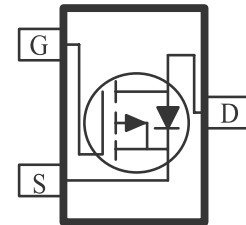
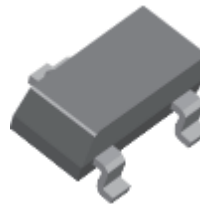


P-Channel 20-V (D-S) MOSFET

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
- Low gate charge 7.2nC

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (mΩ)	I_D (A)
-20	0.075 @ $V_{GS} = -4.5V$	-4.1
	0.10 @ $V_{GS} = -2.5V$	-3.2



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)				
Parameter		Symbol	Maximum	Units
Drain-Source Voltage		V_{DS}	-20	V
Gate-Source Voltage		V_{GS}	± 8	
Continuous Drain Current ^a	$T_A = 25^\circ\text{C}$	I_D	-4.1	A
	$T_A = 70^\circ\text{C}$		-3.3	
Pulsed Drain Current ^b		I_{DM}	-10	
Continuous Source Current (Diode Conduction) ^a		I_S	± 0.46	A
Power Dissipation ^a	$T_A = 25^\circ\text{C}$	P_D	1.25	W
	$T_A = 70^\circ\text{C}$		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 ^a	$t \leq 5 \text{ sec}$	R_{THJA}	100	$^\circ\text{C/W}$
	Steady-State		150	

Notes

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

SPECIFICATIONS (T _A = 25°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	-0.4			V
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±8 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			-10	
On-State Drain Current ^A	I _{D(on)}	V _{DS} = -5 V, V _{GS} = -4.5 V	-5			A
Drain-Source On-Resistance ^A	r _{DS(on)}	V _{GS} = -4.5 V, I _D = -4.1 A			79	mΩ
		V _{GS} = -2.5 V, I _D = -3.2 A			110	
Forward Tranconductance ^A	g _{fs}	V _{DS} = -5 V, I _D = -1.25 A		9		S
Diode Forward Voltage	V _{SD}	I _S = -0.46 A, V _{GS} = 0 V		-0.65		V
Dynamic ^b						
Total Gate Charge	Q _g	V _{DS} = -10 V, V _{GS} = -4.5 V, I _D = -4.1 A		7.2		nC
Gate-Source Charge	Q _{gs}			1.7		
Gate-Drain Charge	Q _{gd}			1.5		
Input Capacitance	C _{iss}	P-Channel V _{DS} =-15V, V _{GS} =0V, f=1MHz		520		pF
Output Capacitance	C _{oss}			130		
Reverse Transfer Capacitance	C _{rss}			70		
Turn-On Delay Time	t _{d(on)}	V _{DD} = -10 V, I _L = -1 A, V _{GEN} = -4.5 V, R _G = 6 Ω		10		ns
Rise Time	t _r			9		
Turn-Off Delay Time	t _{d(off)}			27		
Fall-Time	t _f			11		

