



DESCRIPTION

AM2317A is the P-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced trench technology devices are well suited for high efficiency fast switching applications, low in-line power loss are needed in small outline surface mount package.

The AM2317A is available in SOT-23S package.

FEATURES

- $V_{DS} = -20V$, $I_D = -4.2A$
 $R_{DS(ON)} = 38m\Omega(Typ.)@V_{GS} = -10V$
 $R_{DS(ON)} = 45m\Omega(Typ.)@V_{GS} = -4.5V$
 $R_{DS(ON)} = 60m\Omega(Typ.)@V_{GS} = -2.5V$
 $R_{DS(ON)} = 80m\Omega(Typ.)@V_{GS} = -1.8V$
- Fast switch
- 1.8V Low gate drive applications
- High power and current handling capability
- Available in SOT-23S Package

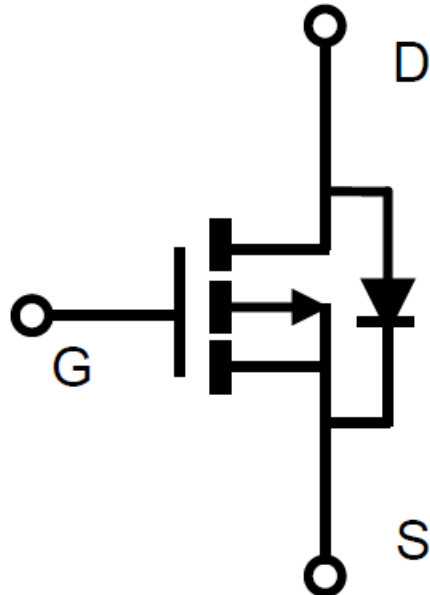
APPLICATIONS

- Hand-Held Instruments
- Load Switch

ORDERING INFORMATION

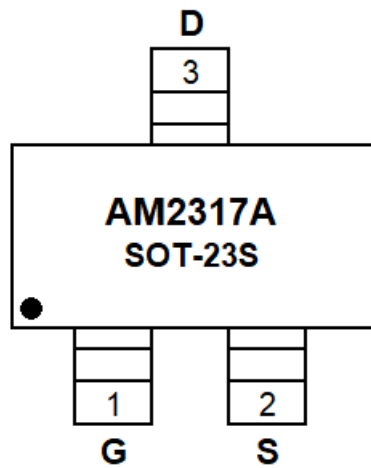
Package Type		Part Number	
SOT-23S SPQ: 3,000pcs/Reel	E3S	AM2317AE3SR	
		AM2317AE3SVR	
Note	V: Halogen free Package		
	R: Tape & Reel		
AiT provides all RoHS products			

TYPICAL APPLICATION





PIN DESCRIPTION



Top View

Pin #	Symbol	Function
1	G	Gate
2	S	Source
3	D	Drain



ABSOLUTE MAXIMUM RATINGS

T_A = 25°C, unless otherwise noted

V _{DSS} , Drain-Source Voltage		-20V
V _{GSS} , Gate-Source Voltage		±12V
I _D , Continuous Drain Current	T _A = 25°C	-4.2A
	T _A = 70°C	-3.3A
I _{DM} , Pulsed Drain Current ^{NOTE1}		-16.8A
P _D , Power Dissipation ^{NOTE2}	T _A = 25°C	1.4W
	T _A = 70°C	0.9W
T _J , Operation Junction Temperature		-55°C ~ +150°C
T _{STG} , Storage Temperature Range		-55°C ~ +150°C

Stress beyond above listed "Absolute Maximum Ratings" may lead permanent damage to the device. These are stress ratings only and operations of the device at these or any other conditions beyond those indicated in the operational sections of the specifications are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

THERMAL RESISTANCE

Parameter		Symbol	Min	Typ	Max	Units
Thermal Resistance Junction to Ambient ^{NOTE3}	t ≤ 10s	R _{θJA}	-	-	90	°C/W
Thermal Resistance Junction to Ambient ^{NOTE3}	Steady-State		-	-	120	



