DESCRIPTION

The AM3414 is the N-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 as 1.8V.

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

The AM3414 is available in SOT-23 Package

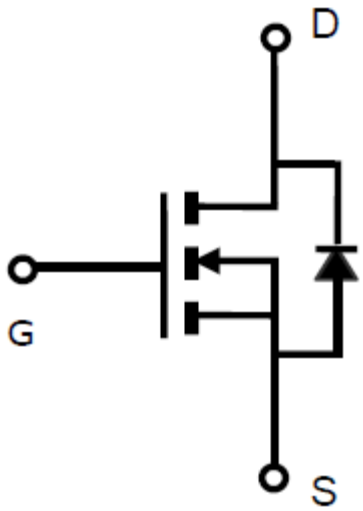
FEATURES

- 20V/5.0A, R_{DS}(ON) =30mΩ(typ.)@V_{GS} =4.5V
- 30V/4.5A, R_{DS}(ON) =42mΩ(typ.)@V_{GS} =2.5V
- 30V/3.8A, R_{DS}(ON) =50mΩ(typ.)@V_{GS} =1.8V
- Super high density cell design for extremely low R_{DS}(ON)
- Exceptional on-resistance and Maximum DC current capability
- RoHs Compliant
- Available in SOT-23 package

APPLICATIONS

- Power Management in Note book
- Portable Equipment
- DSC
- LCD Display inverter
- Battery Powered System

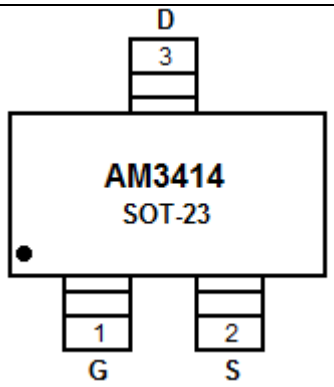
P-CHANNEL MOSFET



ORDERING INFORMATION

Package Type	Part Number	
SOT-23	E3	AM3414E3R
		AM3414E3VR
Note	V: Green Package R : Tape & Reel	
AiT provides all Pb free products Suffix " V " means Green Package		

PIN DESCRIPTION



Top View

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

ABSOLUTE MAXIMUM RATINGS

T_A = 25℃ Unless otherwise noted

V_{DSS}, Drain-Source Voltage				20 V
V_{GSS}, Gate-Source Voltage				±12 V
I_D	Continuous Drain Current	T_C=25°C[Note1]	V_{GS}=10V	5.0 A
	Continuous Drain Current	T_C=70°C[Note1]		4.0A
I_{DM}, Pulsed Drain Current[Note2]				20 A
P_D, Power Dissipation			T_A=25°C	1.4 W
			T_A=70°C	0.9 W
T_J, Operation Junction Temperature				-55 ℃ to 150℃
T_{STG}, Storage Temperature Range				-55 ℃ to 150℃

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.

NOTE: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

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

Symbol	Parameter	Typ.	Max	Unit
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient[Note1] Steady-State	-	120	°C/W
$R_{\theta JL}$	Thermal Resistance Junction to Lead[Note1] Steady-State	-	80	°C/W

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.

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	0.5		1.0	V
Gate Leakage Current	I_{GSS}	V_{DS}=0V,V_{GS}=±12V			±100	nA
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= 5.0A		30	38	mΩ
		V_{GS}=2.5V,I_D= 4.5A		42	48	
		V_{GS}=1.8V,I_D= 3.8A		50	65	
Forward Transconductance	G_{fs}	V_{DS}= 15V,I_D= 5.0A		30		S
Source-Drain Diode						
Diode Forward Voltage	V_{SD}	I_S=1.7A,V_{GS}=0V		0.9	1.2	V
Continuous Source Current[Note1 Note3]	I_S				6	A
Dynamic Parameters						
Total Gate Charge	Q_g (4.5V)	V_{DS}= 10V		11	13	nC
Gate-Source Charge	Q_{gs}	V_{GS}= 4.5V		1.45		
Gate-Drain Charge	Q_{gd}	I_D≡ 5.0A		2.3		
Input Capacitance	C_{iss}	V_{DS}= 10V		578		pF
Output Capacitance	C_{oss}	V_{GS}=0V		116		
Reverse Transfer Capacitance	C_{rss}	f=1MHz		96		
Turn-On Time	$t_{d(on)}$	V_{DD}= 10V		14.5	25	nS
	t_r	I_D= 1.0A		42	62	
Turn-Off Time	$t_{d(off)}$	V_{GEN}= 4.5V		46	67	
	t_f	R_G=6Ω		34	43	

