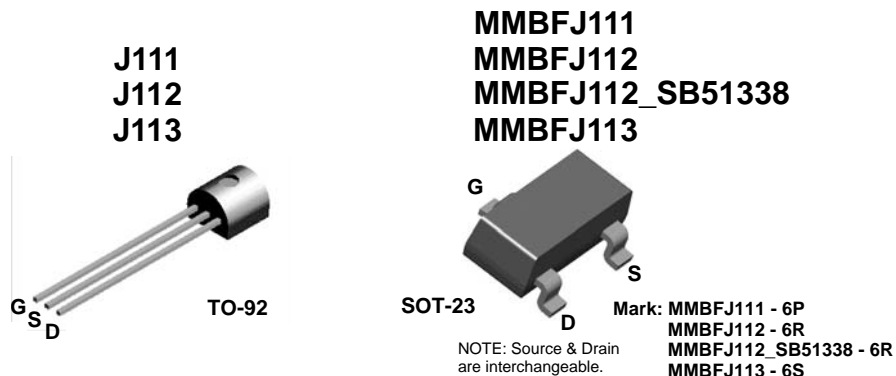


J111 / J112 / J113 / MMBFJ111 / MMBFJ112 / MMBFJ112_SB51338 / MMBFJ113 N-Channel Switch

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.



Absolute Maximum Ratings* $T_a = 25^\circ\text{C}$ 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 | $^\circ\text{C}$ |

* 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 $T_a = 25^\circ\text{C}$ unless otherwise noted

| Symbol | Parameter | Max. | | Units |
|-----------------|---|----------|---------------|----------------------------|
| | | J111-113 | *MMBFJ111-113 | |
| P_D | Total Device Dissipation Derate above 25°C | 625 | 350 | mW |
| | | 5.0 | 2.8 | $\text{mW}/^\circ\text{C}$ |
| $R_{\theta JC}$ | Thermal Resistance, Junction to Case | 125 | | $^\circ\text{C}/\text{W}$ |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient | 357 | 556 | $^\circ\text{C}/\text{W}$ |

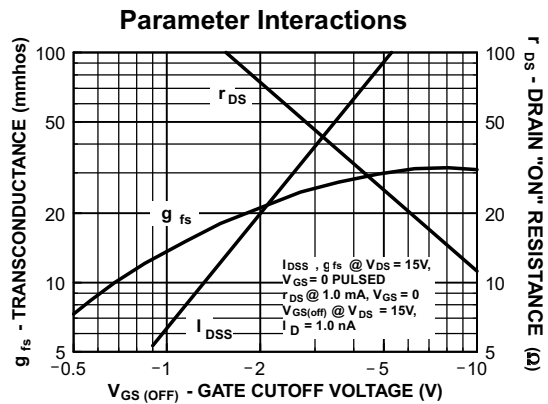
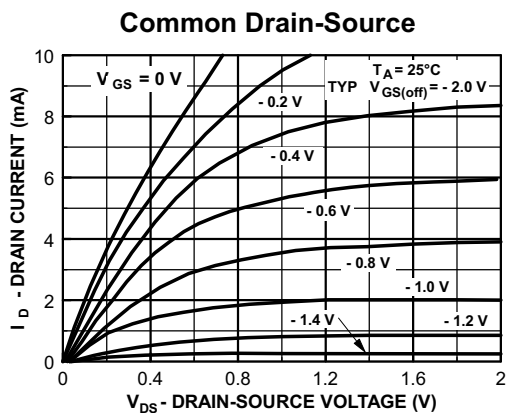
* Device mounted on FR-4 PCB 1.6" X 1.6" X 0.06".

Electrical Characteristics $T_a = 25^\circ\text{C}$ unless otherwise noted

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

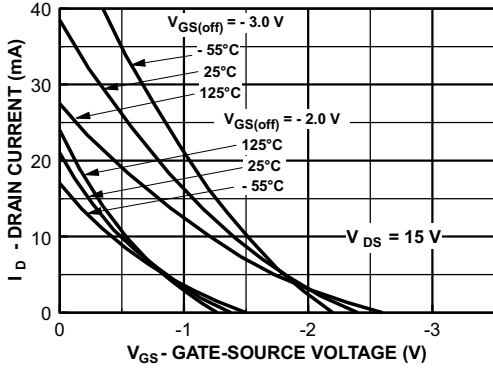
* Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 3.0\%$