ELECTRICAL CHARACTERISTICS

T_A = 25°C, unless otherwise noted

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _{DS} =-250μA	-20	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _{DS} =-250μA	-0.5	-0.7	-1	V
Gate Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±12V	-	-	±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-20V, V _{GS} =0V, T _J =25°C	-	-	-1	μA
		V _{DS} =-16V, V _{GS} =0V, T _J =75°C	-	-	-10	
Drain-source On-Resistance ^{NOTE4}	R _{DS(ON)}	V _{GS} =-10V, I _{DS} =-4.5A	-	38	43	mΩ
		V _{GS} =-4.5V, I _{DS} =-4.2A	-	45	50	
		V _{GS} =-2.5V, I _{DS} =-2.5A	-	60	68	
		V _{GS} =-1.8V, I _{DS} =-2A	-	80	95	
Forward Transconductance	G _{fs}	V _{DS} =-10V, I _D =-3A	-	5.5	-	S
Diode Characteristics						
Diode Forward Voltage ^{NOTE2}	V _{SD}	I _S =-1A, V _{GS} =0V	-	-0.7	-1	V
Continuous Source Current	I _S		-	-	-2.1	A
Dynamic and Switching Parameters						
Total Gate Charge	Q _g	V _{DS} =-10V, V _{GS} =-4.5V, I _{DS} =-4.2A	-	7.6	10.6	nC
Gate-Source Charge	Q _{gs}		-	1.62	2.3	
Gate-Drain Charge	Q _{gd}		-	1.2	1.7	
Input Capacitance	C _{iss}	V _{DS} =-10V, V _{GS} =0V, f=1MHz	-	680	-	pF
Output Capacitance	C _{oss}		-	76	-	
Reverse Transfer Capacitance	C _{rss}		-	45	-	
Turn-On Time ^{NOTE5}	t _{d(on)}	V _{DD} =-10V, V _{GEN} =-4.5V, R _G =6Ω, I _D =-1A,	-	6	11	ns
	t _r		-	8.7	17	
Turn-Off Time ^{NOTE5}	t _{d(off)}		-	38	72	
	t _f		-	11	21	

NOTE1: Pulsed width limited by maximum junction temperature, T_{J(MAX)}=150°C.

NOTE2: The value of R_{θJA} is measured with the device mounted on 1in2 FR-4 board in a still air environment with maximum junction temperature T_{J(MAX)}=150°C (initial temperature T_A=25°C).

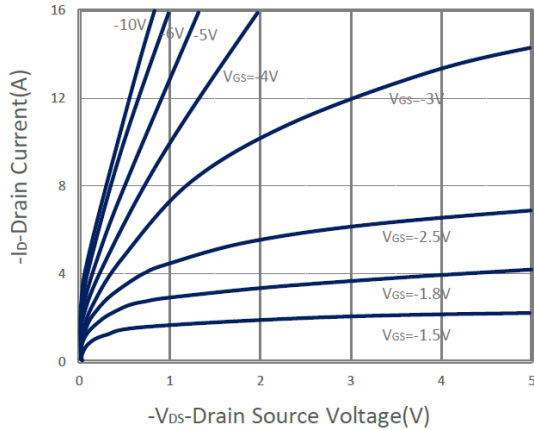
NOTE3: T_{J(MAX)}=150°C, using junction-to-case thermal resistance (R_{θJC}) is more useful in additional heat sinking is used.

NOTE4: The data tested by pulsed, pulse width ≤ 300μs, duty cycle ≤ 2%.