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

Figure1. Output Characteristics

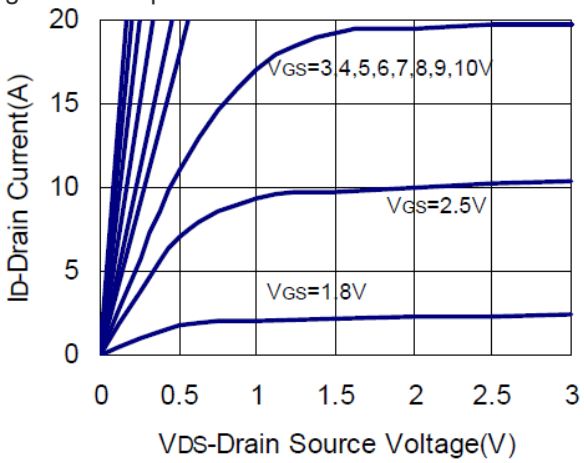


Figure2. Drain-Source On Resistance

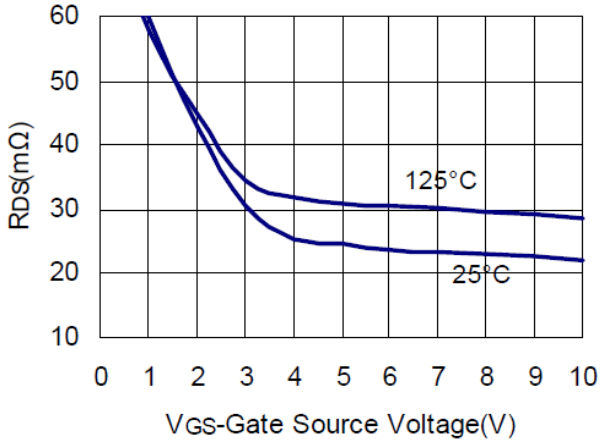


Figure 3. Drain Source On Resistance

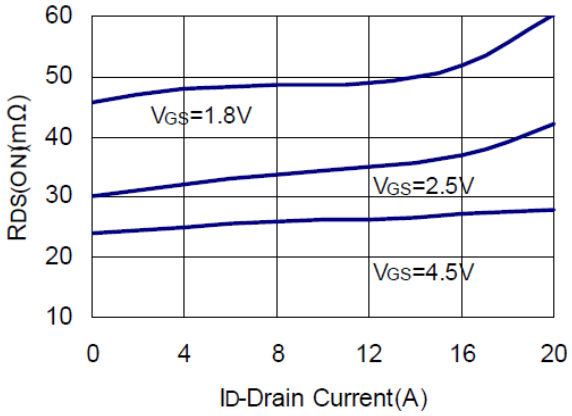


Figure 4. Gate Threshold Voltage

