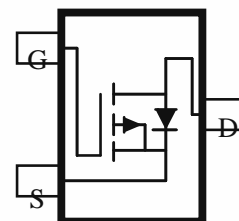
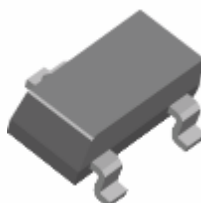


## P-Channel 20-V (D-S) MOSFET

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 DC-DC converters, power management in portable and battery-powered products such as computers, printers, PCMCIA cards, cellular and cordless telephones.

- Low  $r_{DS(on)}$  Provides Higher Efficiency and Extends Battery Life
- Miniature SOT-23 Surface Mount Package Saves Board Space
- Fast switching speed
- High performance trench technology

PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ (OHM)	$I_D$ (A)
-20	0.052 @ $V_{GS} = -4.5V$	-3.6
	0.072 @ $V_{GS} = -2.5V$	-3.1
	0.120 @ $V_{GS} = -1.8V$	-2.7



ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)			
Parameter	Symbol	Ratings	Units
Drain-Source Voltage	$V_{DS}$	-20	V
Gate-Source Voltage	$V_{GS}$	$\pm 8$	
Continuous Drain Current <sup>a</sup>	$I_D$	$T_A=25^\circ\text{C}$	-3.6
		$T_A=70^\circ\text{C}$	-1.8
Pulsed Drain Current <sup>b</sup>	$I_{DM}$	-10	A
Continuous Source Current (Diode Conduction) <sup>a</sup>	$I_S$	$\pm 0.46$	A
Power Dissipation <sup>a</sup>	$P_D$	$T_A=25^\circ\text{C}$	1.25
		$T_A=70^\circ\text{C}$	0.8
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 to 150	$^\circ\text{C}$

THERMAL RESISTANCE RATINGS			
Parameter	Symbol	Maximum	Units
Maximum Junction-to-Ambient <sup>a</sup>	$R_{THJA}$	$t \leq 5$ sec	100
		Steady-State	150

### Notes

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

SPECIFICATIONS (T <sub>A</sub> = 25° C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Conditions	Limits			Unit
			Min	Typ	Max	
<b>Static</b>						
Gate-Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250 uA	-0.7			
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±8 V			±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = -16 V, V <sub>GS</sub> = 0 V			-1	uA
		V <sub>DS</sub> = -16 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 55°C			-10	
On-State Drain Current <sup>A</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> = -5 V, V <sub>GS</sub> = -4.5 V	-10			A
Drain-Source On-Resistance <sup>A</sup>	r <sub>Ds(on)</sub>	V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -3.6 A			52	mΩ
		V <sub>GS</sub> = -2.5 V, I <sub>D</sub> = -3.1 A			72	
		V <sub>GS</sub> = -1.8 V, I <sub>D</sub> = -2.7 A			120	
Forward Transconductance <sup>A</sup>	g	V <sub>GS</sub> = -5 V, I <sub>D</sub> = -1.25 A		12		S
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> <sup>DS</sup> = -0.46 A, V <sub>GS</sub> = 0 V		-0.60		V
<b>Dynamic<sup>b</sup></b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = -5 V, V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -2.4 A		12.0		nC
Gate-Source Charge	Q <sub>gs</sub>			2.0		
Gate-Drain Charge	Q <sub>gd</sub>			2.0		
Input Capacitance	C <sub>iss</sub>	P-Channel V <sub>DS</sub> = -15V, V <sub>GS</sub> = 0V, f = 1MHz		1312		pF
Output Capacitance	C <sub>oss</sub>			130		
Reverse Transfer Capacitance	C <sub>rss</sub>			106		
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = -10 V, I <sub>L</sub> = -1 A, V <sub>GEN</sub> = -4.5 V, R <sub>G</sub> = 6 Ω		6.5		ns
Rise Time	t <sub>r</sub>			20		
Turn-Off Delay Time	t <sub>d(off)</sub>			31		
Fall-Time	t <sub>f</sub>			21		

Notes

- a. Pulse test: PW ≤ 300us duty cycle ≤ 2%.
- b. Guaranteed by design, not subject to production testing.

