DESCRIPTION

The AM3415 is the P-Channel logic enhancement mode power field effect transistor is produced using high cell density. Advanced trench technology to provide excellent $R_{DS(ON)}$ low gate charge and operation with gate voltage as 1.5V.

This device is suitable for use as a load switch or in applications.

The AM3415 is available in SOT-23 Package

ORDERING INFORMATION

Package Type	Part Number	
SOT-23	E3	AM3415E3R
		AM3415E3VR
Note	V: Halogen free Package R : Tape & Reel	
AiT provides all RoHS products Suffix " V " means Halogen free Package		

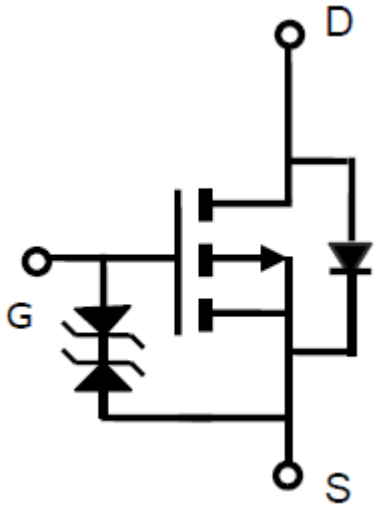
FEATURES

- -20V/-4.0A, $R_{DS(ON)}$ =45mΩ(typ.)@V_{GS} =-4.5V
- -20V/-4.0A, $R_{DS(ON)}$ =54mΩ(typ.)@V_{GS} =-2.5V
- -20V/-2.0A, $R_{DS(ON)}$ =68mΩ(typ.)@V_{GS} =-1.8V
- -20V/-1.0A, $R_{DS(ON)}$ =92mΩ(typ.)@V_{GS} =-1.5V
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and Maximum DC current capability
- ESD Protected : 3kV
- Available in SOT-23 package

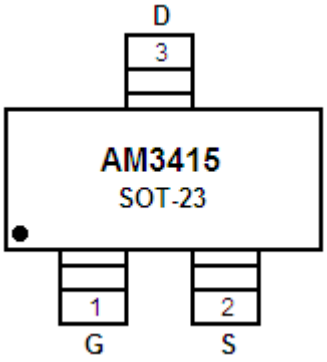
APPLICATIONS

- Cellular/Portable
- 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		-20 V
V_{GSS}, Gate-Source Voltage		±8 V
I_D, Continuous Drain Current (V_{GS}=-8V)	T_A=25°C NOTE1	-4.0 A
	T_A=70°C NOTE1	-3.5 A
I_{DM}, Pulsed Drain Current NOTE2		-20 A
P_D, Power Dissipation	T_A=25°C	1.5 W
	T_A=70°C	0.9 W
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.

NOTE1: The value of $R_{\theta JA}$ is measured with the device mounted on 1in 2 FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C.

NOTE2: The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%

THERMAL INFORMATION

Parameter	Symbol	Typ.	Max.	Units
Thermal Resistance-Junction to Ambient Steady-State	$R_{\theta JA}$	-	140	°C/W
Thermal Resistance Junction to Lead Steady-State	$R_{\theta JL}$	-	80	°C/W

