



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

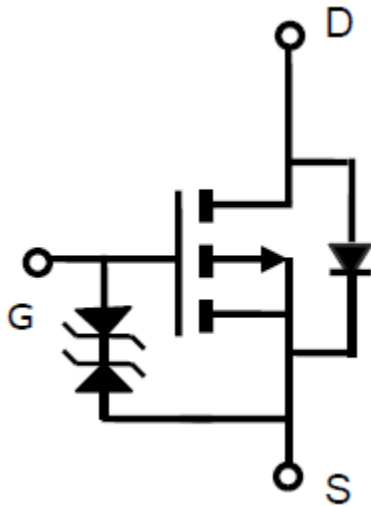
FEATURES

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

APPLICATIONS

- Cellular/Portable
- Load Switch

P-CHANNEL MOSFET

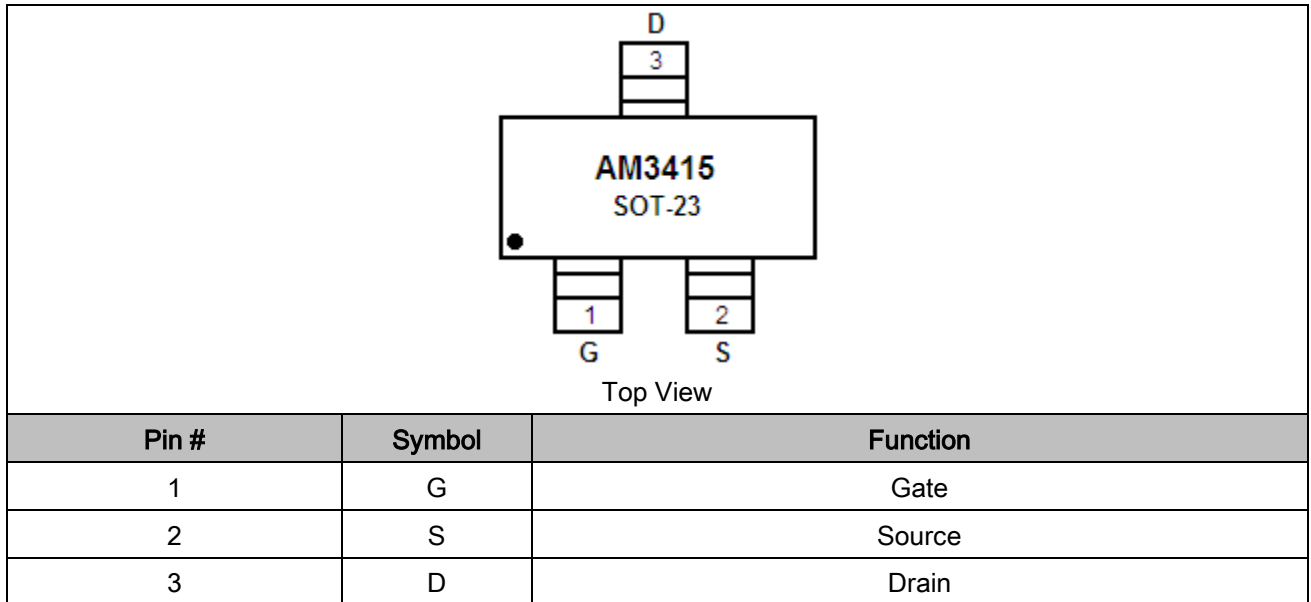


ORDERING INFORMATION

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



PIN DESCRIPTION





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 T _A =25°C ^{Note1}	-4.0 A
	Continuous Drain Current T _A =70°C ^{Note1}	-3.5 A
I _{DM} , Pulsed Drain Current ^{Note2}		-20 A
P _D , Power Dissipation		T _A =25°C
		T _A =70°C
T _J , Operation Junction Temperature		-55 °C to 150°C
T _{STG} , Storage Temperature Range		55 °C to 150°C

Stresses above may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated in the Electrical Characteristics are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

NOTE1: The value of R_{θJA} 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

Symbol	Parameter	Typ.	Max	Unit
R _{θJA}	Thermal Resistance-Junction to Ambient <small>Steady-State</small>	-	140	°C/W
R _{θJL}	Thermal Resistance Junction to Lead <small>Steady-State</small>	-	80	°C/W



ELECTRICAL CHARACTERISTICS

T_J = 25°C 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 Note3}	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		μA
	t _f	R _G =2.5Ω		4		

NOTE1: The value of R_{θJA} 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 ≤ 300μs, duty cycle ≤ 2%