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### Typical Electrical Characteristics

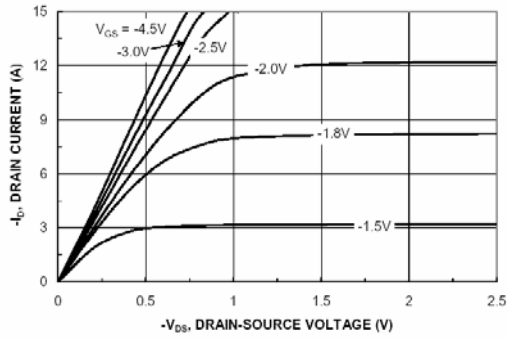


Figure 1. On-Region Characteristics

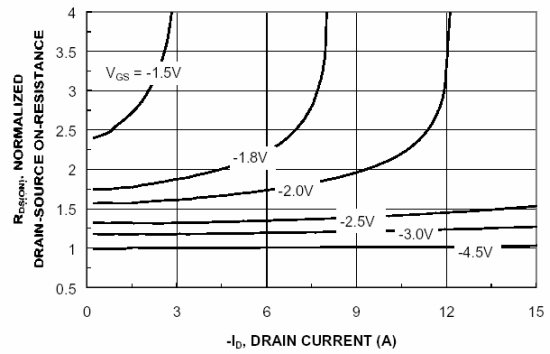


Figure 2. On-Resistance Variation with Drain Current and Gate Voltage

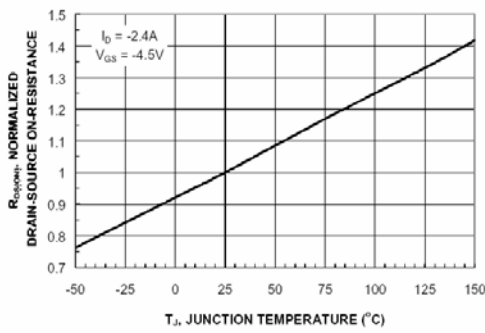


Figure 3. On-Resistance Variation with Temperature

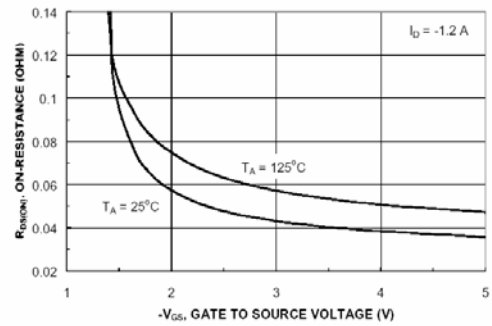


Figure 4. On-Resistance Variation with Gate to Source Voltage

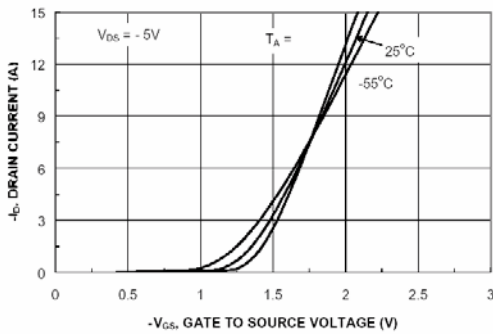


Figure 5. Transfer Characteristics

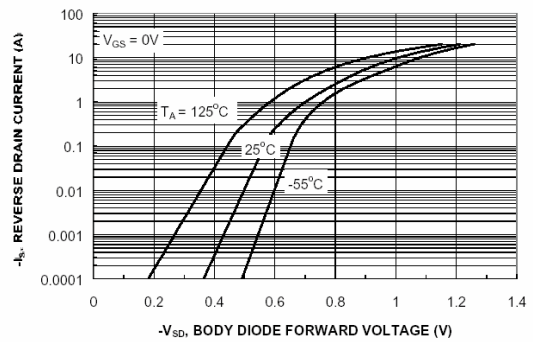


Figure 6. Body Diode Forward Voltage Variation with Source Current and Temperature

