DESCRIPTION

AM7407 is the P-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior, fast switching performance, and withstand high energy pulse in the avalanche and commutation mode.

AM7407 is available in a DFN8(3.3x3.3) package.

FEATURES

- V_{DS} = -20V, I_D = -42A
  $R_{DS(ON)}$=6.5mΩ(Typ.)@V_{GS}=-10V
  $R_{DS(ON)}$=7.8mΩ(Typ.)@V_{GS}=-4.5V
  $R_{DS(ON)}$=10mΩ(Typ.)@V_{GS}=-2.5V
  $R_{DS(ON)}$=13mΩ(Typ.)@V_{GS}=-1.8V
- Available in a DFN8(3.3x3.3) package.

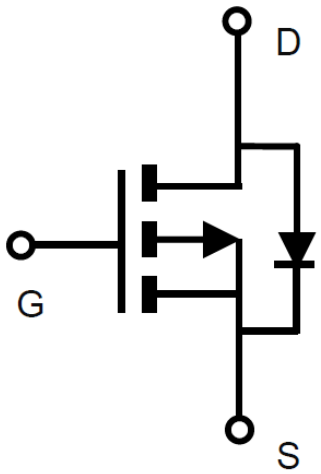
ORDERING INFORMATION

Package Type	Part Number	
DFN8 SPQ: 3,000pcs/Reel	J8	AM7407J8R
		AM7407J8VR
Note	V: Halogen free Package R: Tape & Reel	
AiT provides all RoHS products		

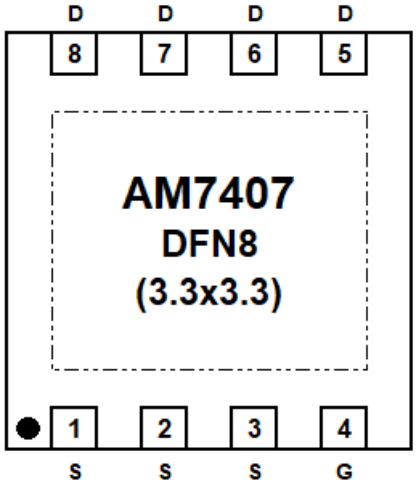
APPLICATION

- Portable Equipment
- Power Management
- Battery Powered Systems

PIN DESCRIPTION



PIN DESCRIPTION



Top View

Pin #	Symbol	Function
1	S	Source
2	S	Source
3	S	Source
4	G	Gate
5	D	Drain
6	D	Drain
7	D	Drain
8	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 (V_{GS}=-4.5V)	T_C=25°C	-42A
	T_C=100°C	-26.6A
I_{DM}, Pulsed Drain Current NOTE1		-120A
I_D, Continuous Drain Current (V_{GS}=-4.5V)	T_A=25°C	-14A
	T_A=70°C	-11.2A
P_D, Power Dissipation NOTE2	T_A=25°C	3.1W
	T_A=70°C	2W
I_{AS}, Avalanche Current NOTE1		-35A
E_{AS}, Single Pulse Avalanche energy L=0.1mH NOTE1,6		61mJ
P_D, Power Dissipation NOTE3	T_C=25°C	29W
	T_C=100°C	11.6W
T_J, Operation Junction Temperature		-55°C~+150°C
T_{STG}, Storage Temperature Range		-55°C~+150°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.

THERMAL CHARACTERISTICS

Parameter		Symbol	Typ.	Max.	Units
Thermal Resistance Junction to Ambient NOTE2	t≦10s	$R_{\theta JA}$	-	40	°C/W
Thermal Resistance Junction to Ambient NOTE2,4	Steady-State		-	65	
Thermal Resistance Junction to Case	Steady-State	$R_{\theta JC}$	-	4.3	

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-ambient thermal resistance, t ≦10sec.

NOTE4: $T_{J(MAX)}$=150°C, using junction-to-case thermal resistance ($R_{\theta JC}$) is more useful in additional heat sinking is used.

