



DESCRIPTION

The AM3415A uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 1.8V. This device is suitable for use as a load switch or in PWM applications. It is ESD protected.

The AM3415A is available in SOT-23 package.

ORDERING INFORMATION

Package Type	Part Number	
SOT-23	E3	AM3415AE3R
		AM3415AE3VR
Note	V: Halogen free Package R: Tape & Reel	
AiT provides all RoHS products Suffix " V " means Halogen free Package		

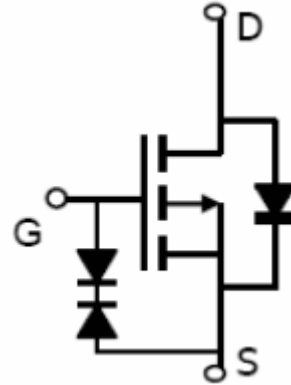
FEATURES

- $V_{DS} = -20V, I_D = -4A$
 $R_{DS(ON)} < 60m\Omega @ V_{GS} = -2.5V$
 $R_{DS(ON)} < 47m\Omega @ V_{GS} = -4.5V$
ESD Rating: 2500V HBM
- High Power and current handing capability
- Lead free product is acquired
- Surface mount package
- Available in SOT-23 Package

APPLICATION

- PWM application
- Load switch

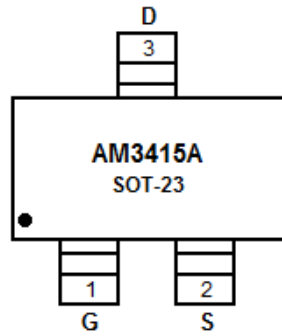
TYPICAL APPLICATION



Schematic diagram



PIN DESCRIPTION



Top View

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



ABSOLUTE MAXIMUM RATINGS

$T_A=25^{\circ}\text{C}$ unless otherwise noted

V_{DS} , Drain-Source Voltage	-20V
V_{GS} , Gate-Source Voltage	$\pm 10\text{V}$
I_D , Drain Current-Continuous	-4A
I_{DM} , Drain Current-Pulsed ^{NOTE1}	-30A
P_D , Maximum Power Dissipation	1.4W
T_J, T_{STG} , Operating Junction and Storage Temperature Range	$-55^{\circ}\text{C} \sim 150^{\circ}\text{C}$

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.

NOTE1: Repetitive Rating: Pulse width limited by maximum junction temperature.

THERMAL CHARACTERISTIC

Parameter	Symbol	MIN	MAX	Units
Thermal Resistance, Junction-to-Ambient ^{NOTE2}	$R_{\theta JA}$		89.3	$^{\circ}\text{C}/\text{W}$

NOTE2: Surface Mounted on FR4 Board, $t \leq 10$ sec.



ELECTRICAL CHARACTERISTICS

T_A=25°C, unless otherwise noted

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown	BV _{DSS}	V _{GS} =0V, I _D =-250μA	-20	-	-	V
Zero Gate Voltage Drain	I _{DSS}	V _{DS} =-20V, V _{GS} =0V	-	-	1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±10V, V _{DS} =0V	-	-	±10	μA
On Characteristics NOTE3						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-0.4	-0.65	-1.0	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =-4.5V, I _D =-4A	-	34.	47	mΩ
		V _{GS} =-2.5V, I _D =-4A	-	44	60	
Forward Transconductance	g _{FS}	V _{DS} =-5V, I _D =-4A	8	-	-	S
Dynamic Characteristics NOTE4						
Input Capacitance	C _{ISS}	V _{DS} =-10V, V _{GS} =0V, F=1.0MHz	-	950	-	PF
Output Capacitance	C _{OSS}		-	165	-	
Reverse Transfer Capacitance	C _{RSS}		-	120	-	
Switching Characteristics NOTE4						
Turn-on Delay Time	t _{D(ON)}	V _{DD} =-10V, R _L =2.5Ω V _{GS} =-4.5V, R _{GEN} =3Ω	-	12	-	nS
Turn-on Rise Time	t _R		-	10	-	
Turn-Off Delay Time	t _{D(OFF)}		-	19	-	
Turn-Off Fall Time	t _F		-	25	-	
Total Gate Charge	Q _G	V _{DS} =-10V, I _D =-4A, V _{GS} =-4.5V	-	12	-	nC
Gate-Source Charge	Q _{GS}		-	1.4	-	
Gate-Drain Charge	Q _{GD}		-	3.6	-	
Drain-Source Diode						
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =-1A	-	-	-1.2	V
Diode Forward Current	I _S		-	-	-2.2	A