Typical Performance Characteristics

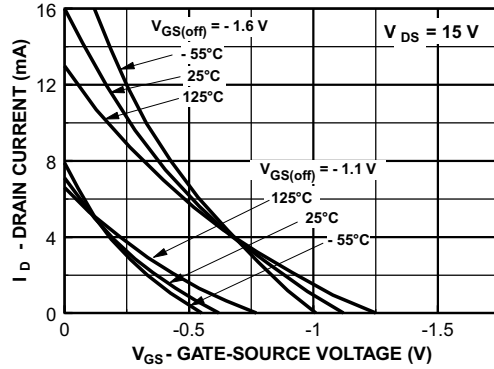


Typical Performance Characteristics (continued)

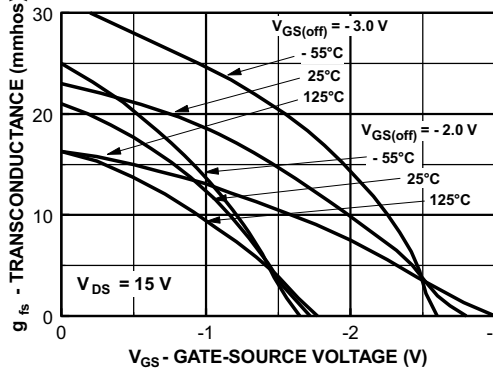
Transfer Characteristics



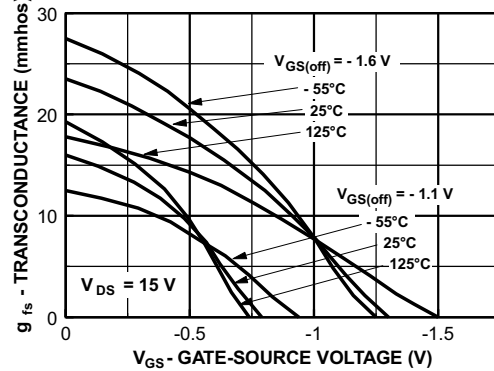
Transfer Characteristics



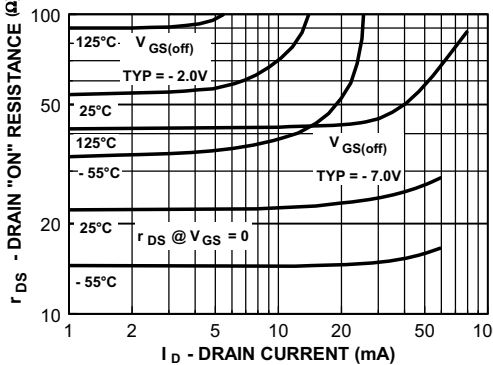
Transfer Characteristics



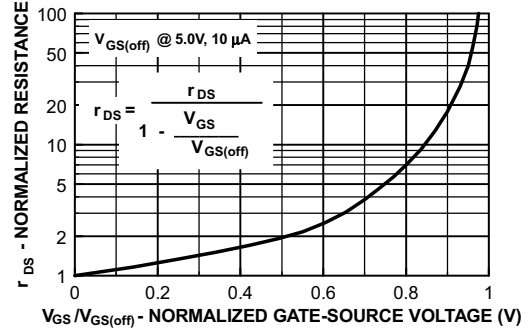
Transfer Characteristics



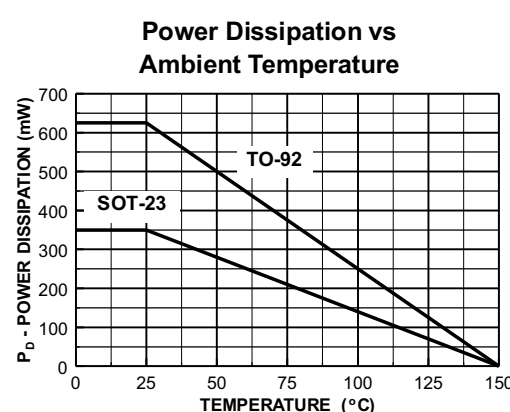
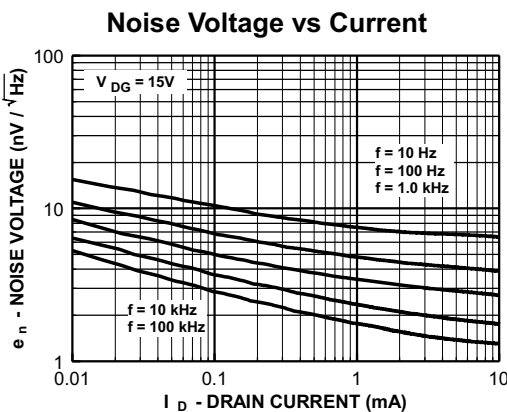
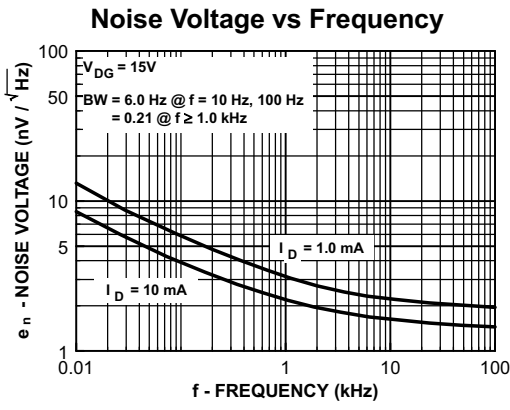