ELECTRICAL CHARACTERISTICS

T_J = 25℃, unless otherwise specified

Parameter	Symbol	Conditions	Min	Type	Max	Units
Static Parameters						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,I_D=-250μA	-20	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250μA	-0.3	-	-1.0	V
Gate Leakage Current	I_{GSS}	V_{DS}=0V,V_{GS}=±8V	-	-	±10	μA
Zero Gate Voltage, Drain-Source Leakage Current	I_{DSS}	V_{DS}=-20V,V_{GS}=0V T_J=25°C	-	-	-1	μA
		V_{DS}=-20V,V_{GS}=0V T_J=55°C			-5	
Drain-source On-Resistance[NOTE2]	$R_{DS(ON)}$)	V_{GS}=-4.5V,I_D=-4.0A	-	44	54	mΩ
		V_{GS}=-2.5V,I_D=-4.0A		53	62	
		V_{GS}=-1.8V,I_D=-2.0A		66	75	
		V_{GS}=-1.5V,I_D=-1.0A		85	110	
Forward Transconductance	g_{fs}	V_{DS}=-5V,I_D=-4.0A	-	22	-	S
Source-Drain Diode						
Diode Forward Voltage	V_{SD}	I_S=-1.0A,V_{GS}=0V	-	-0.67	-1.0	V
Continuous Source Current[NOTE1,3]	I_S		-	-	-6	A
Dynamic Parameters						
Total Gate Charge	Q_g (-4.5V)	V_{DS}=-10V	-	11.1	-	nC
Gate-Source Charge	Q_{gs}	V_{GS}=-4.5V	-	3.1	-	
Gate-Drain Charge	Q_{gd}	I_D=-4.0A	-	2.4	-	
Input Capacitance	C_{iss}	V_{DS}=-10V	-	989	-	pF
Output Capacitance	C_{oss}	V_{GS}=0V	-	167	-	
Reverse Transfer Capacitance	C_{rss}	f=1MHz	-	75.5	-	
Turn-On Time	$t_{d(on)}$	V_{DD}=-10V	-	712	-	ns
	t_r	I_D=-1A	-	1386	-	
Turn-Off Time	$t_{d(off)}$	V_{GEN}=-4.5V	-	9.1	-	μs
	t_f	R_G=2.5Ω	-	4	-	

NOTE1: The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C.

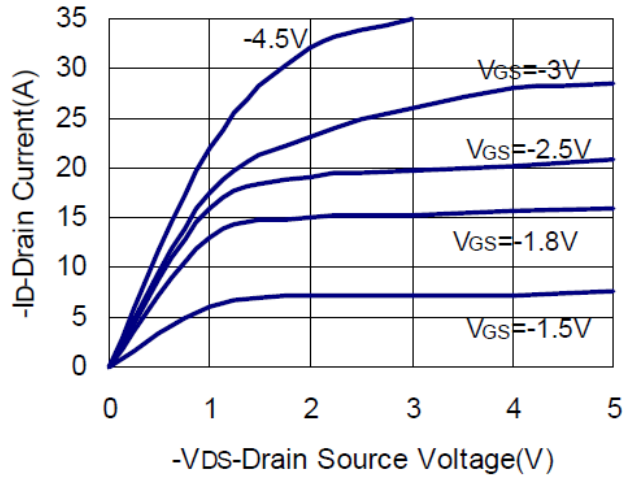
NOTE2: The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%

NOTE3: The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation.