ELECTRICAL CHARACTERISTICS

T_A = 25°C, unless otherwise noted

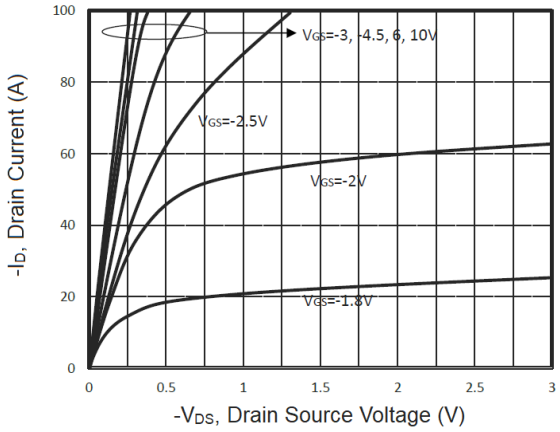
Parameter	Symbol	Conditions	Min	Typ.	Max	Units
Static Parameters						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_D=-250μA	-20	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250μA	-0.4	-0.5	-1	V
Gate Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±12V	-	-	±100	nA
Zero Gate Voltage Drain 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[NOTE5]	$R_{DS(ON)}$	V_{GS} =-10V,I_D=-14A	-	6.5	8.5	mΩ
		V_{GS} =-4.5V,I_D=-14A	-	7.8	10	
		V_{GS}=-2.5V, I_D=-10A	-	10	13	
		V_{GS}=-1.8V, I_D=-5A	-	13	18	
Forward Transconductance	Gfs	V_{DS}=-10V, I_D=-10A	-	25	-	S
Diode Characteristics						
Diode Forward Voltage[NOTE5]	V_{SD}	I_S=-1A, V_{GS}=0V	-	-0.6	-1	V
Continuous Source Current	I_S		-	-	-42	A
Reverse Recovery Time	t_{rr}	I_S=-14A, dI/dt=100A/μs	-	15	-	ns
Reverse Recovery Charge	Q_{rr}		-	6.2	-	nC
Dynamic and Switching Parameters						
Total Gate Charge	Q_g	V_{DS}=-10V, V_{GS}=-4.5V, I_D=-14A	-	41	55.4	nC
Gate-Source Charge	Q_{gs}		-	6.2	8.4	
Gate-Drain Charge	Q_{gd}		-	10.6	14.3	
Input Capacitance	C_{iss}	V_{DS}=-10V, V_{GS}=0V, f=1.0MHz	-	3342	-	pF
Output Capacitance	C_{oss}		-	290	-	
Reverse Transfer Capacitance	C_{rss}		-	256	-	
Turn-On Time[NOTE5]	$t_{d(on)}$	V_{DD}=-10V, V_{GEN}=-4.5V, R_G=3.3Ω, I_D=-14A	-	14	27	ns
	t_r		-	52	99	
Turn-Off Time[NOTE5]	$t_{d(off)}$		-	110	209	
	t_f		-	32	61	

NOTE5: The data tested by pulsed , pulse width ≦ 300μs , duty cycle ≦ 2%.

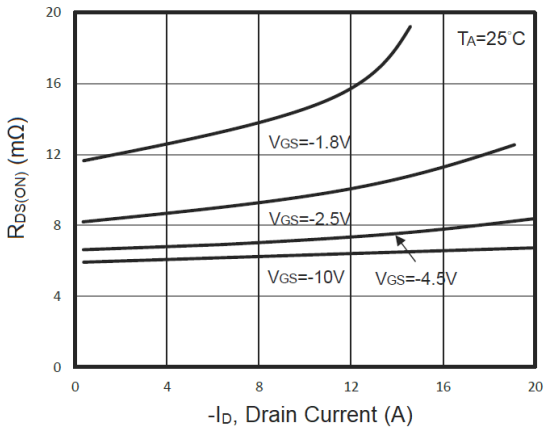
NOTE6: The E_{AS} data shows Max, tested and pulse width limited by $T_{J(MAX)}$=150°C (initial temperature T_J=25°C).