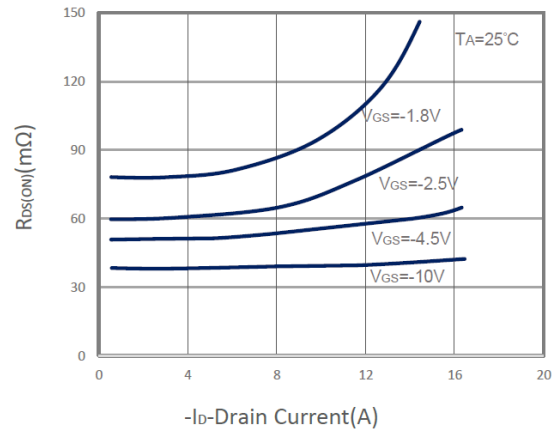


TYPICAL ELECTRICAL CHARACTERISTICS

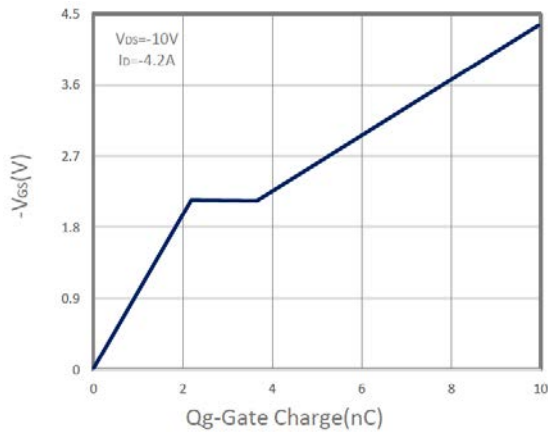
1. Output Characteristics



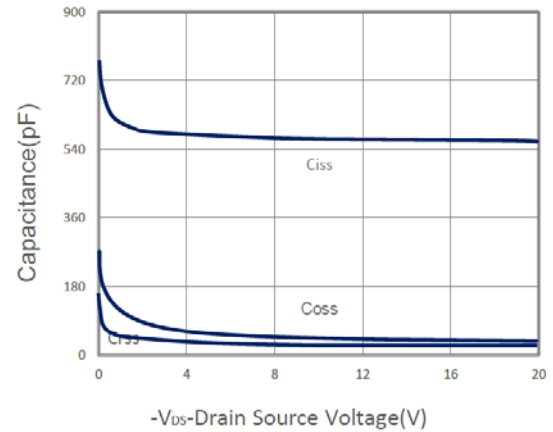
2. Drain-Source On Resistance



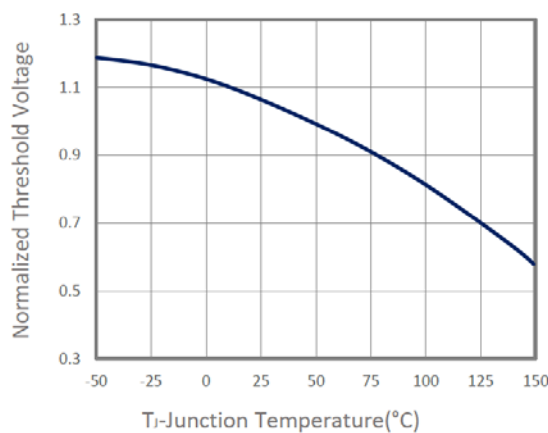
3. Gate Charge



