DESCRIPTION

V_{DS}=-20V

V_{GS}=±12V

ID(A)=-3.2A

$R_{DS(ON)}$=75mΩ(Typ.)@V_{GS}=-4.5V

$R_{DS(ON)}$=105mΩ(Typ.)@V_{GS}=-2.5V

$R_{DS(ON)}$=140mΩ(Typ.)@V_{GS}=-1.8V

The AM3413A is available in SOT-23S package.

FEATURES

- Fast switch
- 1.8V Low gate drive applications
- Available in SOT-23S package

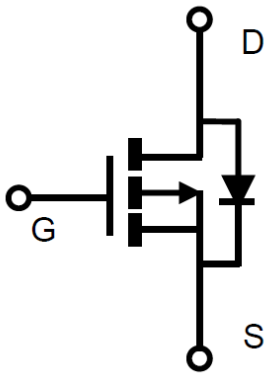
ORDERING INFORMATION

Package Type	Part Number	
SOT-23S SPQ: 3,000pcs/Reel	E3S	AM3413AE3SR
		AM3413AE3SVR
Note	V: Halogen free Package R: Tape & Reel	
AiT provides all RoHS free products		

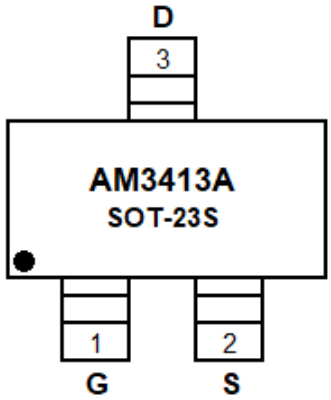
APPLICATIONS

- Portable instruments
- Load Switch

P CHANNEL MOSFET



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	-3.2A
	T_A=70°C	-2.6A
I_{DM}, Pulsed Drain Current[NOTE1]		12.8A
P_D, Power Dissipation[NOTE2]	T_A=25°C	1.3W
	T_A=70°C	0.8W
T_J, Operation Junction Temperature		-55℃ ~ 150℃
T_{STG}, Storage Temperature Range		-55℃ ~ 150℃

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	Typ.	Max.	Unit
Thermal Resistance Junction to Ambient[NOTE2]	t≦10s	$R_{\theta JA}$	-	95	℃/W
Thermal Resistance Junction to Ambient[NOTE2,3]	Steady-State		-	130	

ELECTRICAL CHARACTERISTICS

T_A = 25°C, unless otherwise noted

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Parameters						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=-250μA	-20	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250μA	-0.4	-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	$R_{DS(ON)}$	V_{GS}=-4.5V, I_D=-3.2A	-	75	85	mΩ
		V_{GS}=-2.5V, I_D=-2.6A	-	105	130	
		V_{GS}=-1.8V, I_D=-2A	-	140	180	
Forward Transconductance	G_{fs}	V_{DS}=-5V, I_D=-3A	-	8	-	S
Diode Characteristics						
Diode Forward Voltage	V_{SD}	I_S=-1A, V_{GS}=0V	-	-	-1	V
Continuous Source Current	I_S		-	-	-3.2	A
Reverse Recovery Time	t_{rr}	I_S=-3A, dI/dt=100A/μs,	-	8.1	-	ns
Reverse Recovery Charge	Q_{rr}	T_J=25°C	-	3.2	-	nC
Dynamic and Switching Parameters						
Total Gate Charge	Q_g	V_{DS}=-10V, V_{GS}=-4.5V I_D=-3.2A	-	9.5	13.3	nC
Gate-Source Charge	Q_{gs}		-	2.1	2.9	
Gate-Drain Charge	Q_{gd}		-	2.4	3.4	
Input Capacitance	C_{iss}	V_{DS}=-10V, V_{GS}=0V f=1MHz	-	675	-	pF
Output Capacitance	C_{oss}		-	85	-	
Reverse Transfer Capacitance	C_{rss}		-	66	-	
Turn-On Time	$t_{d(on)}$	V_{DD}=-10V, V_{GEN}=-4.5V, R_G=3Ω, I_D=-3A	-	4.8	9	ns
	t_r		-	16	30	
Turn-Off Time	$t_{d(off)}$		-	20	38	
	t_f		-	9	17	