TYPICAL CHARACTERISTICS

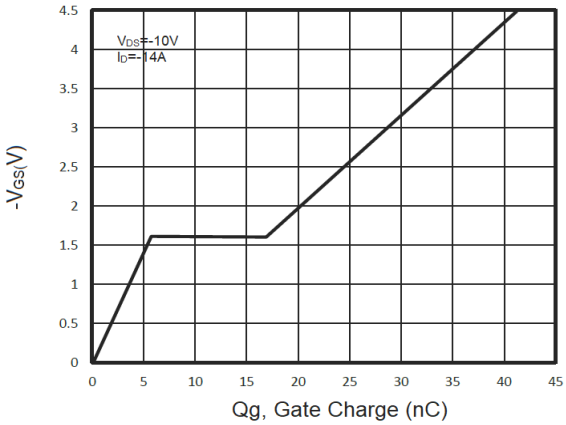
1. Output Characteristics



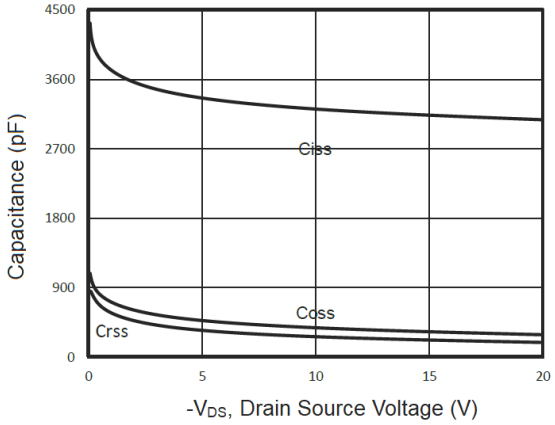
2. Drain-Source On Resistance



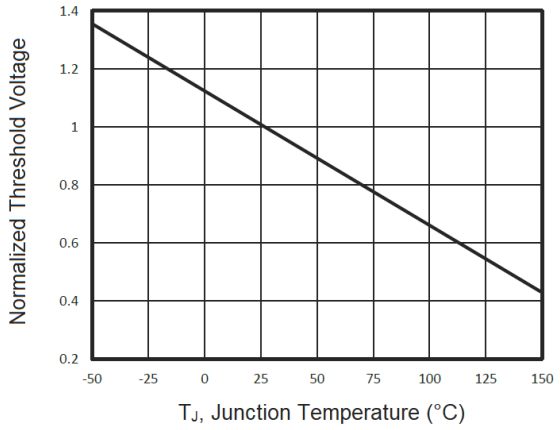
3. Gate Charge



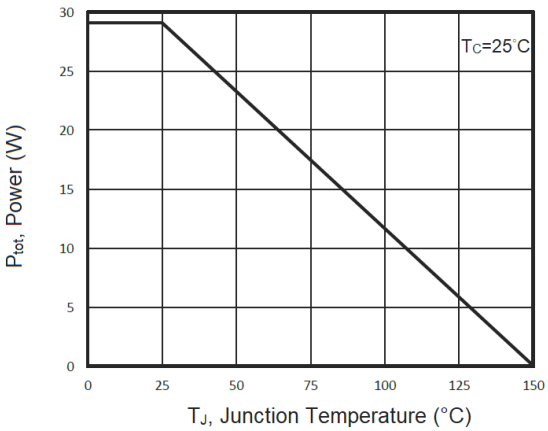