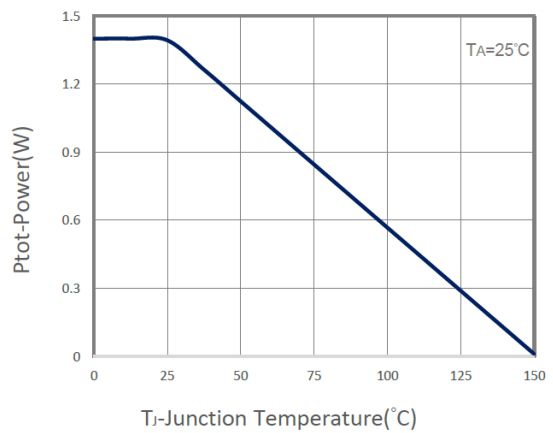
4. Capacitance



5. Gate Threshold Voltage

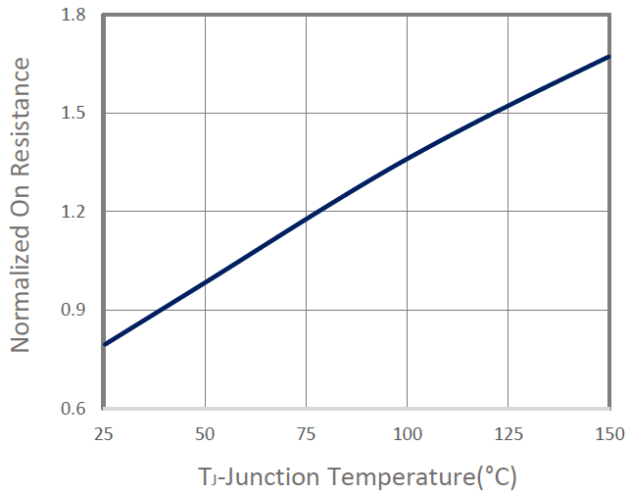


6. Power Dissipation

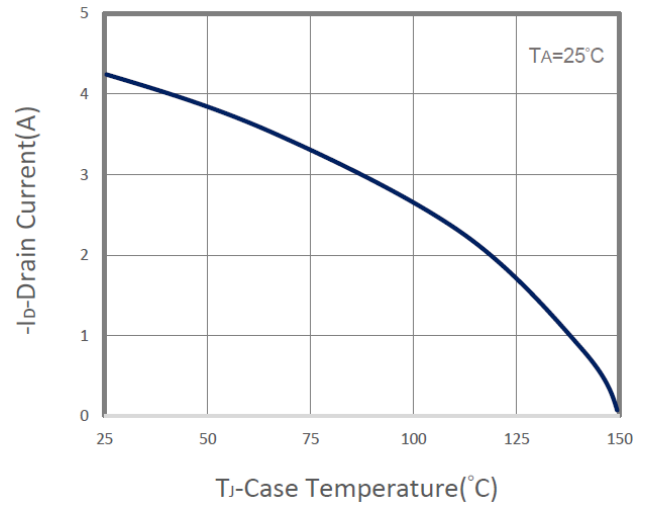




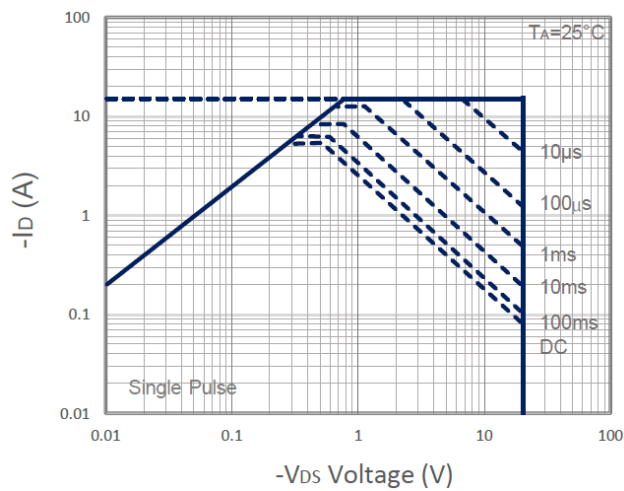
7. $R_{DS(ON)}$ vs. Junction Temperature