### Typical Electrical Characteristics

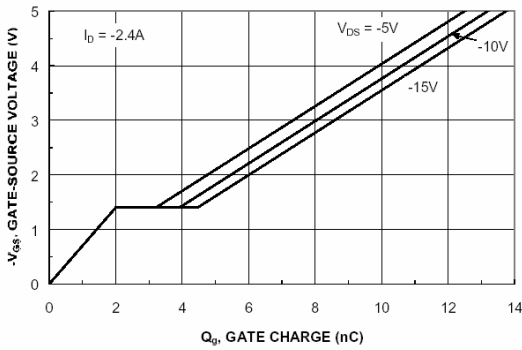


Figure 7. Gate Charge Characteristic

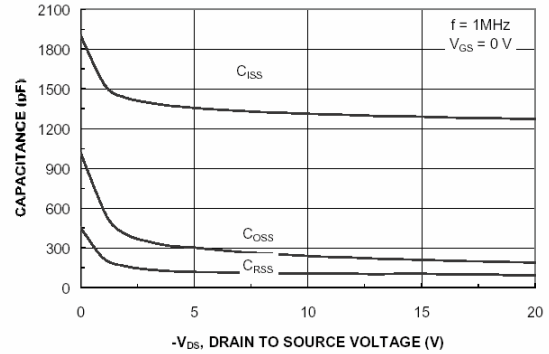


Figure 8. Capacitance Characteristic

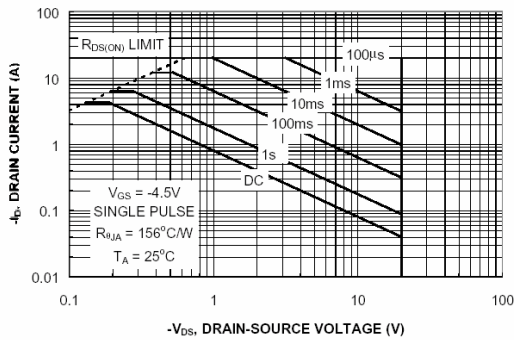


Figure 9. Maximum Safe Operating Area

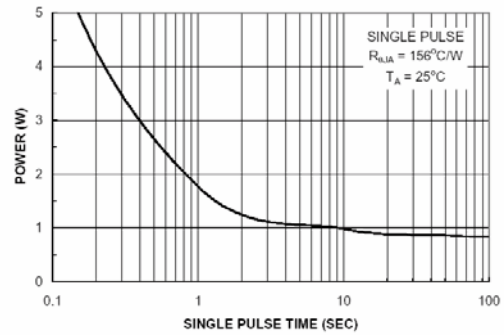


Figure 10. Single Pulse Maximum Power Dissipation

### Normalized Thermal Transient Junction to Ambient

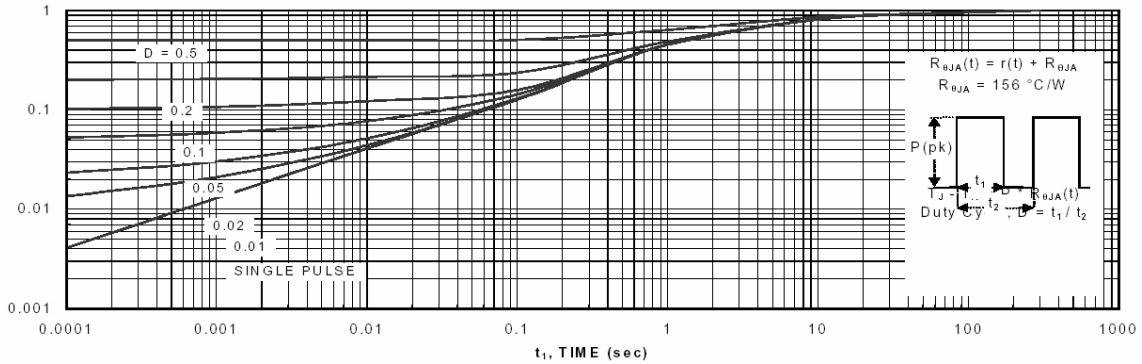
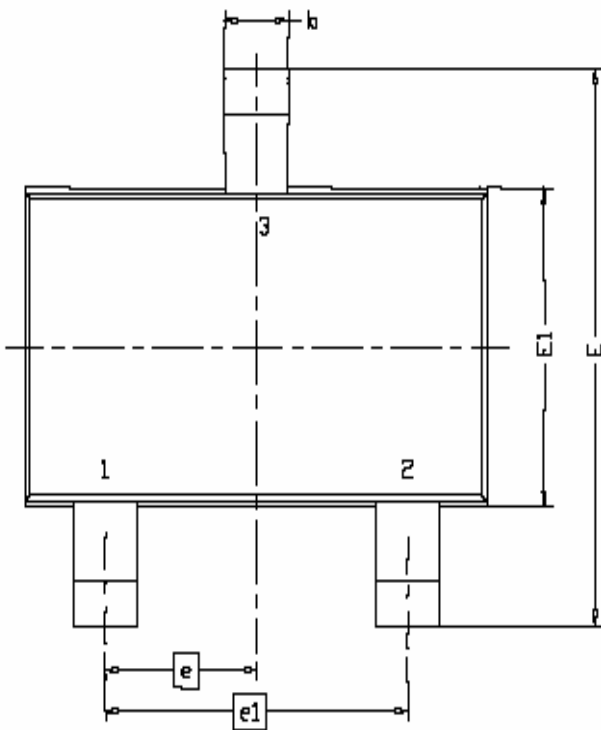
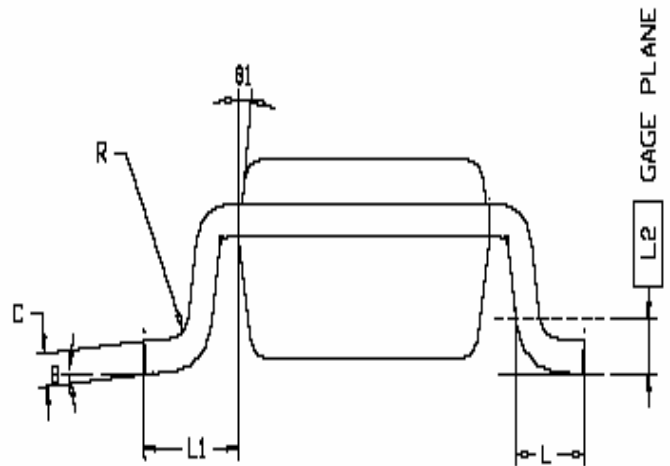
