

MMBF4391 thru MMBF4393

CASE 318-02/03, STYLE 10
SOT-23 (TO-236AA/AB)



**JFET
SWITCHING TRANSISTOR**
N-CHANNEL

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	30	Vdc
Drain-Gate Voltage	V_{DG}	30	Vdc
Gate-Source Voltage	V_{GS}	30	Vdc
Forward Gate Current	$I_{G(f)}$	50	mAdc

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
*Total Device Dissipation, $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	350 2.8	mW mW/ $^\circ\text{C}$
Storage Temperature	T_{stg}	150	$^\circ\text{C}$
*Thermal Resistance Junction to Ambient	$R_{\theta JA}$	357	$^\circ\text{C/W}$

*Package mounted on 99.5% alumina 10 x 8 x 0.6 mm.

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted.)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Gate-Source Breakdown Voltage ($I_G = 1.0 \mu\text{Adc}$, $V_{DS} = 0$)	$V_{(BR)GSS}$	30	—	Vdc
Gate Reverse Current ($V_{GS} = 15 \text{ Vdc}$, $V_{DS} = 0$, $T_A = 25^\circ\text{C}$) ($V_{GS} = 15 \text{ Vdc}$, $V_{DS} = 0$, $T_A = 100^\circ\text{C}$)	I_{GSS}	— —	1.0 0.20	nAdc μAdc
Gate Source Cutoff Voltage ($V_{DS} = 15 \text{ Vdc}$, $I_D = 10 \text{ nAdc}$)	$V_{GS(off)}$	4.0 2.0 0.5	10 5.0 3.0	Vdc
ON CHARACTERISTICS				
Zero-Gate-Voltage Drain ($V_{DS} = 15 \text{ V}$, $V_{GS} = 0$)	I_{DSS}	50 25 5.0	150 75 30	mAdc
Drain Current ($V_{DS} = 15 \text{ Vdc}$, $V_{GS} = 12 \text{ Vdc}$) ($V_{DS} = 15$, $V_{GS} = 12 \text{ Vdc}$, $T_A = 100^\circ\text{C}$)	I_D	— —	1.0 1.0	nAdc μAdc
Drain-Source On-Voltage ($I_D = 12 \text{ mAdc}$, $V_{GS} = 0$) ($I_D = 6.0 \text{ mAdc}$, $V_{GS} = 0$) ($I_D = 3.0 \text{ mAdc}$, $V_{GS} = 0$)	$V_{DS(on)}$	— — —	0.4 0.4 0.4	Vdc
Static Drain-Source On Resistance ($I_D = 1.0 \text{ mAdc}$, $V_{GS} = 0$)	$r_{DS(on)}$	— — —	30 60 100	Ohms
SMALL-SIGNAL CHARACTERISTICS				
Input Capacitance ($V_{DS} = 15 \text{ Vdc}$, $V_{GS} = 0$, $f = 1.0 \text{ MHz}$)	C_{iss}	—	14	pF
Reverse Transfer Capacitance ($V_{DS} = 0$, $V_{GS} = 12 \text{ Vdc}$, $f = 1.0 \text{ MHz}$)	C_{rss}	—	3.5	pF

MICROMINIATURE PRODUCTS (continued)

TABLE 11. General-Purpose Field-Effect SOT-23 Transistors

Pinout: 1-Base, 2-Emitter, 3-Collector

N-CHANNEL

Device	Marking	$V_{(BR)GSS}$	Y_{fs}			I_{DSS}	
			Min (mmhos)	Max (mmhos)	V_{DS} (V)	Min (mA)	Max (mA)
MMBF5457	6D	-25	1.0	5.0	15	1.0	5.0
BFR30	M1	-25	1.0	4.0	10	4.0	10
BFR31	M2	-25	1.5	4.5	10	1.0	5.0
MMBF5459	6L	-25	2.0	6.0	15	4.0	16

P-CHANNEL

MMBF5460	6E	40	1.0	4.0	15	1.0	5.0
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TABLE 12. Chopper/Switches, Junction Field-Effect SOT-23 Transistors

N-CHANNEL

Device	Marking	$r_{DS(on)}$ Max (Ohms)	t_{off} Max (ns)	$V_{(BR)GSS}$	$V_{(GS) off}$		I_{DSS}	
					Min (V)	Max (V)	Min (mA)	Max (mA)
MMBF4391	6J	30	20	-30	-4.0	-10	50	150
MMBF4860	6F	40	50	-30	-2.0	-6.0	20	100
MMBF4392	6K	60	35	-30	-2.0	-5.0	25	75
MMBF4393	6G	100	55	-30	-0.5	-3.0	5.0	30

**TABLE 13. SOT-23 Switching Diodes
(Dual Unless Otherwise Noted)**

Diode Pinout: Noted Below

Device	Marking	Description	t_{rr} Max (ns)	V_{BR} Min (V)	I_R Max (μA)	V_F			C_{VR} Max (pF)
						Min (V)	Max (V)	@ I_F (mA)	
MMBD2836	A2	Common Anode (5)	6(1)	75	0.1	—	1.0	10	4.0
BAW56	A1	Common Anode (5)	6(1)	70	2.5	—	1.1	50	1.5
MMBD2835	A3	Common Anode (5)	6(1)	35	0.1	—	1.0	10	4.0
BAV74	JA	Common Cathode (3)	2(2)	50	0.1	—	1.0	100	2.0
MMBD2838	A6	Common Cathode (3)	6(1)	75	0.1	—	1.0	10	4.0
BAV70	A4	Common Cathode (3)	6(1)	70	2.5	—	1.1	50	1.5
MMBD2837	A5	Common Cathode (3)	6(1)	35	0.1	—	1.0	10	4.0
MMBD6100	5B	Common Cathode (3)	15(1)	70	0.1	0.85	1.1	100	2.5
MMBD914	5D	Single (6)	4(2)	100	0.05	—	1.0	10	4.0
BAS16	A6	Single (6)	6(1)	75	1.0	—	0.715	1.0	2.0
BAL99	TF	Single (7)	6(1)	70	2.5	—	1.1	50	1.5
MMBD6050	5A	Single (6)	10(1)	70	0.1	0.85	1.1	100	2.5
BAV99	A7	Series (4)	6(1)	70	2.5	—	1.1	50	1.5
MMBD7000	5C	Series (4)	15(1)	100	0.3	0.75	1.1	100	1.5

NOTES: (1) $I_F = I_R = 10$ mA, $V_R = 5.0$ V, $I_{RR} = 1.0$ mA
(2) $I_F = I_R = 10$ mA, $V_R = 6.0$ V, $I_{RR} = 1.0$ mA
(3) Pinout: 1-Anode, 2-Anode, 3-Cathode
(4) Pinout: 1-Anode, 2-Cathode, 3-Cathode and Anode
(5) Pinout: 1-Cathode, 2-Cathode, 3-Anode
(6) Pinout: 1-Anode, 2-N.C., 3-Cathode
(7) Pinout: 1-N.C., 2-Anode, 3-Cathode

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