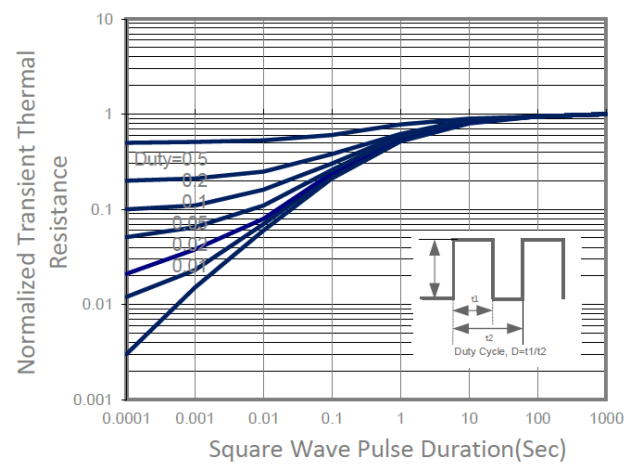
8. Drain Current vs. T_J



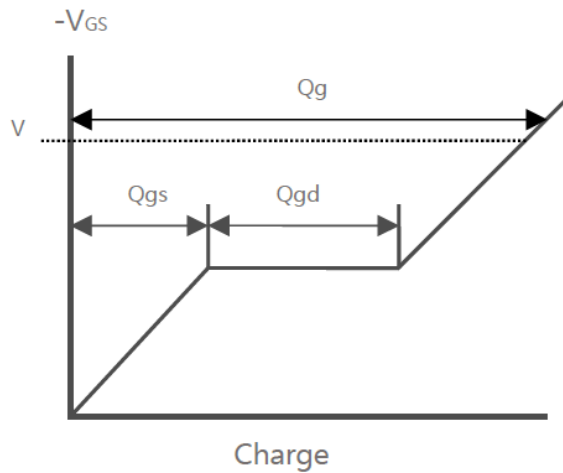
9. Maximum Safe Operation Area



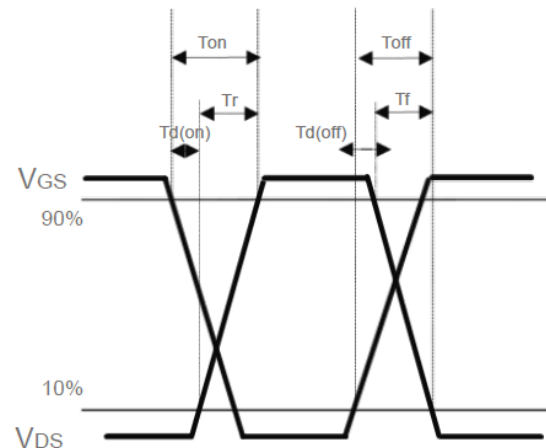
10. Thermal Transient Impedance



11. Gate Chrg Waveform



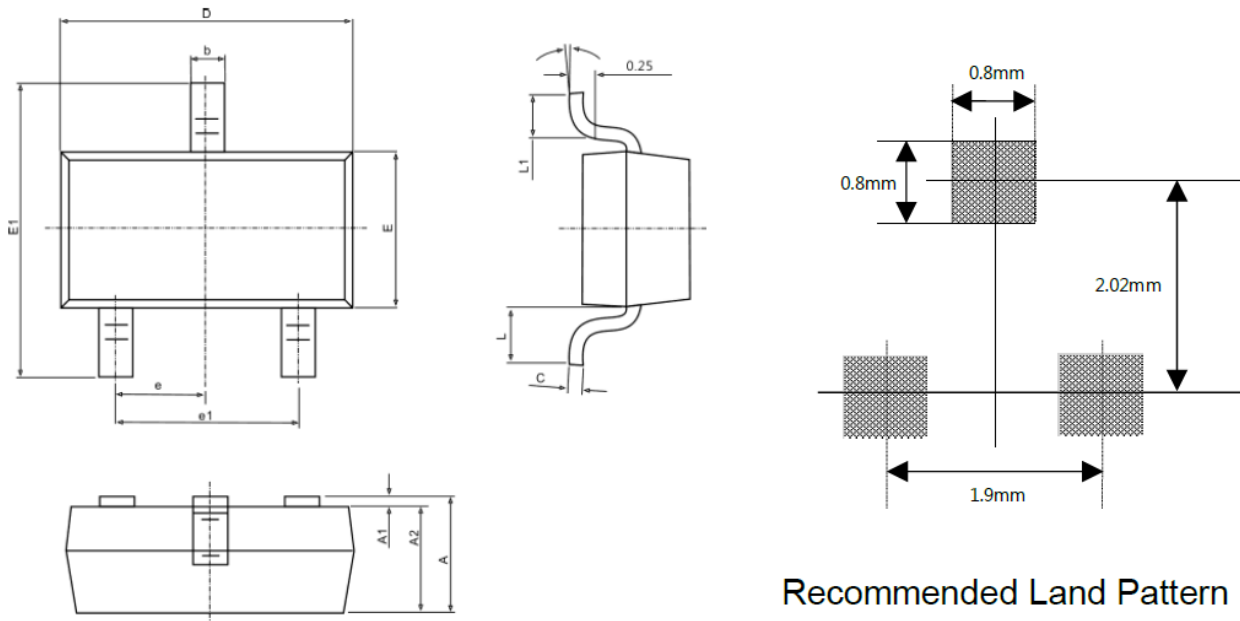
12. Switching Time Waveform





PACKAGE INFORMATION

Dimension in SOT-23S Package (Unit: mm)



Recommended Land Pattern

Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°



IMPORTANT NOTICE

AiT Semiconductor Inc. (AiT) reserves the right to make changes to any its product, specifications, to discontinue any integrated circuit product or service without notice, and advises its customers to obtain the latest version of relevant information to verify, before placing orders, that the information being relied on is current.

AiT Semiconductor Inc.'s integrated circuit products are not designed, intended, authorized, or warranted to be suitable for use in life support applications, devices or systems or other critical applications. Use of AiT products in such applications is understood to be fully at the risk of the customer. As used herein may involve potential risks of death, personal injury, or server property, or environmental damage. In order to minimize risks associated with the customer's applications, the customer should provide adequate design and operating safeguards.

AiT Semiconductor Inc. assumes to no liability to customer product design or application support. AiT warrants the performance of its products of the specifications applicable at the time of sale.