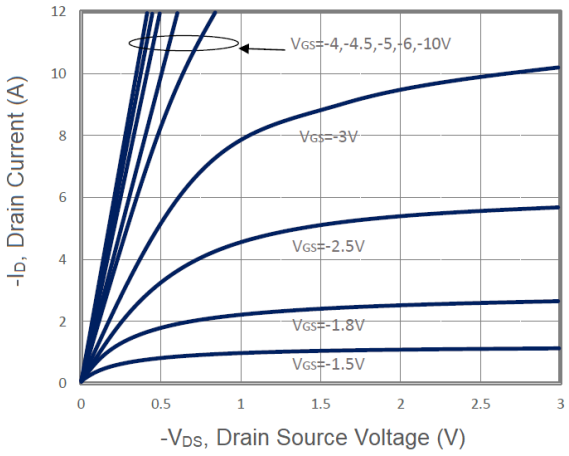
NOTE1: Pulsed width limited by maximum junction temperature, $T_{J(MAX)}$=150°C.

NOTE2: The value of $R_{\theta JA}$ 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).

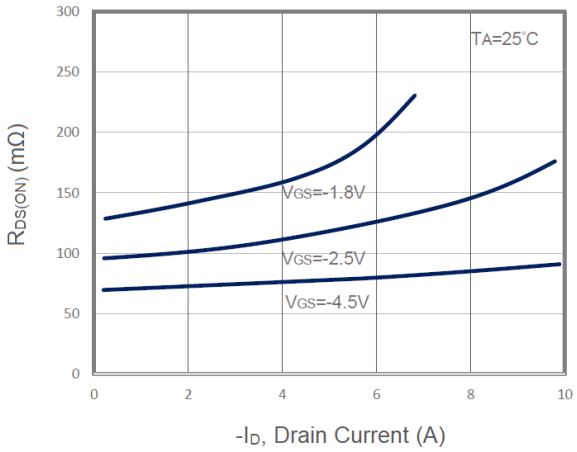
NOTE3: $T_{J(MAX)}$=150°C, using junction-to-case thermal resistance ($R_{\theta JC}$) is more useful in additional heat sinking is used.