NOTE2: Surface Mounted on FR4 Board, t ≤ 10 sec.

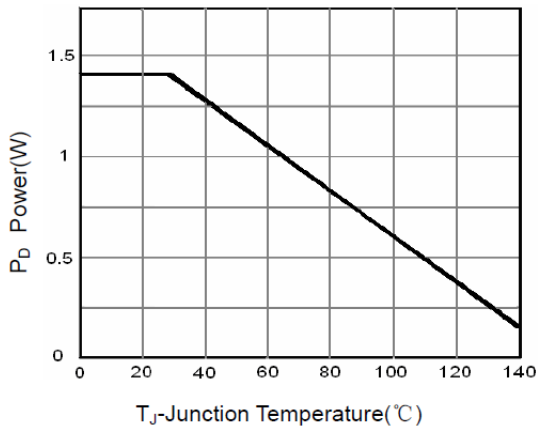
NOTE3: Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

NOTE4: Guaranteed by design, not subject to production

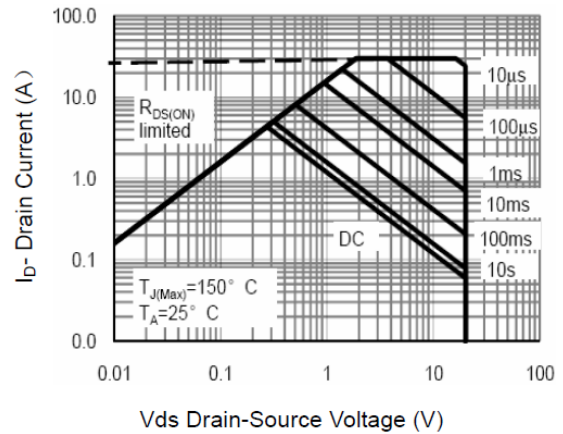


TYPICAL PERFORMANCE CHARACTERISTICS

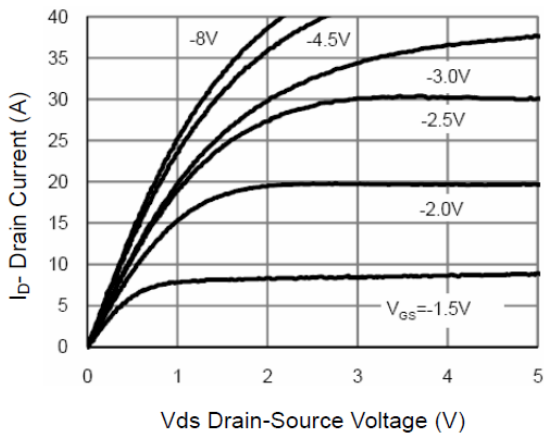
1. Power Dissipation