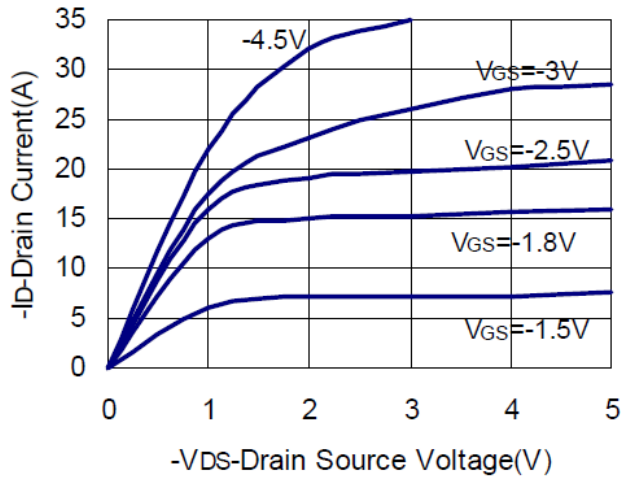
NOTE3: The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation.



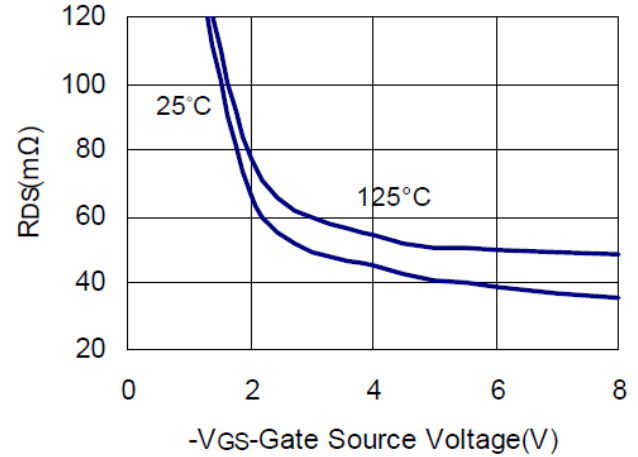
TYPICAL PERFORMANCE CHARACTERISTICS

$T_A=25^\circ\text{C}$ Unless Specified

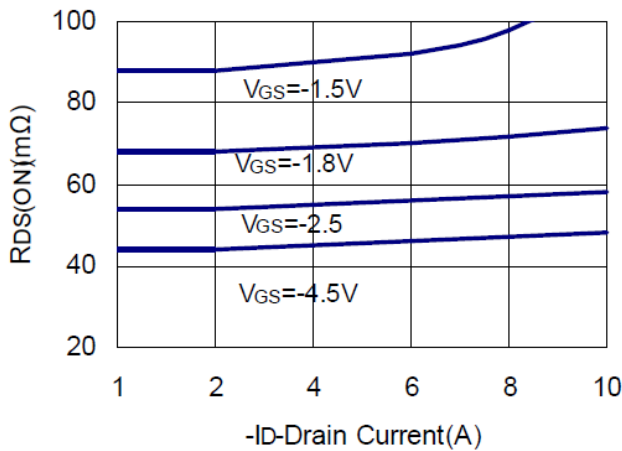
1. Output Characteristics



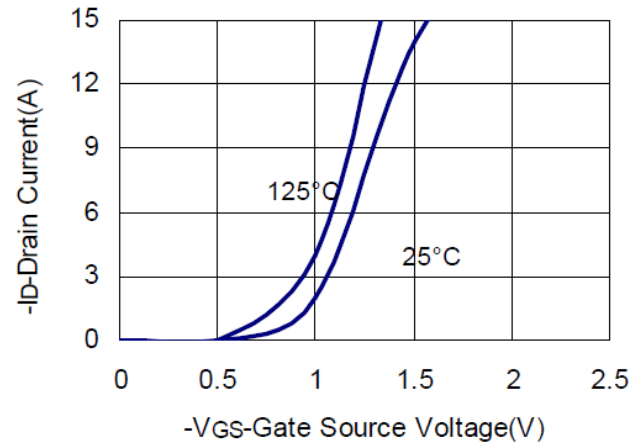
2. Drain-Source On Resistance



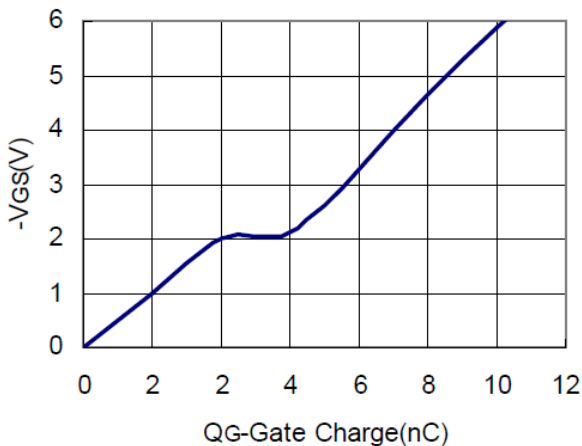