TYPICAL CHARACTERISTICS

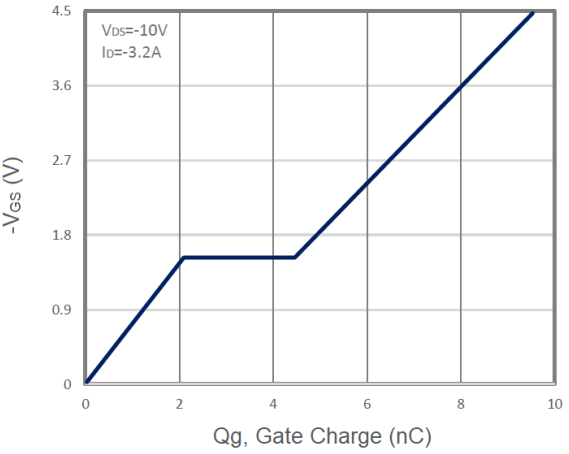
1. Output Characteristics



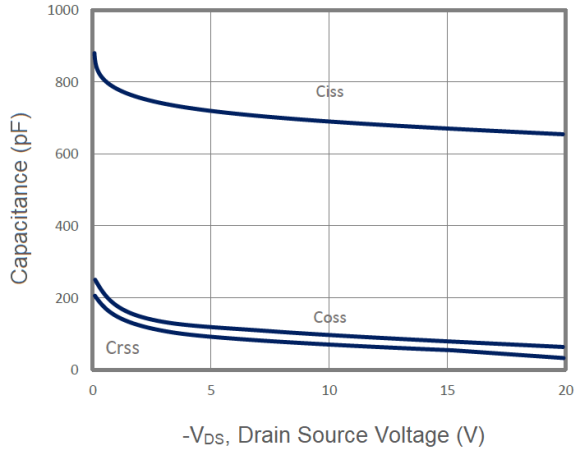
2. Drain-Source On Resistance



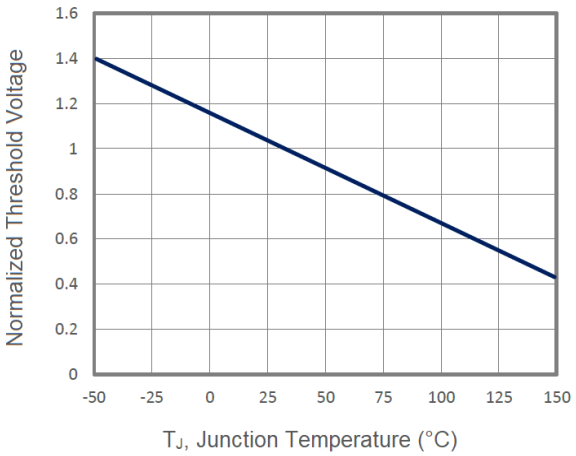
3. Gate Charge



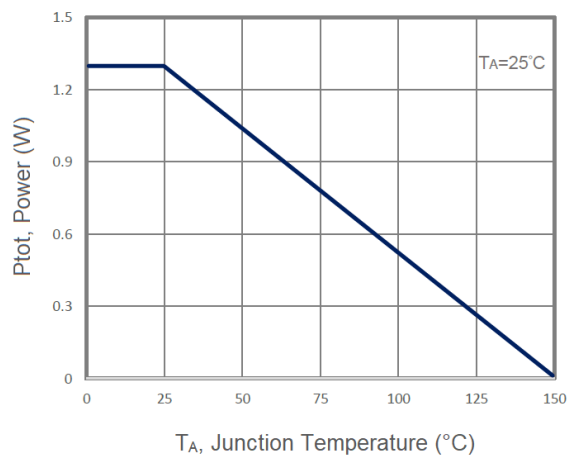
4. Capacitance



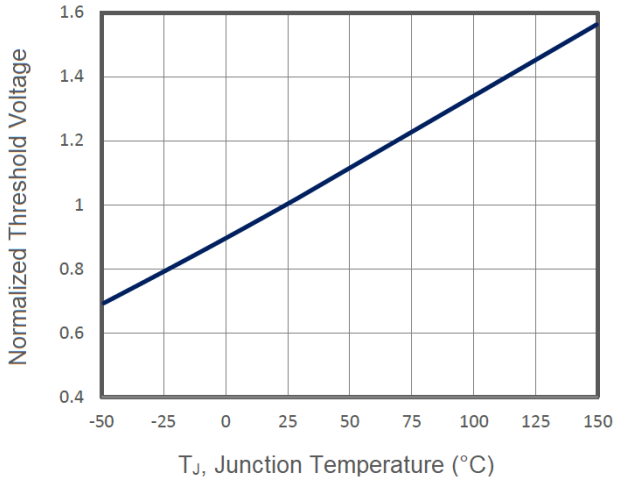
5. Gate Threshold Voltage



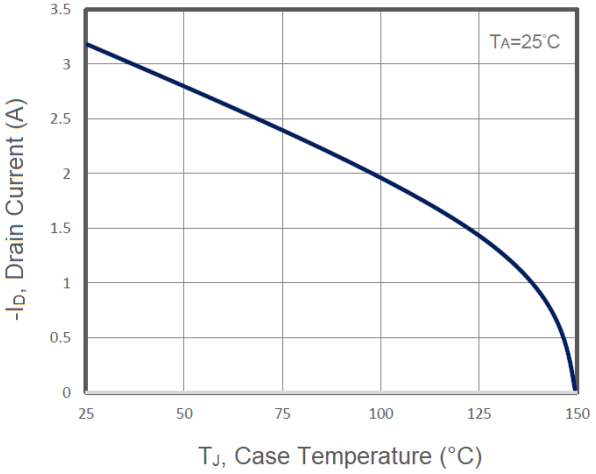
6. Power Dissipation



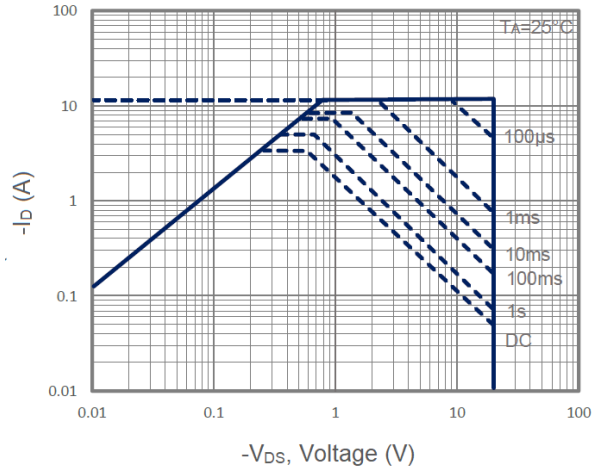
7. Gate Threshold Voltage



