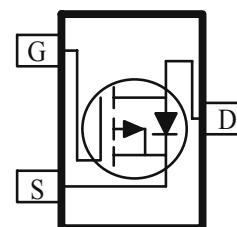
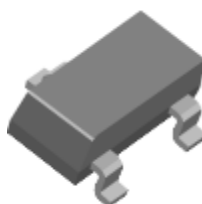


**P-Channel 20-V (D-S) MOSFET**

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 ( $T_A = 25^\circ C$ 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>	$T_A=25^\circ C$	$I_D$	-3.6	A
	$T_A=70^\circ C$		-1.8	
Pulsed Drain Current <sup>b</sup>		$I_{DM}$	-10	
Continuous Source Current (Diode Conduction) <sup>a</sup>		$I_S$	$\pm 0.46$	A
Power Dissipation <sup>a</sup>	$T_A=25^\circ C$	$P_D$	1.25	W
	$T_A=70^\circ C$		0.8	
Operating Junction and Storage Temperature Range		$T_J, T_{stg}$	-55 to 150	$^\circ C$

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

Notes

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

SPECIFICATIONS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Conditions	Limits			Unit
			Min	Typ	Max	
<b>Static</b>						
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250 \mu\text{A}$	-0.7			
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 8 \text{ V}$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -16 \text{ V}, V_{GS} = 0 \text{ V}$			-1	uA
		$V_{DS} = -16 \text{ V}, V_{GS} = 0 \text{ V}, T_J = 55^\circ\text{C}$			-10	
On-State Drain Current <sup>A</sup>	$I_{D(on)}$	$V_{DS} = -5 \text{ V}, V_{GS} = -4.5 \text{ V}$	-10			A
Drain-Source On-Resistance <sup>A</sup>	$r_{DS(on)}$	$V_{GS} = -4.5 \text{ V}, I_D = -3.6 \text{ A}$			52	m $\Omega$
		$V_{GS} = -2.5 \text{ V}, I_D = -3.1 \text{ A}$			72	
		$V_{GS} = -1.8 \text{ V}, I_D = -2.7 \text{ A}$			120	
Forward Transconductance <sup>A</sup>	$g_s$	$V_{DS} = -5 \text{ V}, I_D = -1.25 \text{ A}$		12		S
Diode Forward Voltage	$V_{SD}$	$I_S = -0.46 \text{ A}, V_{GS} = 0 \text{ V}$		-0.60		V
<b>Dynamic<sup>b</sup></b>						
Total Gate Charge	$Q_g$	$V_{DS} = -5 \text{ V}, V_{GS} = -4.5 \text{ V},$ $I_D = -2.4 \text{ A}$		12.0		nC
Gate-Source Charge	$Q_{gs}$			2.0		
Gate-Drain Charge	$Q_{gd}$			2.0		
Input Capacitance	$C_{iss}$	P-Channel $V_{DS} = -15 \text{ V}, V_{GS} = 0 \text{ V}, f = 1 \text{ MHz}$		1312		pF
Output Capacitance	$C_{oss}$			130		
Reverse Transfer Capacitance	$C_{rss}$			106		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -10 \text{ V}, I_L = -1 \text{ A},$ $V_{GEN} = -4.5 \text{ V}, R_G = 6 \Omega$		6.5		ns
Rise Time	$t_r$			20		
Turn-Off Delay Time	$t_{d(off)}$			31		
Fall-Time	$t_f$			21		

### Notes

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

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Typical Electrical Characteristics

