

J175 / J176 / MMBFJ175 / MMBFJ176 / MMBFJ177 P-Channel Switch

Description

This device is designed for low-level analog switching sample-and-hold circuits and chopper-stabilized amplifiers. Sourced from process 88.



Note: Source & drain are interchangeable.

Figure 2. MMBFJ175 / 176 / 177 Device Package

SOT-23

Mark: 6W / 6X / 6Y

Figure 1. J175 / J176 Device Package

Ordering Information

Part Number	Marking	Package	Packing Method
J175-D26Z	J175	TO-92 3L	Tape and Reel
J176-D74Z	J176	TO-92 3L	Ammo
MMBFJ175	6W	SOT-23 3L	Tape and Reel
MMBFJ176	6X	SOT-23 3L	Tape and Reel
MMBFJ177	6Y	SOT-23 3L	Tape and Reel

Absolute Maximum Ratings(1),(2)

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at $T_A = 25^{\circ}C$ unless otherwise noted.

Symbol	Parameter	Value	Unit
V_{DG}	Drain-Gate Voltage	-30	V
V_{GS}	Gate-Source Voltage	30	V
I_{GF}	Forward Gate Current	50	mA
T _J , T _{STG}	Operating and Storage Junction Temperature Range	-55 to + 150	°C

Notes:

- 1. These ratings are based on a maximum junction temperature of 150°C.
- 2. These are steady-state limits. ON Semiconductor should be consulted on applications involving pulsed or lowduty cycle operations.

Thermal Characteristics

Values are at $T_A = 25$ °C unless otherwise noted.

		Ma		
Symbol	Parameter	J175 / J176 ⁽³⁾	76 ⁽³⁾ MMBFJ176 / MMBFJ177 ⁽³⁾ 225 1.8 n	Unit
P _D	Total Device Dissipation	350	225	mW
	Derate Above 25°C	2.8	1.8	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

Note:

3. PCB size: FR-4, 76 mm x 114 mm x 1.57 mm (3.0 inch x 4.5 inch x 0.062 inch) with minimum land pattern size.

Electrical Characteristics

Values are at $T_A = 25^{\circ}C$ unless otherwise noted.

Symbol	Parameter	Conditions		Min.	Max.	Unit
Off Charact	eristics					
V _{(BR)GSS}	Gate-Source Breakdown Voltage	$I_G = 1.0 \mu A, V_{DS} = 0$		30		V
I _{GSS}	Gate Reverse Current	V _{GS} = 20 V, V _{DS} = 0			1.0	nA
V _{GS(off)}	Gate-Source Cut-Off Voltage	V _{DS} = -15 V, I _D = -10 nA	J175 / MMBFJ175	3.0	6.0	V
			J176 / MMBFJ176	1.0	4.0	
			MMBFJ177	0.8	2.5	
On Charact	eristics					
I _{DSS}	Zero-Gate Voltage Drain Current ⁽⁴⁾	V _{DS} = -15 V, I _{GS} = 0	J175 / MMBFJ175	-7.0	-60.0	mA
			J176 / MMBFJ176	-2.0	-25.0	
			MMBFJ177	-1.5	-20.0	
r _{DS(on)}	Drain-Source On Resistance	$V_{DS} \le 0.1 \text{ V}, V_{GS} = 0$	J175 / MMBFJ175		125	
			J176 / MMBFJ176		250	Ω
			MMBFJ177		300	

Note:

4. Pulse test: pulse width $\leq 300~\mu s,$ duty cycle $\leq 2.0\%.$

Typical Performance Characteristics

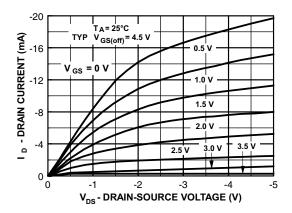


Figure 3. Common Drain-Source

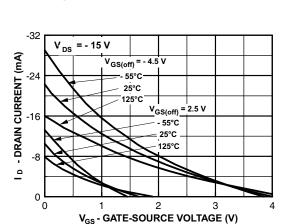


Figure 5. Transfer Characteristics

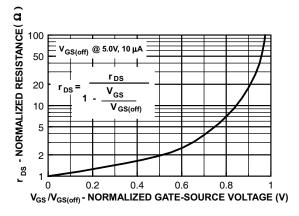


Figure 7. Normalized Drain Resistance vs. Bias Voltage

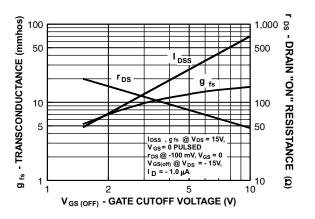


Figure 4. Parameter Interactions

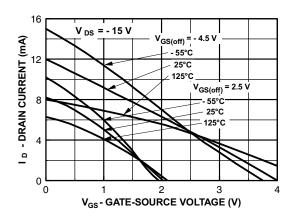


Figure 6. Transfer Characteristics

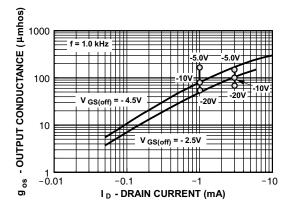


Figure 8. Output Conductance vs. Drain Current

Typical Performance Characteristics (Continued)

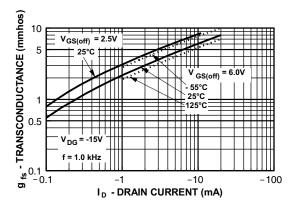


Figure 9. Transconductance vs. Drain Current

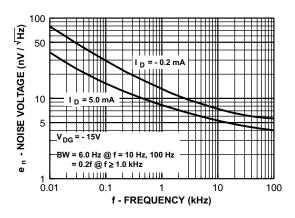


Figure 11. Noise Voltage vs. Frequency

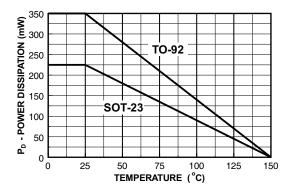


Figure 13. Power Dissipation vs. Ambient Temperature

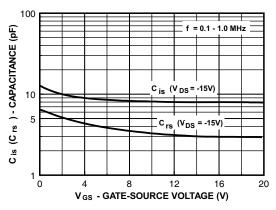


Figure 10. Capacitance vs. Voltage

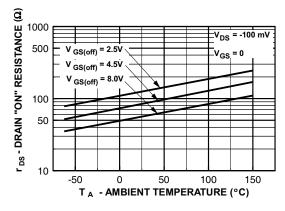
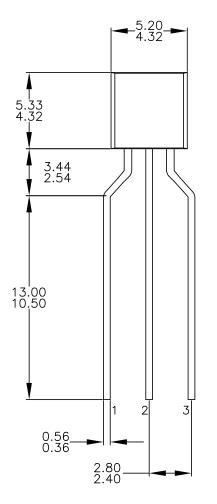
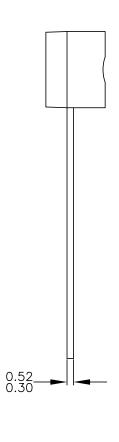
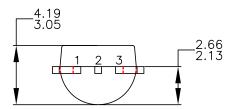


Figure 12. Channel Resistance vs. Temperature

Physical Dimensions







NOTES: UNLESS OTHERWISE SPECIFIED

- DRAWING CONFORMS TO JEDEC MS-013, VARIATION AC.
 ALL DIMENSIONS ARE IN MILLIMETERS.
 DRAWING CONFORMS TO ASME Y14.5M-2009.
 DRAWING FILENAME: MKT-ZAO3FREV3.
 ON SEMICONDUCTOR

Figure 14. 3-Lead, TO-92, Molded, 0.2 In Line Spacing Lead Form

Physical Dimensions (Continued) 0.95 2.92±0.20 3 1.40 1.30+0.20 2.20 2 0.60 0.37 (0.29) -0.95 ⊕ 0.20M A B 1.00 1.90 1.90 LAND PATTERN RECOMMENDATION 1.20 MAX SEE DETAIL A (0.93)0.10 0.00 △ 0.10∭ C C 2.40±0.30 NOTES: UNLESS OTHERWISE SPECIFIED **GAGE PLANE** A) REFERENCE JEDEC REGISTRATION TO-236, VARIATION AB, ISSUE H. B) ALL DIMENSIONS ARE IN MILLIMETERS. 0.23 0.08 C) DIMENSIONS ARE INCLUSIVE OF BURRS, 0.25 MOLD FLASH AND TIE BAR EXTRUSIONS. D) DIMENSIONING AND TOLERANCING PER ASME Y14.5M - 1994. 0.20 MIN **SEATING** E) DRAWING FILE NAME: MA03DREV10 **PLANE** (0.55)DETAIL A

Figure 15. 3-LEAD, SOT23, JEDEC TO-236, LOW PROFILE

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