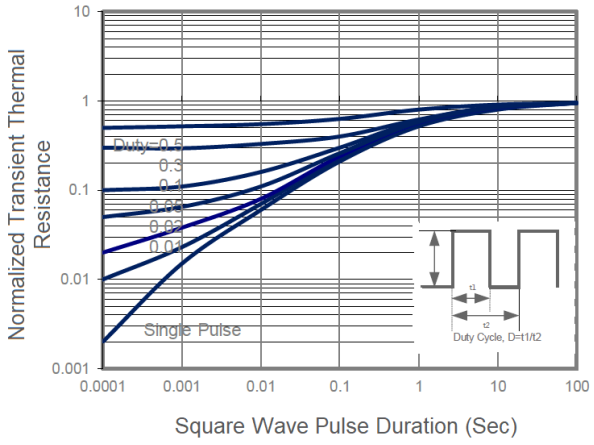
8. Drain Current vs. T_J



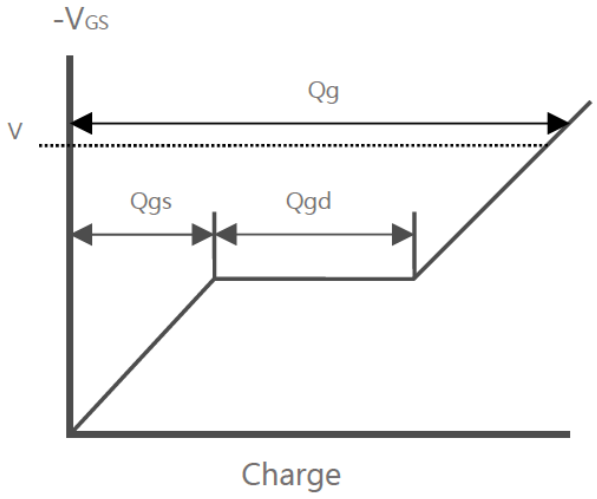
9. Maximum Safe Operation Area



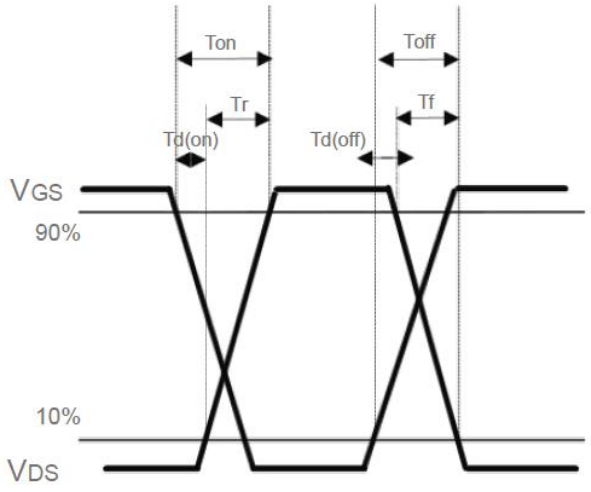
10. Thermal Transient Impedance



11. Gate Charge Waveform

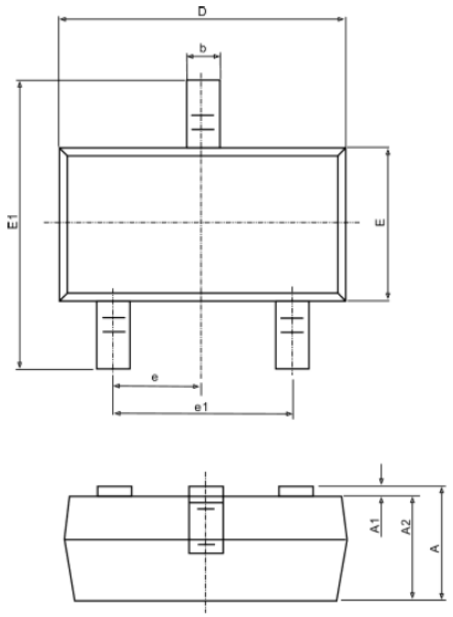


12. Switching Time Waveform

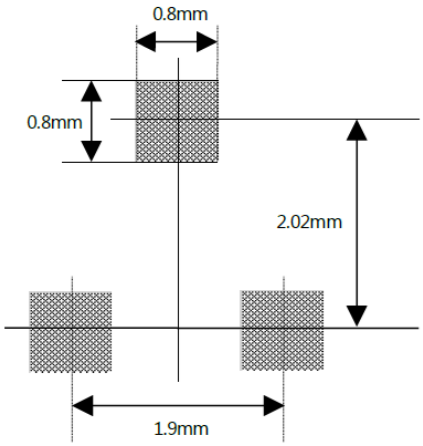


PACKAGE INFORMATION

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°

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