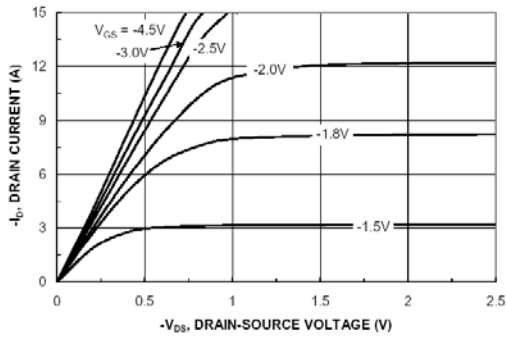


Figure 1. On-Region Characteristics

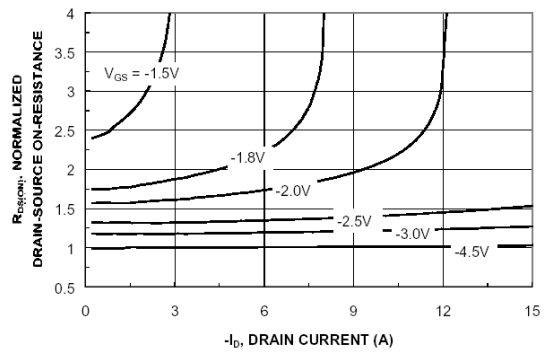


Figure 2. On-Resistance Variation with Drain Current and Gate Voltage

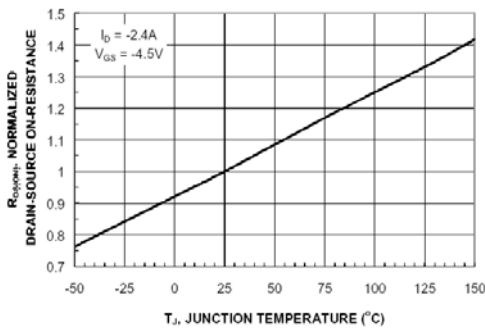


Figure 3. On-Resistance Variation with Temperature

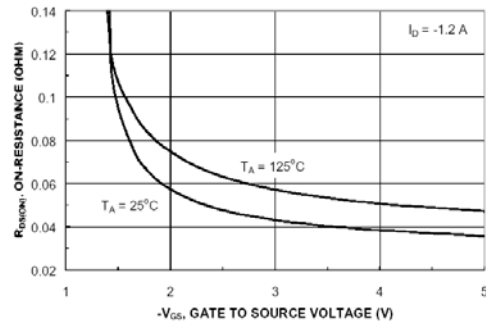


Figure 4. On-Resistance Variation with Gate to Source Voltage

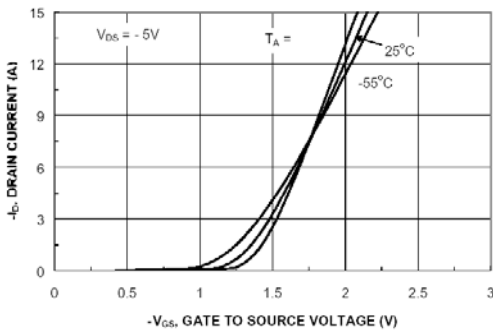


Figure 5. Transfer Characteristics

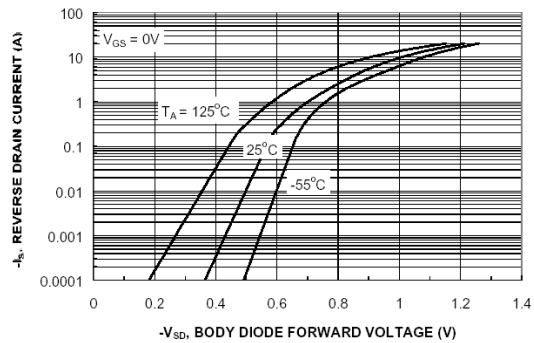


Figure 6. Body Diode Forward Voltage Variation with Source Current and Temperature