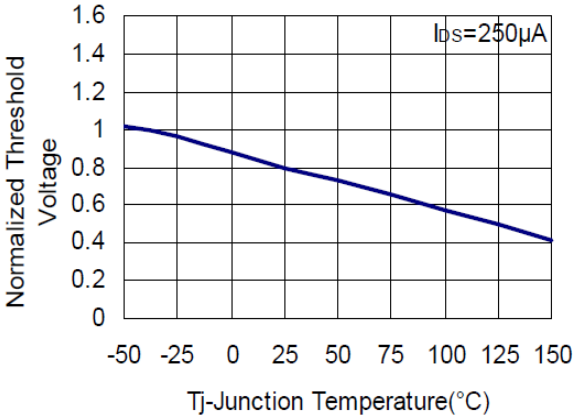


Figure 5. Gate Charge

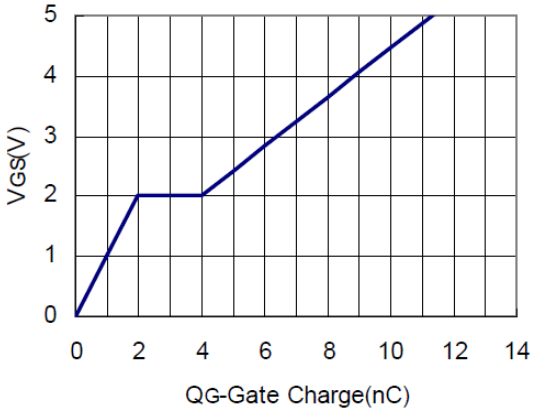


Figure 6. Drain Source Resistance

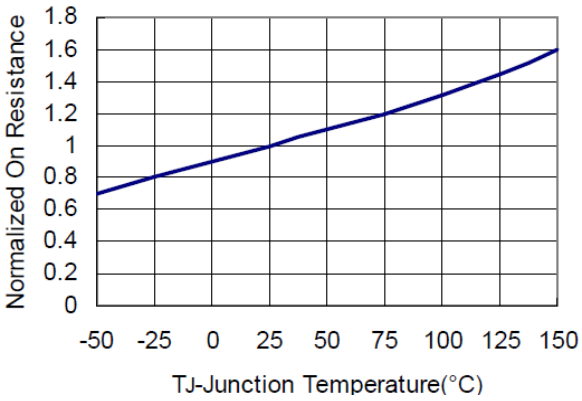


Figure7. Capacitance

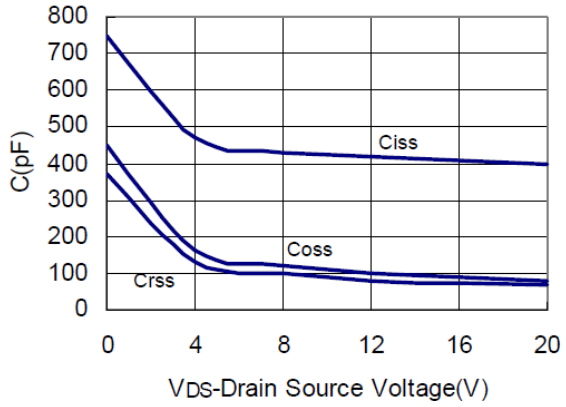


Figure 8. Source Drain Diode Forward

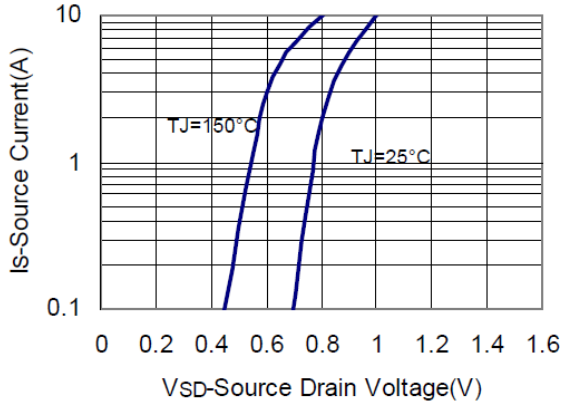


Figure9. Power Dissipation