Notes

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

Typical Electrical Characteristics

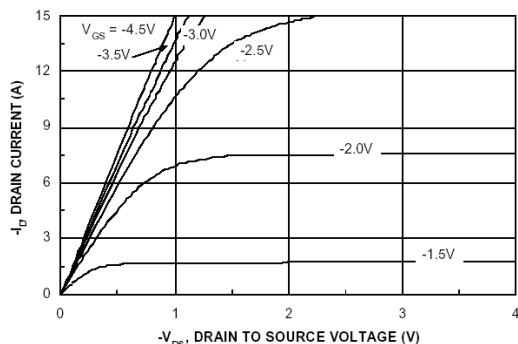


Figure 1. On-Region Characteristics

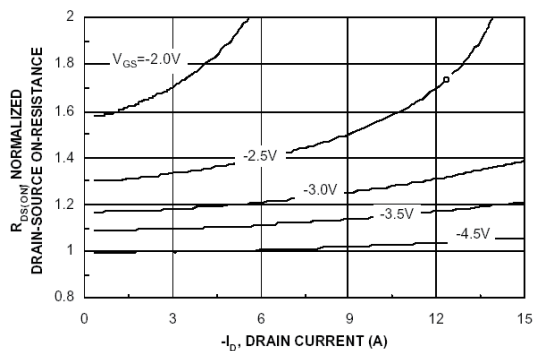


Figure 2. On-Resistance Variation with Drain Current and Gate Voltage

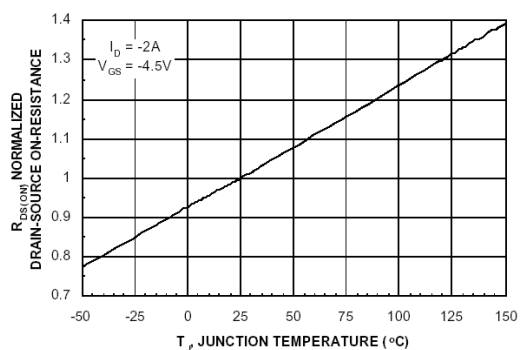


Figure 3. On-Resistance Variation with Temperature

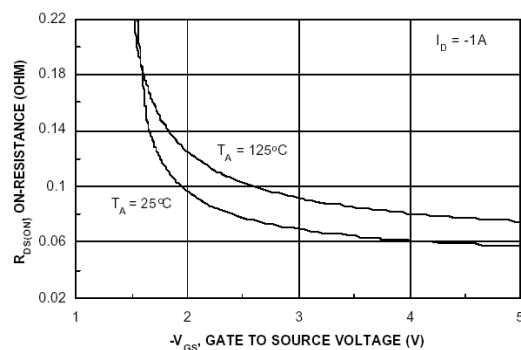


Figure 4. On-Resistance Variation with Gate to Source Voltage

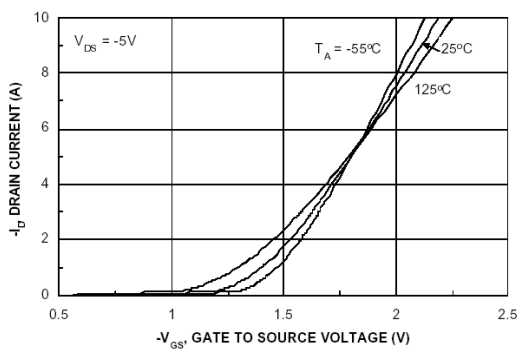


Figure 5. Transfer Characteristics

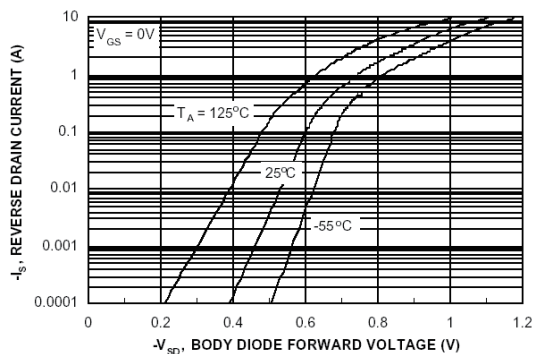


Figure 6. Body Diode Forward Voltage Variation with Source Current and Temperature