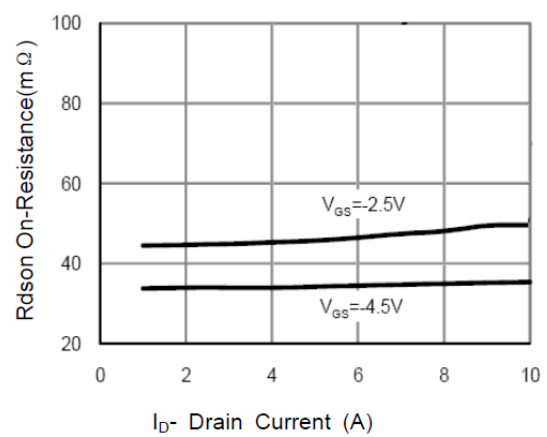
2. Safe Operation Area



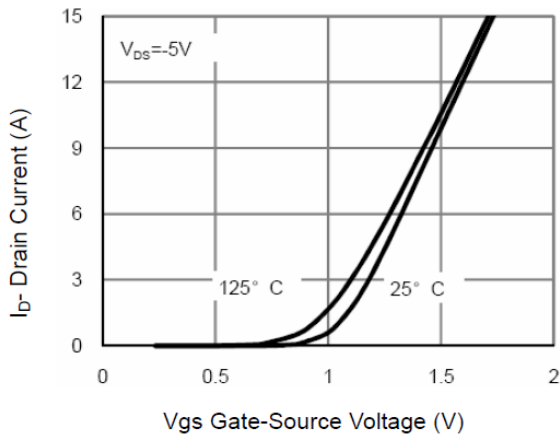
3. Output CHARACTERISTICS



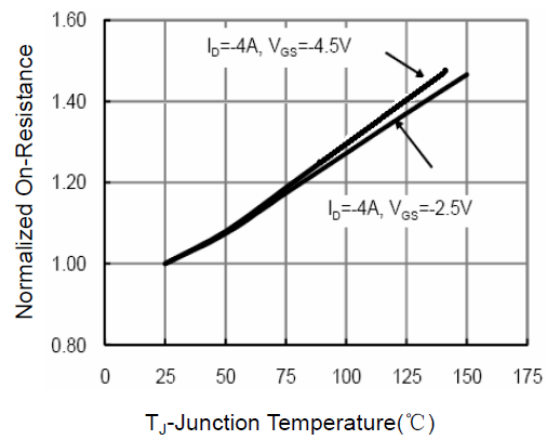
4. Drain-Source On-Resistance



5. Transfer Characteristics

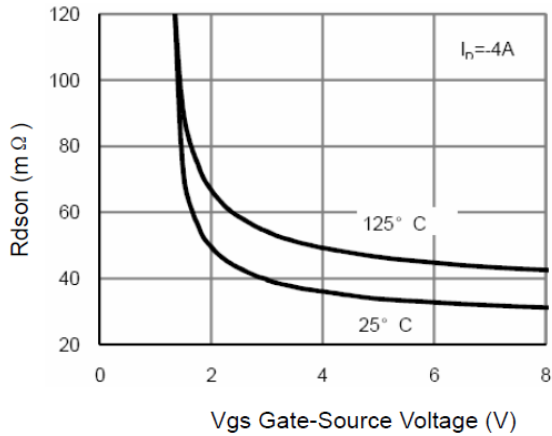


6. Drain-Source On-Resistance

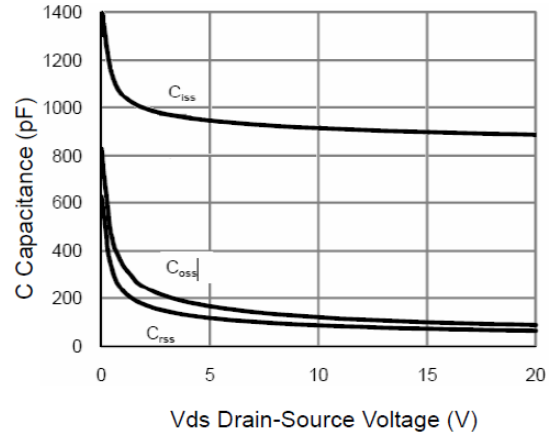