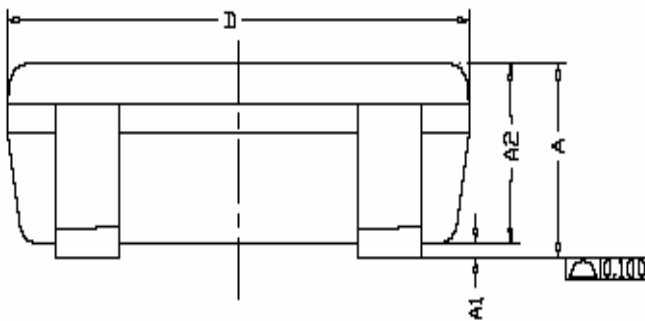


Figure 11. Transient Thermal Response Curve.

# Package Information



DIM.	MILLIMETERS		
	MIN	NOM	MAX
A	0.935	0.95	1.10
A1	0.01	---	0.10
A2	0.85	0.90	0.925
b	0.30	0.40	0.50
c	0.10	0.15	0.25
D	2.70	2.90	3.10
E	2.60	2.80	3.00
E1	1.40	1.60	1.80
e	0.95 BSC		
e1	1.90 BSC		
L	0.30	0.40	0.60
L1	0.60REF		
L2	0.25BSC		
R	0.10	---	---
$\theta$	0°	4°	8°
$\theta1$	7°NOM		



# Ordering information

- AM2327P-T1-XX
  - A: Analog Power
  - M: MOSFET
  - 2327: Part number
  - P: P-Channel
  - T1: Tape & reel
  - XX: Blank: Standard  
PF: Leadfree