3. Drain Source On Resistance



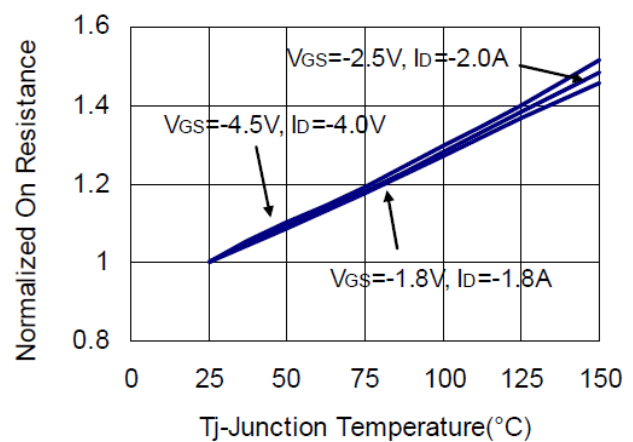
4. Transfer Characteristics



5. Gate Charge

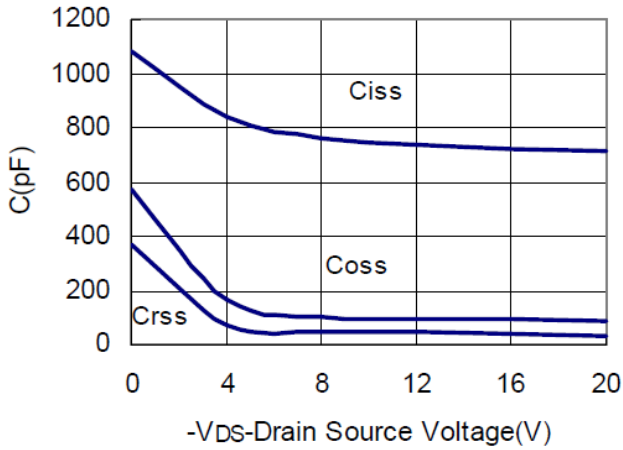


6. Drain Source Resistance

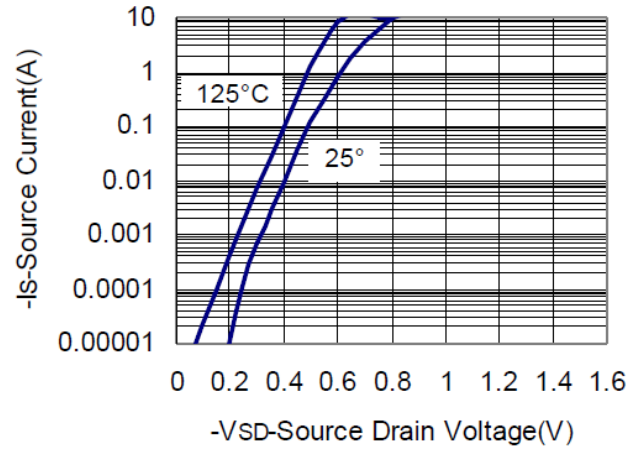




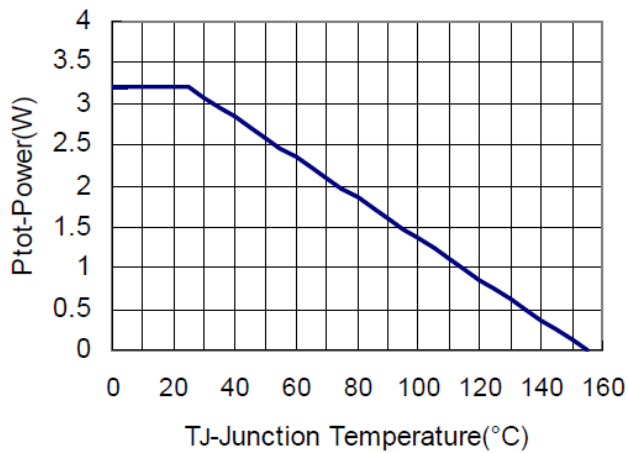
7. Capacitance



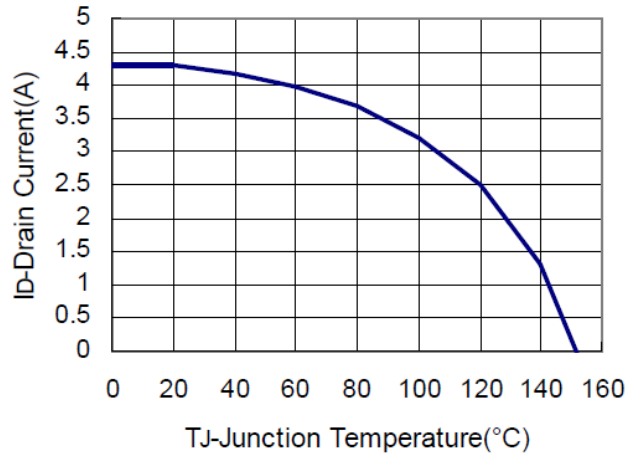
8. Source Drain Diode Forward



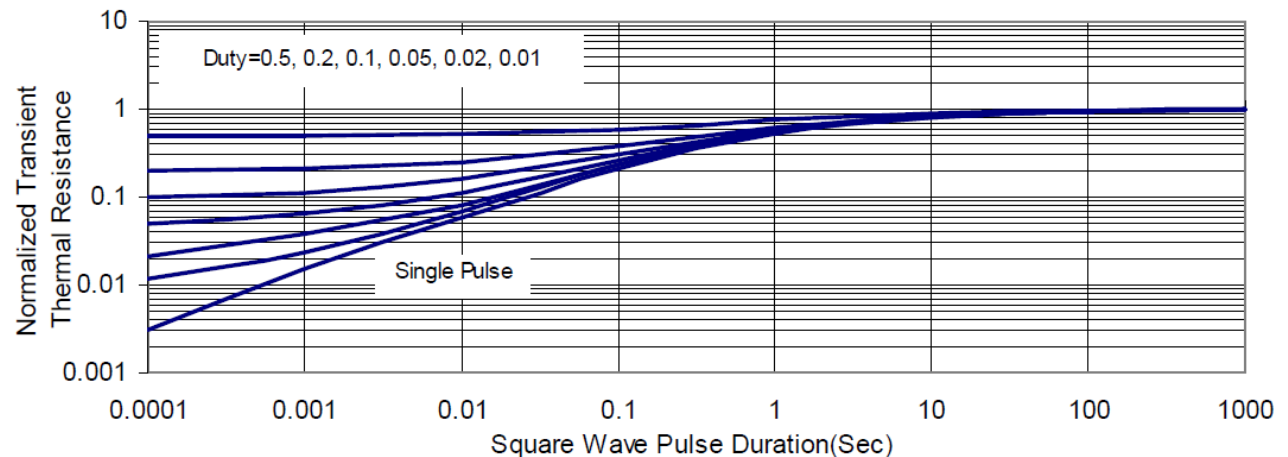