4. Capacitance



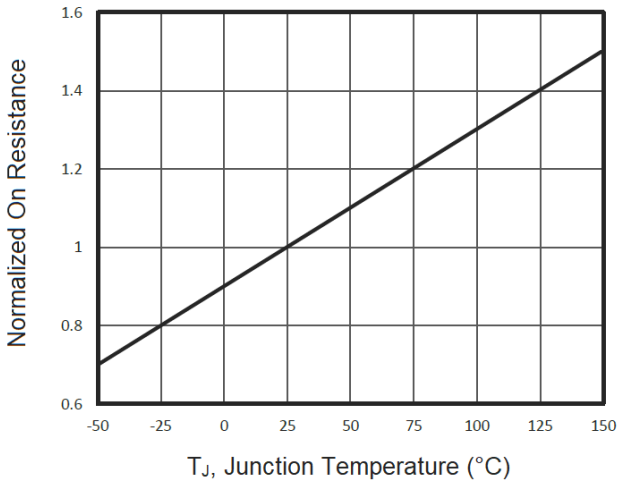
5. Gate Threshold Voltage



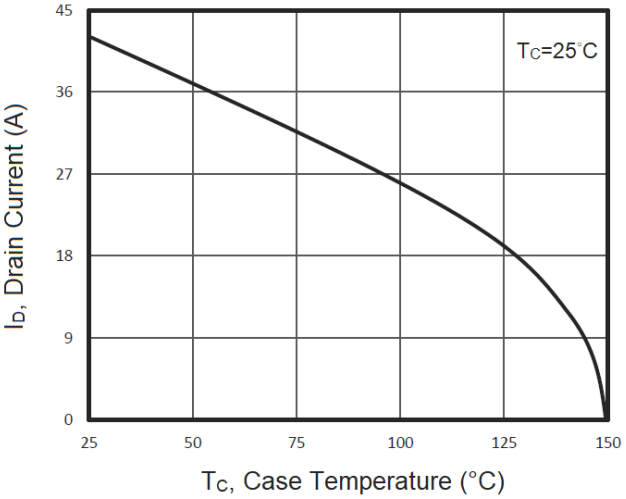
6. Power Dissipation



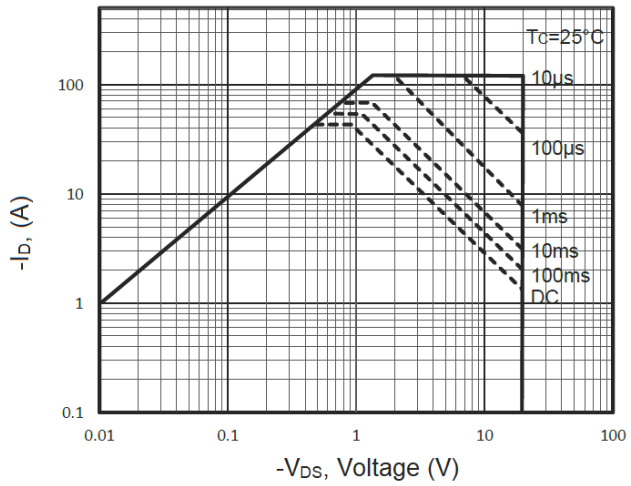
7. $R_{DS(ON)}$ vs. Junction Temperature



