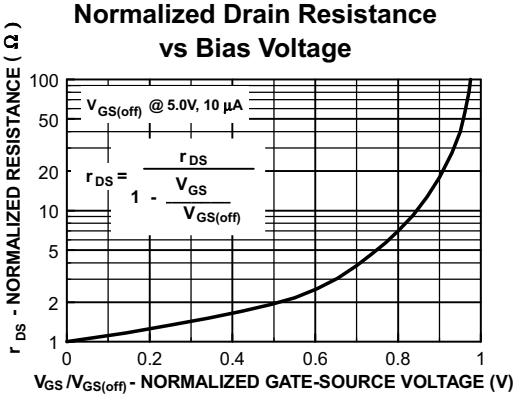
Transfer Characteristics



On Resistance vs Drain Current

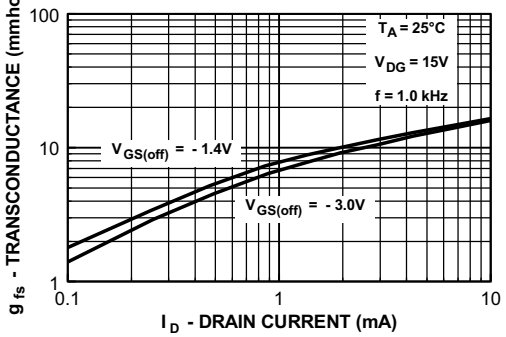


Normalized Drain Resistance vs Bias Voltage

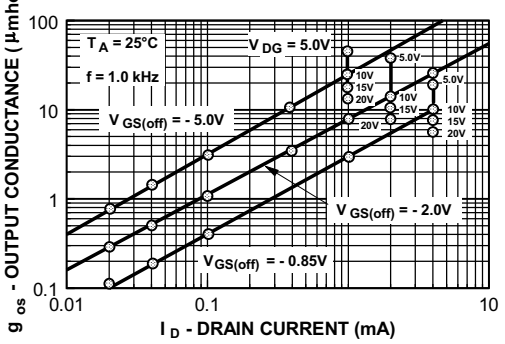


Typical Performance Characteristics (continued)

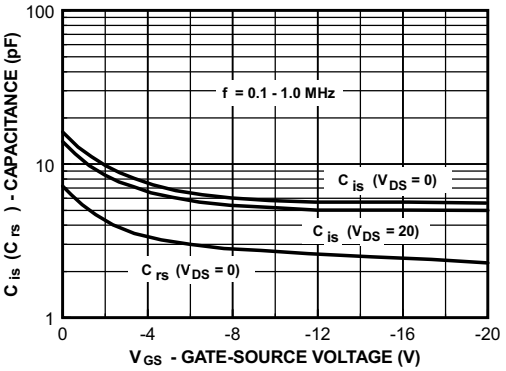
Transconductance vs Drain Current



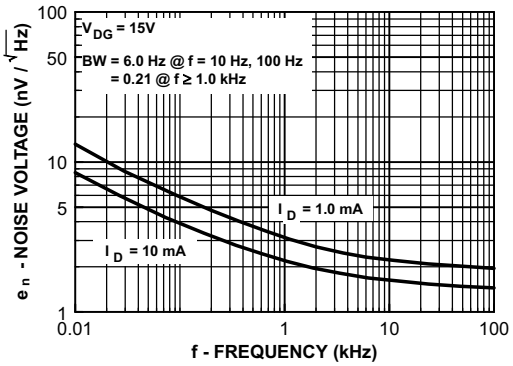
Output Conductance vs Drain Current



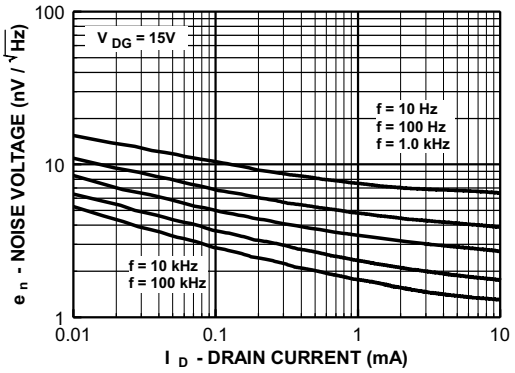
Capacitance vs Voltage



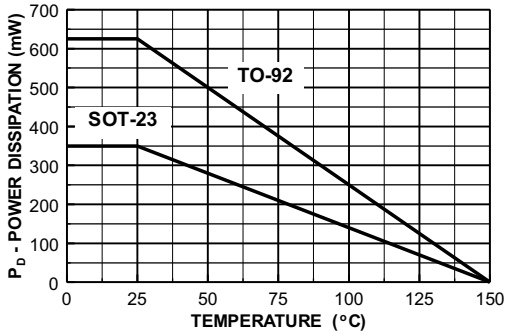
Noise Voltage vs Frequency



Noise Voltage vs Current

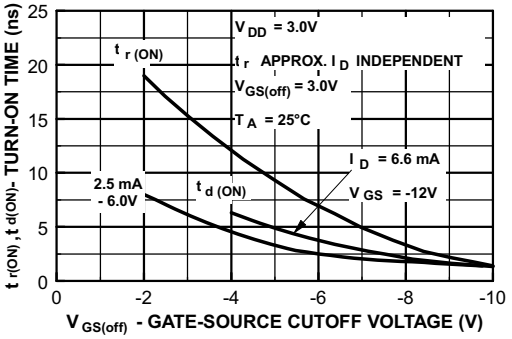


Power Dissipation vs Ambient Temperature

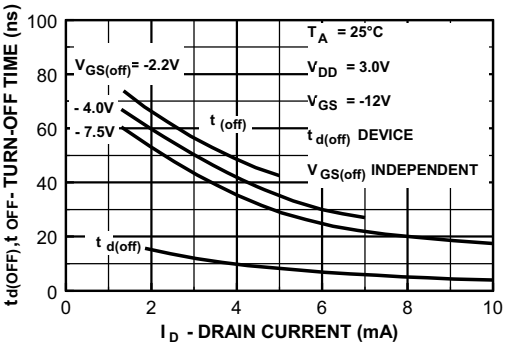


Typical Performance Characteristics (continued)

Switching Turn-On Time vs Gate-Source Voltage



Switching Turn-Off Time vs Drain Current



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