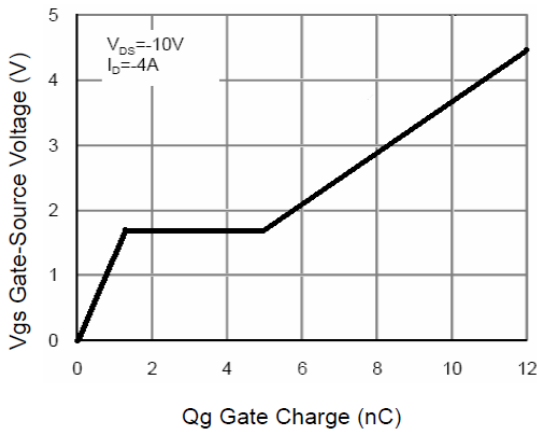
7. $R_{DS(on)}$ vs. V_{GS}



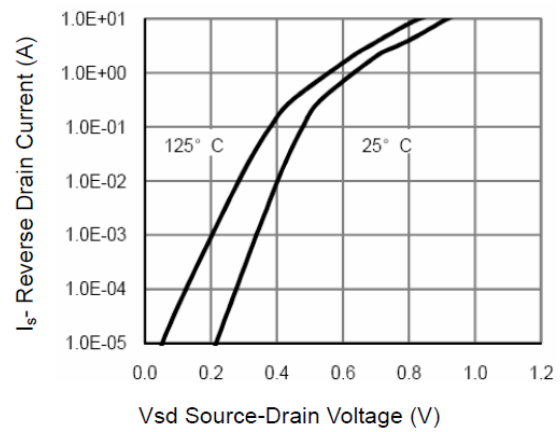
8. Capacitance vs. V_{DS}



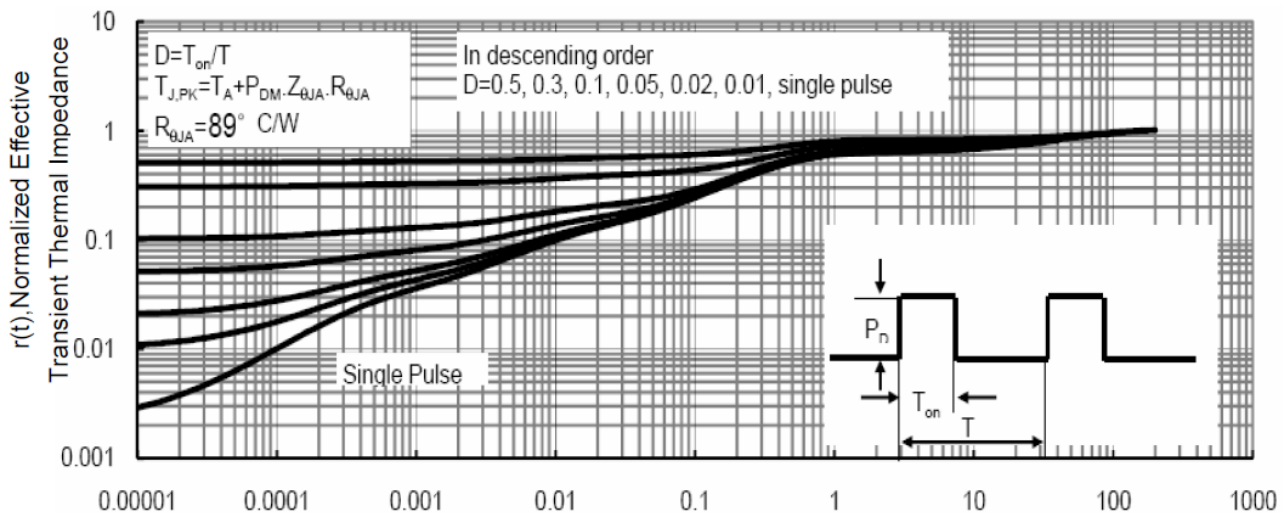
9. Gate Charge



10. Source- Drain Diode Forward



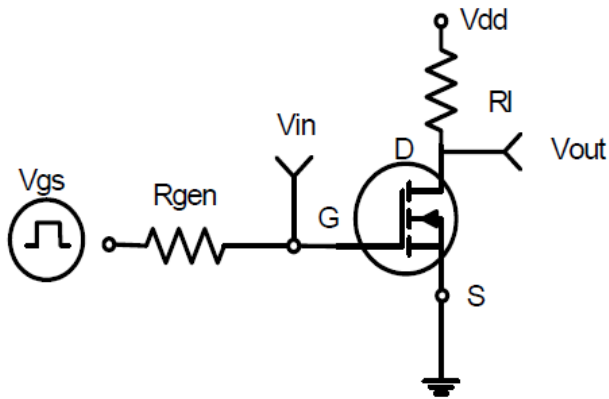
11. Normalized Maximum Transient Thermal Impedance