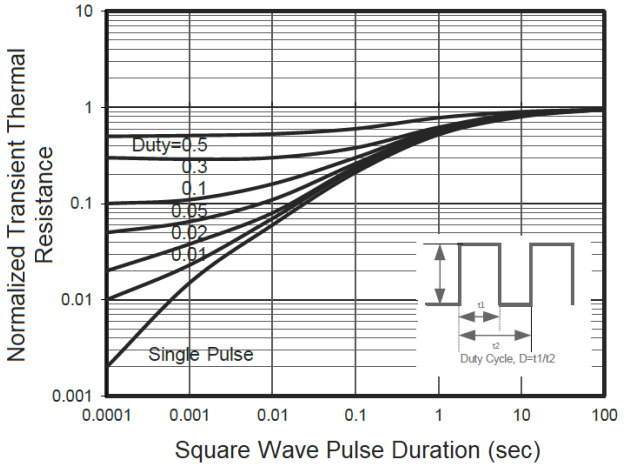
8. Drain Current vs. T_C



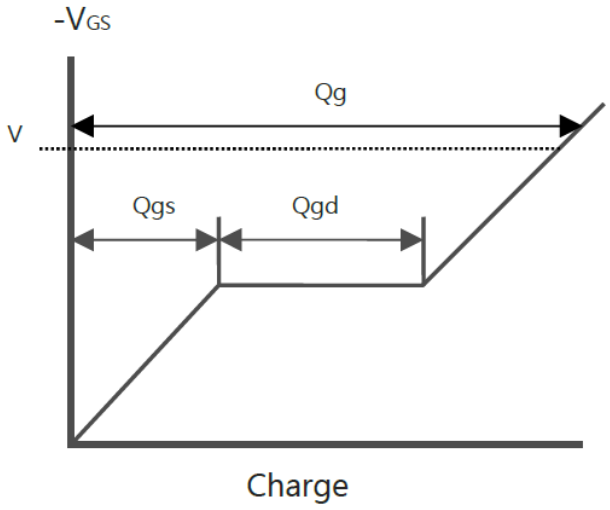
9. Maximum Safe Operation Area



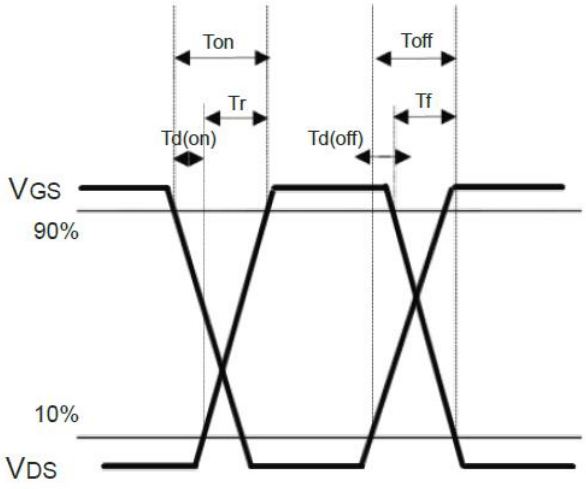
10. Thermal Transient Impedance



11. Gate Charge Waveform

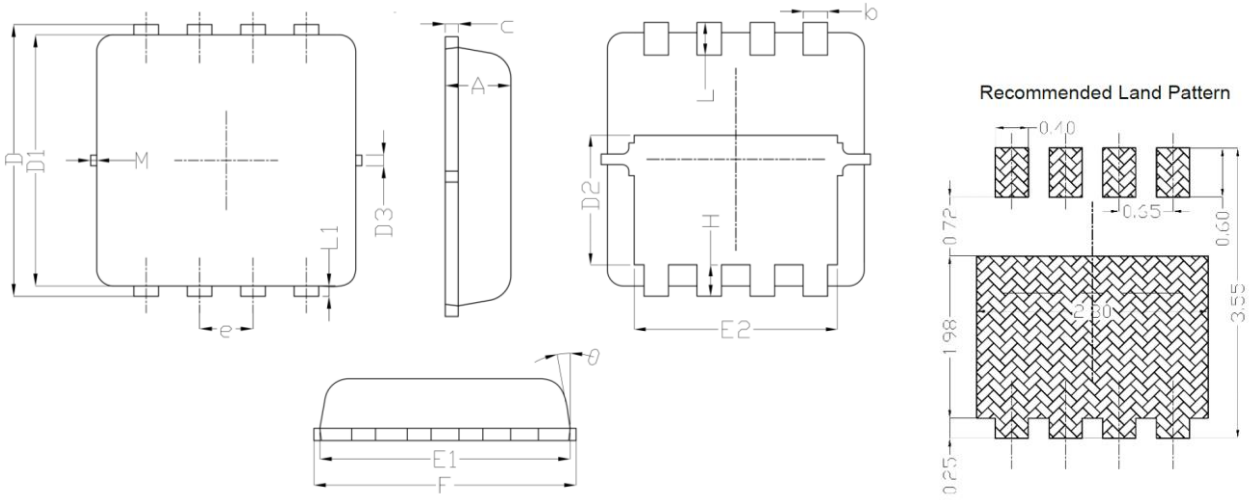


12. Switching Time Waveform



PACKAGE INFORMATION

Dimension in DFN8(3.3x3.3) (Unit: mm)



Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	0.700	0.800	0.028	0.031
b	0.250	0.350	0.010	0.014
c	0.100	0.250	0.004	0.010
D	3.300	3.400	0.130	0.134
D1	3.250	3.450	0.128	0.136
D2	1.780	1.980	0.070	0.078
D3	-	0.130	-	0.005
E	3.200	3.400	0.126	0.134
E1	3.000	3.200	0.118	0.126
E2	2.390	2.590	0.094	0.102
e	0.65 BSC		0.026 BSC	
H	0.300	0.500	0.012	0.020
L	0.300	0.500	0.012	0.020
L1	-	0.130	-	0.005
M	-	0.150	-	0.006
θ	0°	12°	0°	15°

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