### Typical Electrical Characteristics

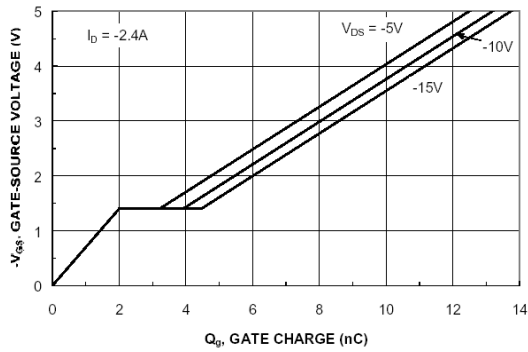


Figure 7. Gate Charge Characteristic

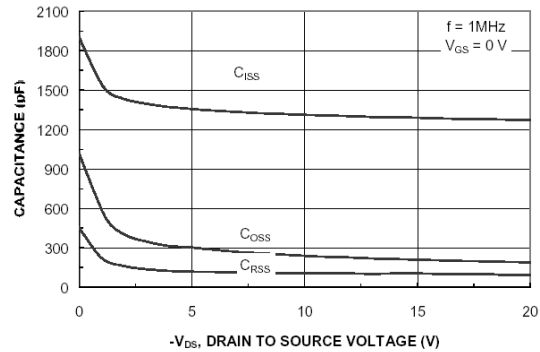


Figure 8. Capacitance Characteristic

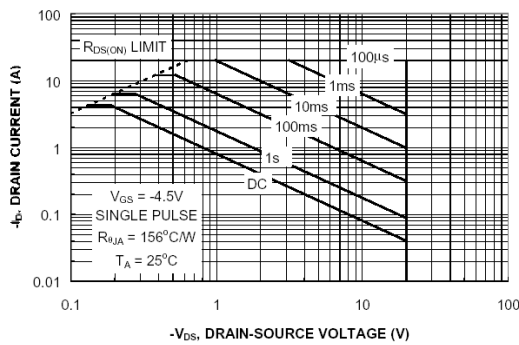


Figure 9. Maximum Safe Operating Area

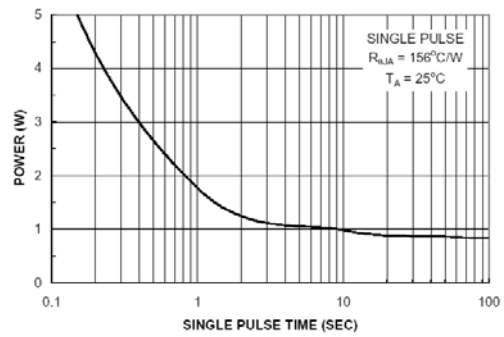


Figure 10. Single Pulse Maximum Power Dissipation

### Normalized Thermal Transient Junction to Ambient

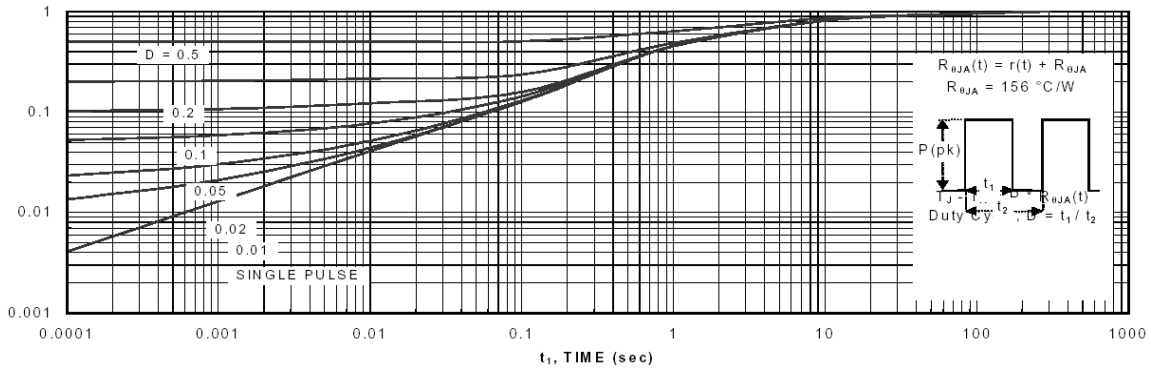
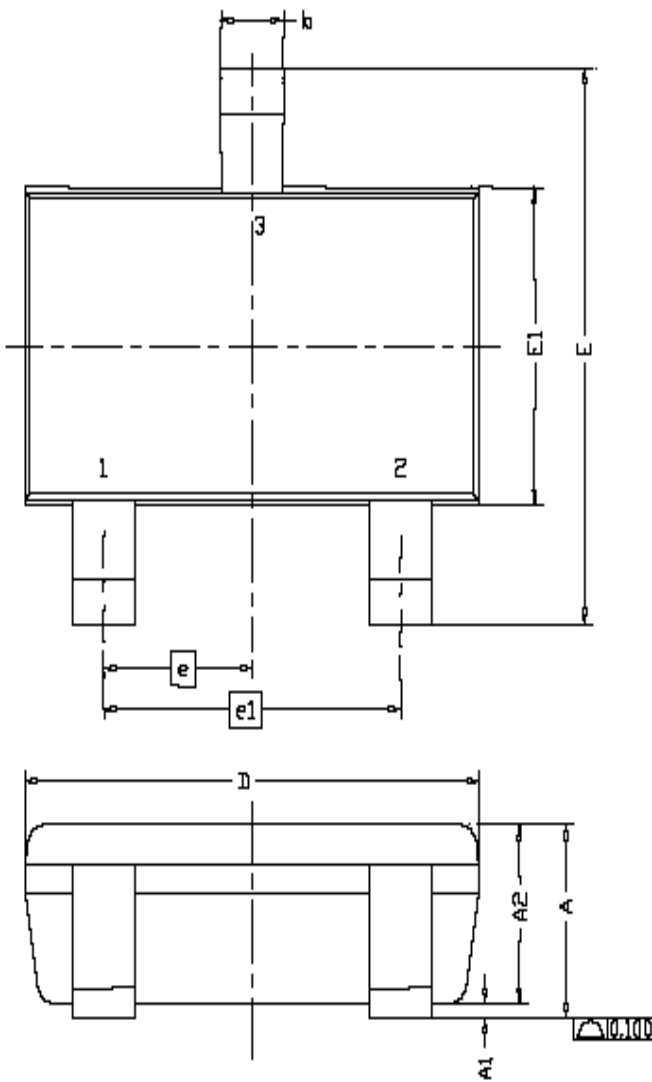
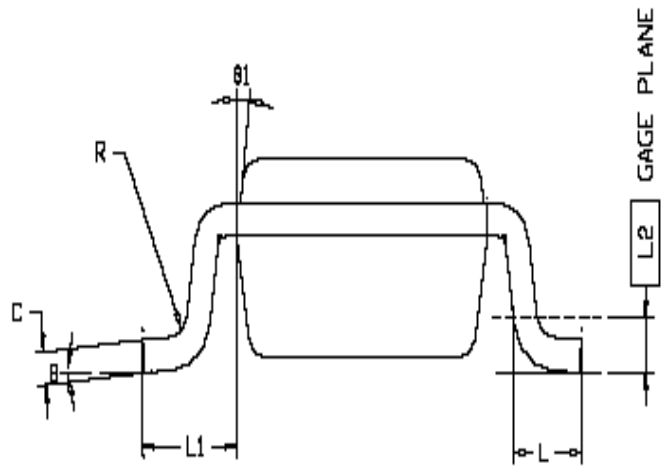


Figure 11. Transient Thermal Response Curve.

# 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°
$\theta_1$	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