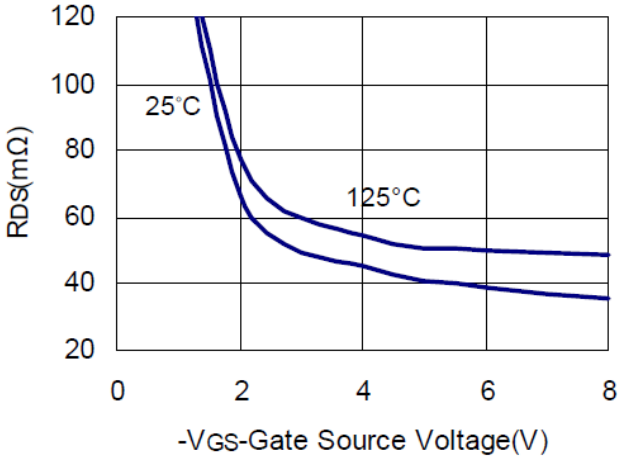
TYPICAL PERFORMANCE CHARACTERISTICS

T_A=25℃, unless Specified

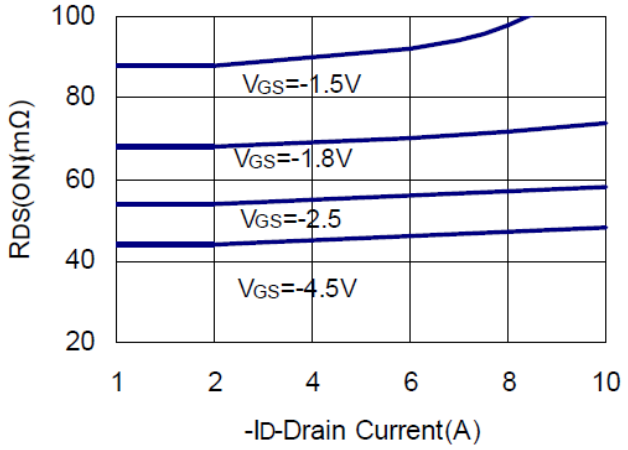
1. Output Characteristics



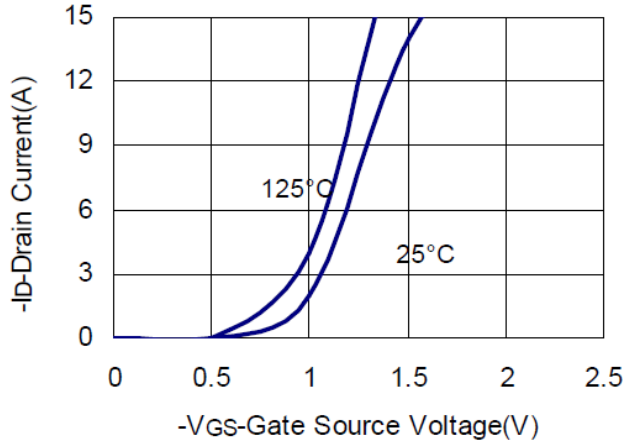
2. Drain-Source On Resistance



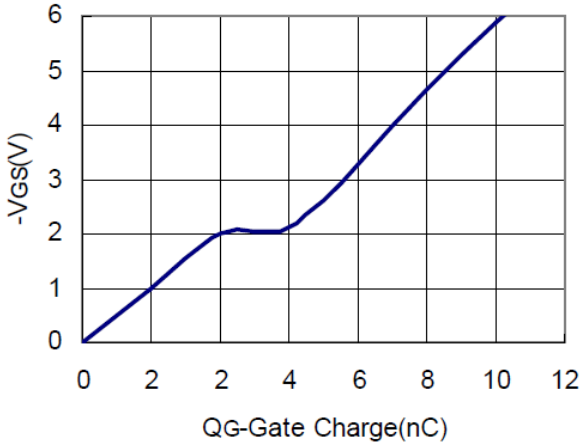
3. Drain Source On Resistance



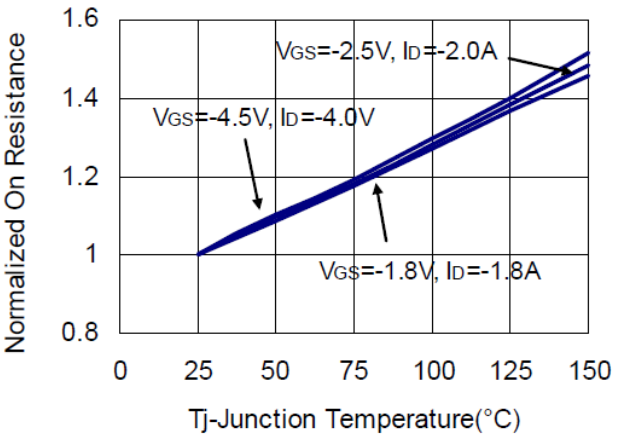
4. Transfer Characteristics



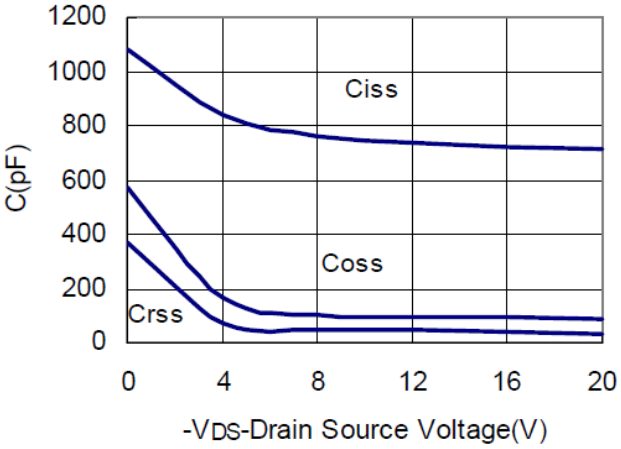