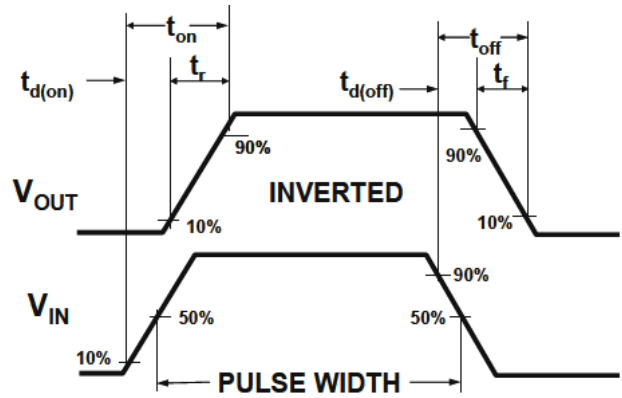


DETAILED INFORMATION

Switching Test Circuit



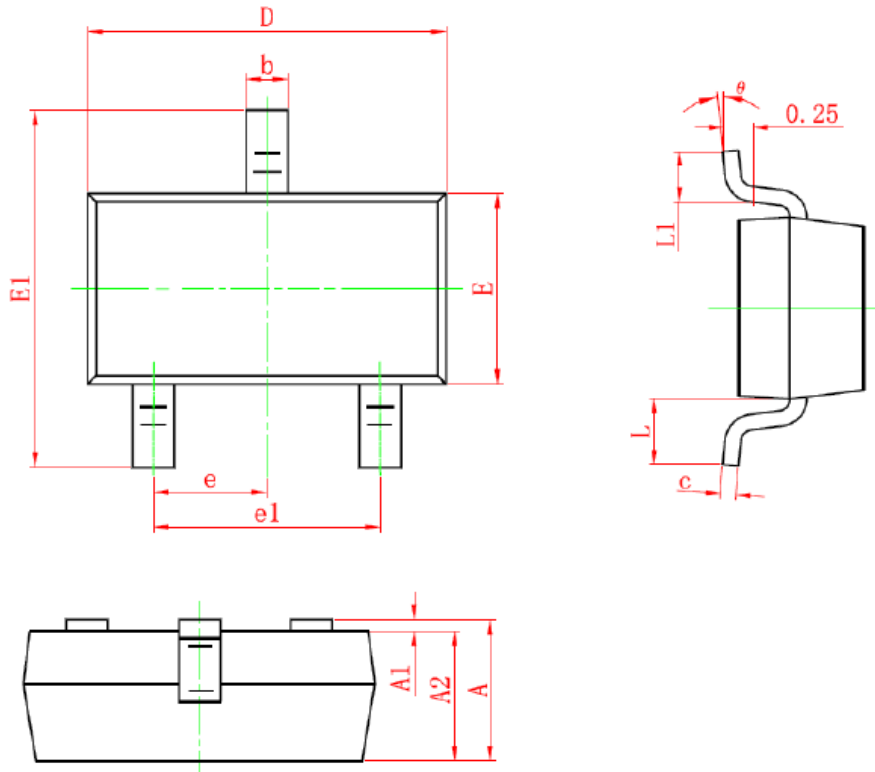
Switching Waveforms





PACKAGE INFORMATION

Dimension in SOT-23 Package (Unit: mm)



SYMBOL	MIN	MAX
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950(BSC)	
e1	1.800	2.000
L	0.300	0.500
θ	0°	8°



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