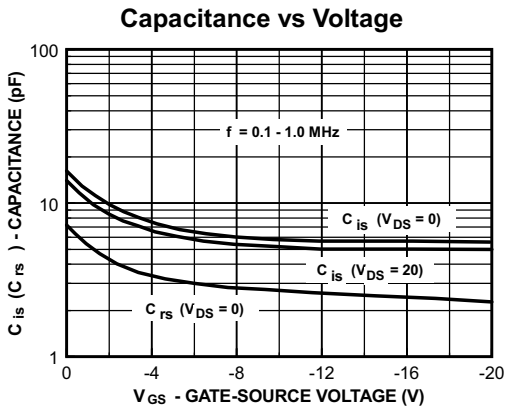
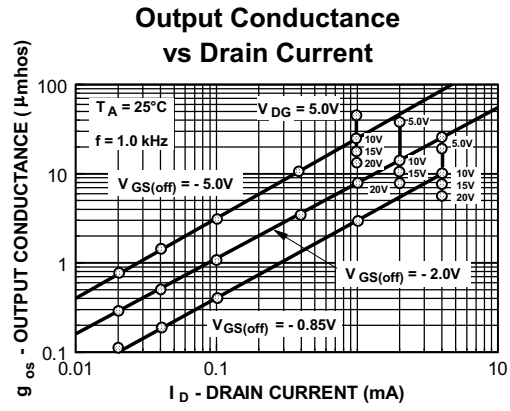
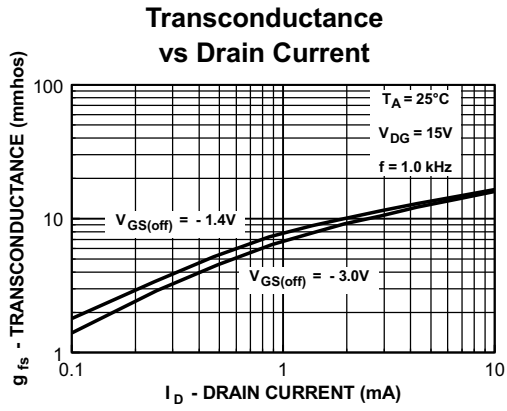
On Resistance vs Drain Current



Normalized Drain Resistance vs Bias Voltage

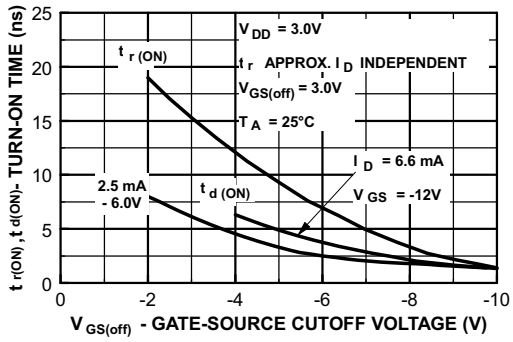


Typical Performance Characteristics (continued)

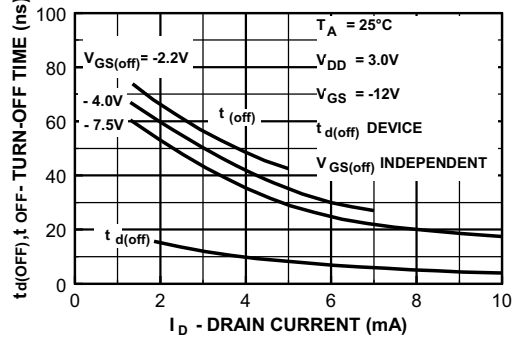


Typical Performance Characteristics (continued)

Switching Turn-On Time vs Gate-Source Voltage







Switching Turn-Off Time vs Drain Current





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