Typical Electrical Characteristics

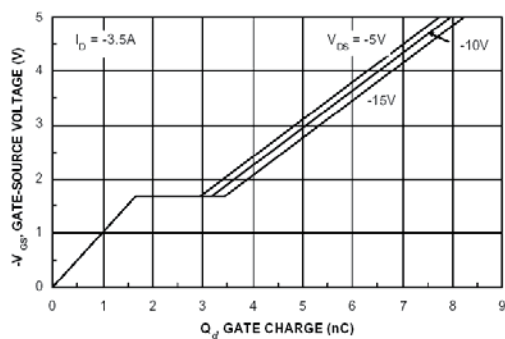


Figure 7. Gate Charge Characteristic

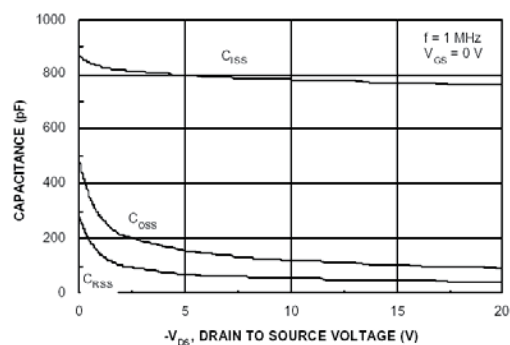


Figure 8. Capacitance Characteristic

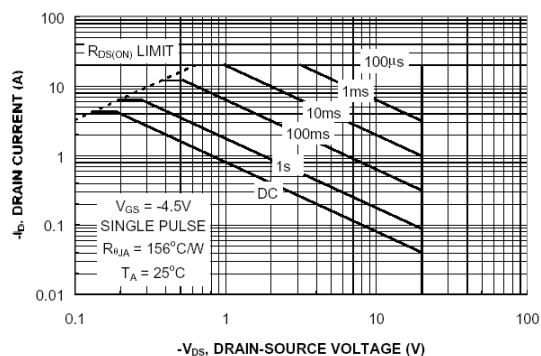


Figure 9. Maximum Safe Operating Area

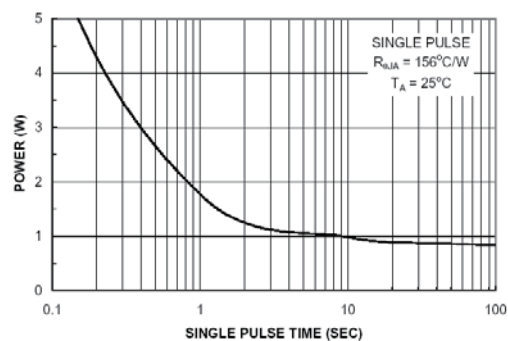


Figure 10. Single Pulse Maximum Power Dissipation

Normalized Thermal Transient Junction to Ambient

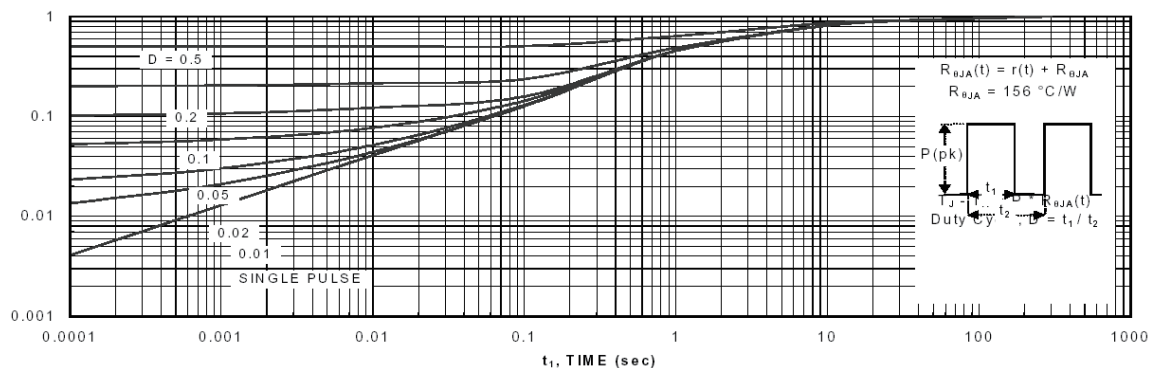
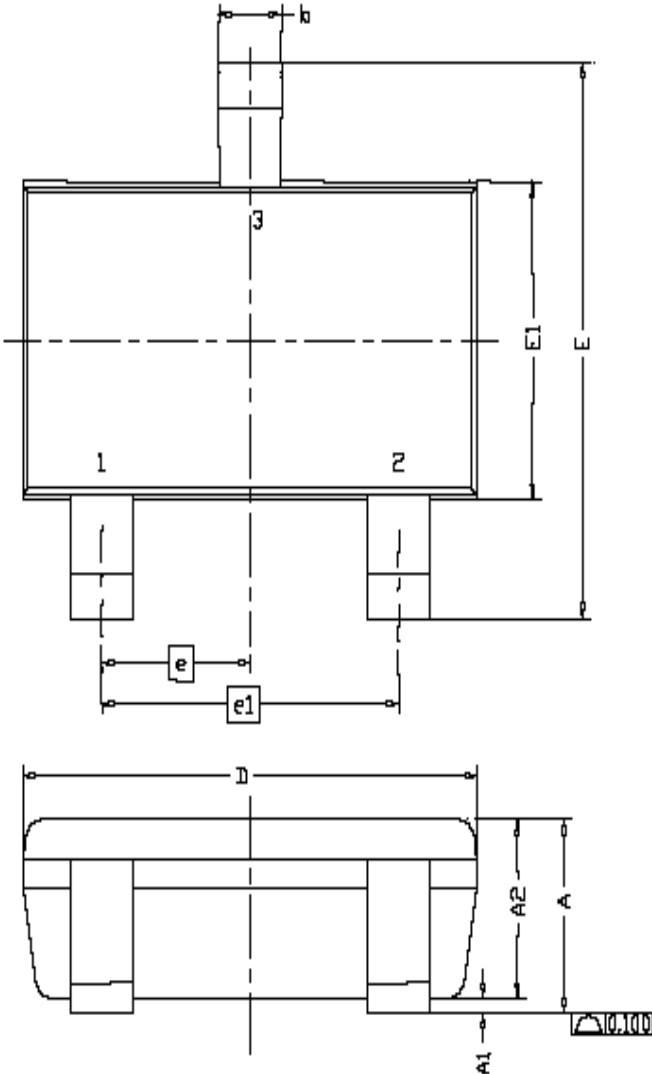
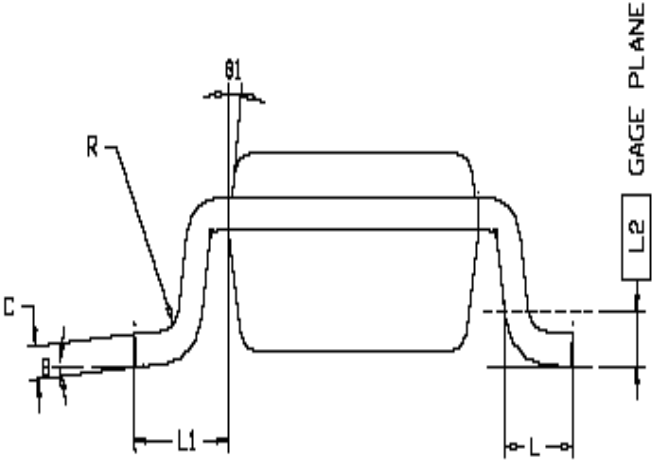


Figure 11. Transient Thermal Response Curve.

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	---	---
θ	0°	4°	8°
θ1	7°NOM		



Ordering information

- AM2321P-T1-XX
 - A: Analog Power
 - M: MOSFET
 - 2321: Part number
 - P: P-Channel
 - T1: Tape & reel
 - XX: Blank: Standard
PF: Leadfree