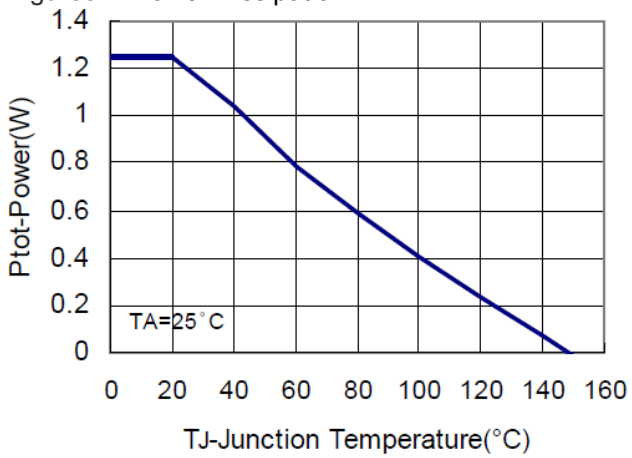


Figure10. Drain Current

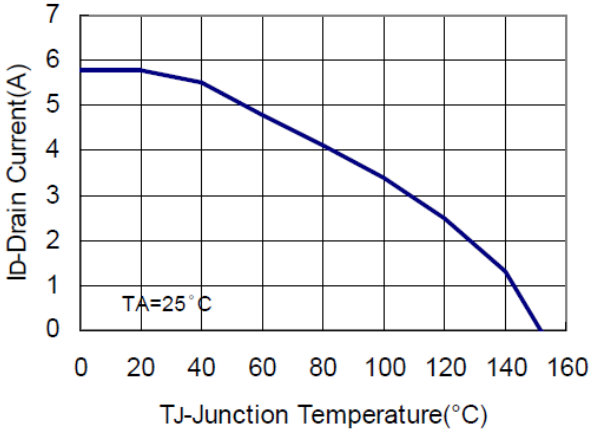
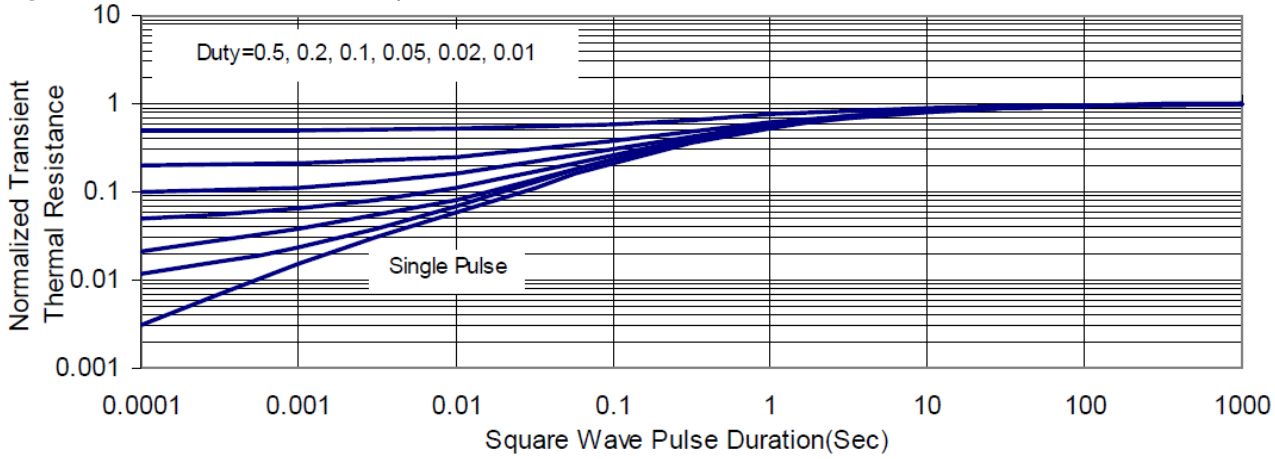
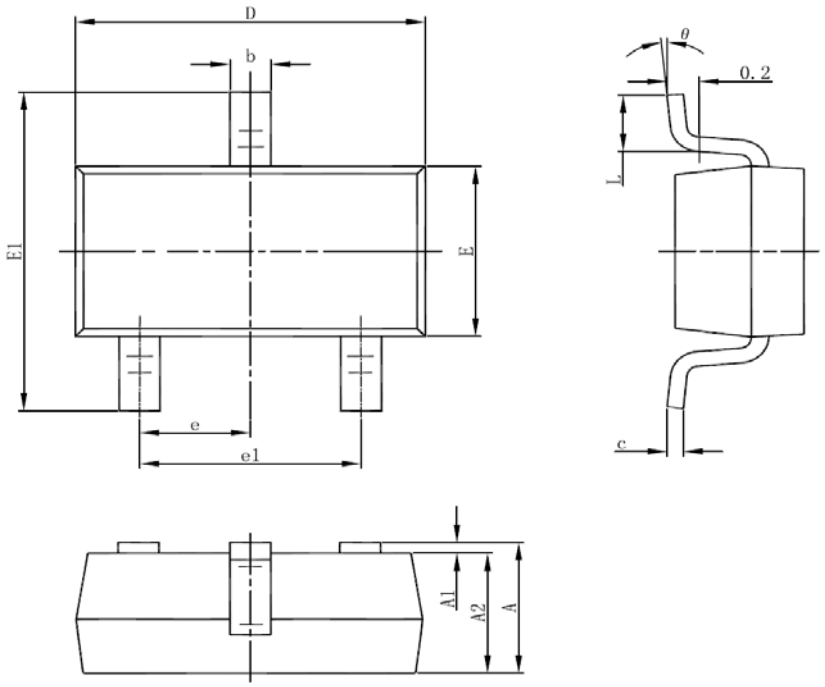


Figure11. Thermal Transient Impedance



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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