9. Power Dissipation



10. Drain Current



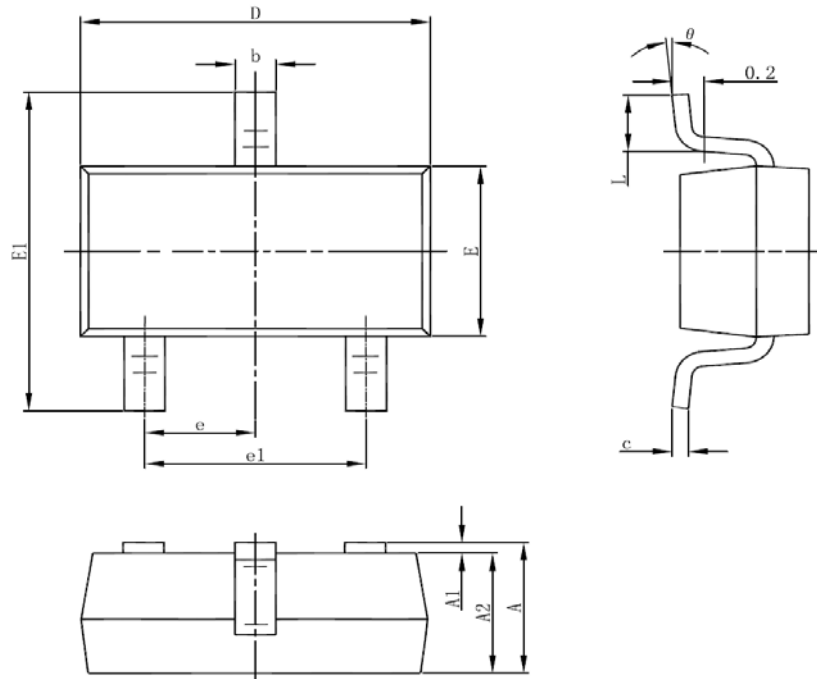
11. Thermal Transient Impedance





PACKAGE INFORMATION

Dimension in SOT-23 Package (Unit: mm)



SYMBOL	MIN	MAX
A	1.050	1.250
A1	0.000	0.100
A2	1.050	1.150
b	0.300	0.500
c	0.100	0.200
D	2.820	3.020
E	1.500	1.700
E1	2.650	2.950
e	0.950(BSC)	
e1	1.800	2.000
L	0.300	0.600
θ	0°	8°



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