

Analog Power AM20P02-99D MOSFET Datasheet

<http://www.manuallib.com/analog-power/am20p02-99d-mosfet-datasheet.html>

These miniature surface mount MOSFETs utilize a high cell density trench process to provide low $r_{DS(on)}$ and to ensure minimal power loss and heat dissipation. Typical applications are DC-DC converters and power management in portable and battery-powered products such as computers, printers, and cordless telephones.

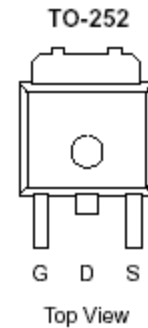
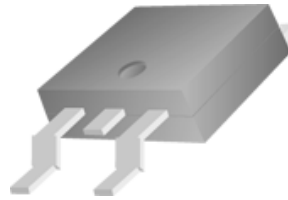
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P-Channel 20-V (D-S) MOSFET

These miniature surface mount MOSFETs utilize High Cell Density process. Low $r_{DS(on)}$ assures minimal power loss and conserves energy, making this device ideal for use in power management circuitry. Typical applications are PWMDC-DC converters, power management in portable and battery-powered products such as computers, printers, battery charger, telecommunication power system, and telephones power system.

- Low $r_{DS(on)}$ Provides Higher Efficiency and Extends Battery Life
- Miniature TO-252 Surface Mount Package Saves Board Space
- High power and current handling capability
- Extended VGS range (± 25) for battery pack applications

**PRODUCT SUMMARY**

V_{DS} (V)	$r_{DS(on)}$ (m Ω)	I_D (A)
-20	118 @ $V_{GS} = -4.5V$	17
	178 @ $V_{GS} = -2.5V$	14

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ C$ UNLESS OTHERWISE NOTED)				
Parameter		Symbol	Maximum	Units
Drain-Source Voltage		V_{DS}	-20	V
Gate-Source Voltage		V_{GS}	± 12	
Continuous Drain Current ^a	$T_A = 25^\circ C$	I_D	17	A
Pulsed Drain Current ^b		I_{DM}	± 40	
Continuous Source Current (Diode Conduction) ^a		I_S	-30	A
Power Dissipation ^a	$T_A = 25^\circ C$	P_D	50	W
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 175	$^\circ C$

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Maximum	Units
Maximum Junction-to-Ambient ^a	$R_{\theta JA}$	50	$^\circ C/W$
Maximum Junction-to-Case	$R_{\theta JC}$	3.0	$^\circ C/W$

Notes

- Surface Mounted on 1" x 1" FR4 Board.
- Pulse width limited by maximum junction temperature

SPECIFICATIONS (T _A = 25°C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Conditions	Limits			Unit
			Min	Typ	Max	
Static						
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250 uA	-0.7			
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±25 V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -16 V, V _{GS} = 0 V			-1	uA
		V _{DS} = -16 V, V _{GS} = 0 V, T _J = 55°C			-5	
On-State Drain Current ^A	I _{D(on)}	V _{DS} = -5 V, V _{GS} = -4.5 V	-41			A
Drain-Source On-Resistance ^A	r _{DS(on)}	V _{GS} = -4.5 V, I _D = -17 A			118	mΩ
		V _{GS} = -2.5 V, I _D = -14 A			178	
Forward Tranconductance ^A	g _{fs}	V _{DS} = -10 V, I _D = -17 A		31		S
Diode Forward Voltage	V _{SD}	I _S = -41 A, V _{GS} = 0 V		-0.7		V
Dynamic ^b						
Total Gate Charge	Q _g	V _{DS} = -10 V, V _{GS} = -4.5 V, I _D = -21 A		12.2		nC
Gate-Source Charge	Q _{gs}			1.1		
Gate-Drain Charge	Q _{gd}			1.5		
Switching						
Turn-On Delay Time	t _{d(on)}	V _{DD} = -10 V, R _L = 15 Ω , ID = -41 A, VGEN = -4.5 V, RG = 6Ω		15		nS
Rise Time	t _r			12		
Turn-Off Delay Time	t _{d(off)}			62		
Fall-Time	t _f			46		

Notes

- Pulse test: $PW \leq 300\text{us}$ duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.

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Technical drawing of a mechanical part with dimensions and labels:

- Top view dimensions:
 - Overall width: 2.50
 - Inner width: 2.21
 - Height: 1.3
- Side view dimensions:
 - Overall height: 1.02
 - Inner height: 0.46
 - Width: 1.14
 - Inner width: 0.76
- Bottom view dimensions:
 - Overall width: 2.50
 - Inner width: 2.21
 - Height: 1.3
 - Inner height: 0.46
 - Width: 1.14
 - Inner width: 0.76
- Labels:
 - A
 - B
 - C
 - D
 - E
 - F
 - G
 - H
 - I
 - J
 - K
 - L
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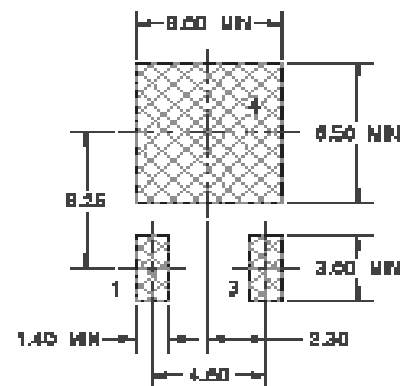
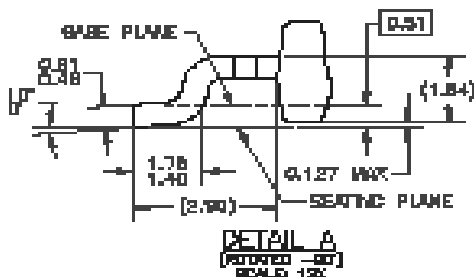
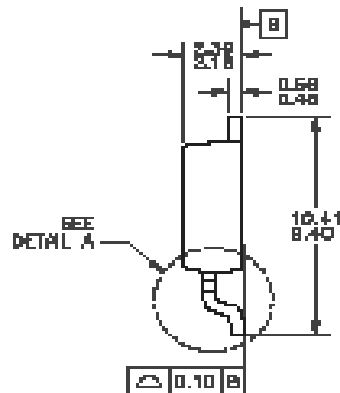


Figure 1 is a schematic diagram of the test cell. It shows a cross-section of a rectangular cell. In the center is a small circle labeled '2', representing the sample. This sample is positioned between two vertical electrodes, labeled '1' on the left and '3' on the right. The electrodes are connected to a power source, indicated by a battery symbol. The space between the electrodes and around the sample is filled with a fluid, labeled '4'. The fluid is also indicated by a note 'SEE NOTE D' with a line pointing to it. Dimensions are shown: 'E1' is the horizontal distance between the electrodes, and 'D1' is the vertical distance between the electrodes. A small gap is shown between the electrodes and the sample.



A) ALL DIMENSIONS ARE IN MILLIMETERS.
B) THIS PACKAGE CONFORMS TO JEDEC, TO-262,
ISSUE C, VARIATION AA IN 05, DATED MAY 1999.
C) DIMENSIONING AND TOLERANCING PER
ASME Y14.5M-1994.
D) HEAT SINK TOP EDGE COULD BE IN CHAMFERED
CORNERS OR EDGE PROTRUSION.
E) DIMENSIONS 13.0-13.1 AND 1 TABLE.

	OPTION A1	OPTION A2
L2	0.00-1.27	1.63-2.92
D	0.17-0.60	0.33-0.60
E1	4.33 MM	3.61 MM
D1	3.33 MM	4.33 MM