5. Gate Charge



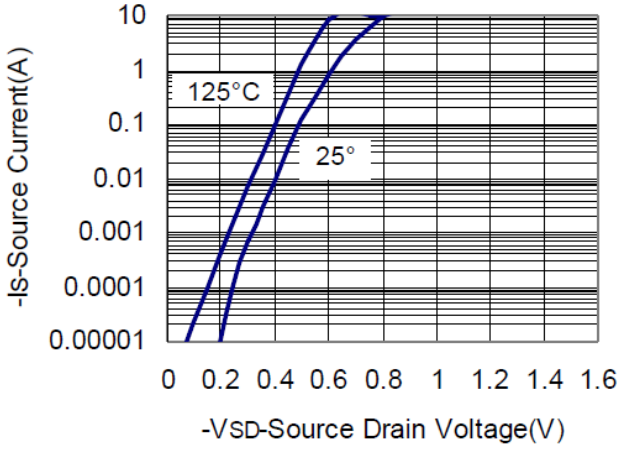
6. Drain Source Resistance



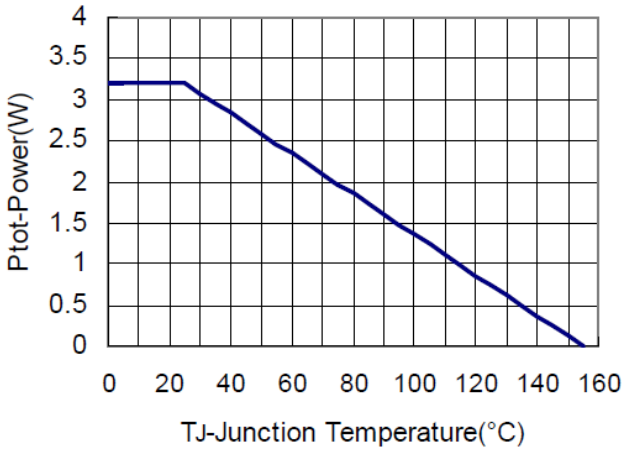
7. Capacitance



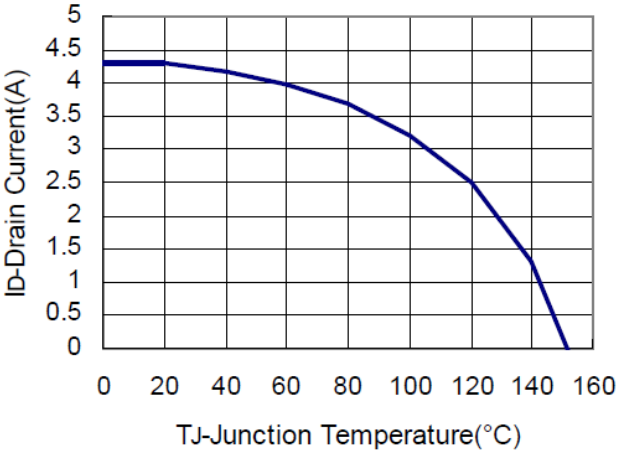
8. Source Drain Diode Forward



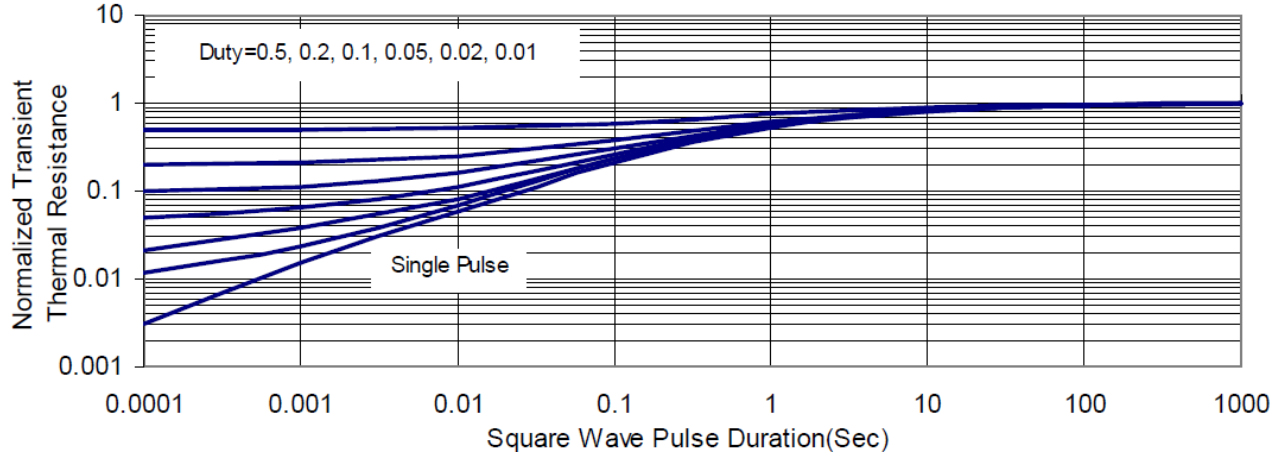
9. Power Dissipation



10. Drain Current

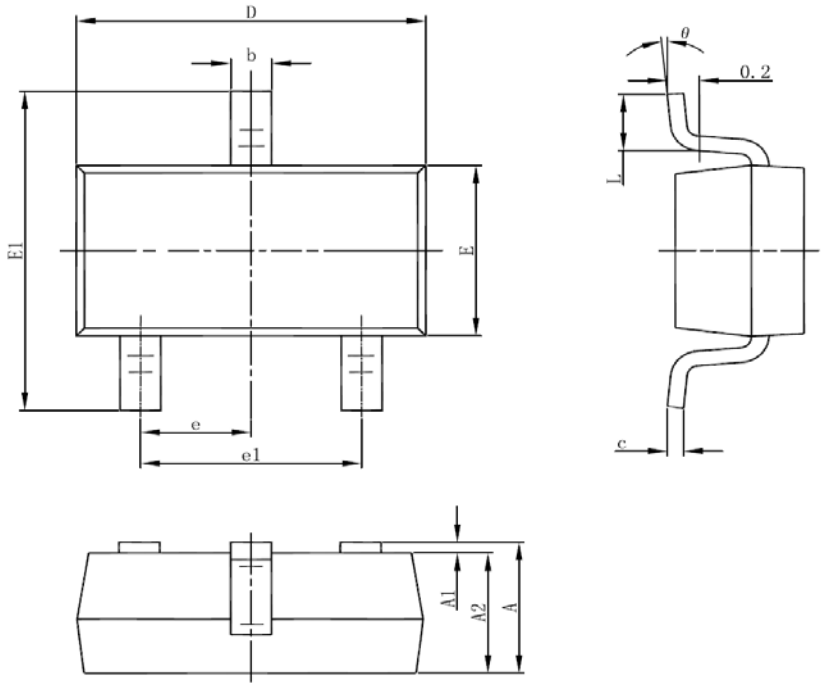


11. Thermal Transient Impedance



PACKAGE INFORMATION

Dimension in SOT-23 Package (Unit: mm)



Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	1.05	1.25	0.041	0.049
A1	0.00	0.10	0.000	0.004
A2	1.05	1.15	0.041	0.045
b	0.30	0.50	0.012	0.020
c	0.10	0.20	0.004	0.008
D	2.82	3.02	0.111	0.119
E	1.50	1.70	0.059	0.067
E1	2.65	2.95	0.104	0.116
e	0.95(BSC)		0.037 (BSC)	
e1	1.80	2.00	0.071	0.079
L	0.30	0.60	0.012	0.024
θ	0°	8°	0°	8°

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