DESCRIPTION

AM7401 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. These devices are well suited for high efficiency load switching applications.

AM74001 is available in a DFN8(3.3x3.3) package.

FEATURES

- V_{DS}= -30V, I_D= -39A
  $R_{DS(ON)}$=10.5mΩ(Typ.)@ V_{GS}=-10V
  $R_{DS(ON)}$=14mΩ(Typ.)@ V_{GS}=-4.5V
- 100% UIS and Rg tested
- Available in a DFN8(3.3x3.3) package.

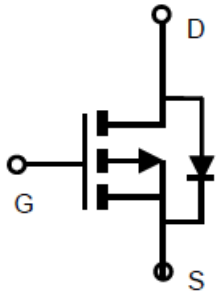
ORDERING INFORMATION

Package Type	Part Number	
DFN8(3.3x3.3) SPQ: 3,000pcs/Reel	J8	AM7401J8R
		AM7401J8VR
Note	V: Halogen free Package R: Tape & Reel	
AiT provides all RoHS products		

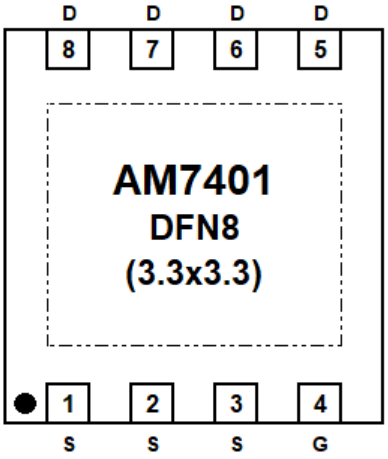
APPLICATION

- LED Application
- Power Management
- Load switch

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℃, unless otherwise noted

V_{DSS}, Drain-Source Voltage		-30V
V_{GSS}, Gate-Source Voltage		±25V
I_D, Continuous Drain Current	T_C=25°C	-39A
	T_C=100°C	-24.7A
I_{DM}, Pulsed Drain Current[NOTE1]		-156A
I_D, Continuous Drain Current	T_A=25°C	-12.3A
	T_A=70°C	-10A
P_D, Power Dissipation[NOTE2]	T_A=25°C	3.1W
	T_A=70°C	2W
I_{AS}, Avalanche Current[NOTE1]		-30A
E_{AS}, Single Pulse Avalanche energy L=0.1mH[NOTE1,6]		45mJ
P_D, Power Dissipation[NOTE3]	T_C=25°C	31.3W
	T_C=100°C	12.5W
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.

THERMAL CHARACTERISTICS

Parameter		Symbol	Limit	Units
Thermal Resistance Junction to Ambient[NOTE2]	t≦10s	$R_{\theta JA}$	40	°C/W
Thermal Resistance Junction to Ambient[NOTE2,4]	Steady-State		60	
Thermal Resistance Junction to Case		$R_{\theta JC}$	4	°C/W

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	-30	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250μA	-1	-1.6	-2.5	V
Gate Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±25V	-	-	±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-30V,V_{GS}=0V T_J =25°C	-	-	-1	μA
		V_{DS}=-24V,V_{GS} =0V T_J =75°C	-	-	-10	
Drain-source On-Resistance[NOTE5]	$R_{DS(ON)}$	V_{GS} =-10V,I_D=-12.3A	-	10.5	13	mΩ
		V_{GS} =-4.5V,I_D=-10A	-	14	18	
Forward Transconductance	G_{FS}	V_{DS} =-10V,I_D=-10A	-	12.5	-	S
Diode Characteristics						
Diode Forward Voltage[NOTE5]	V_{SD}	I_S=-1A, V_{GS}=0V	-	-0.7	-1	V
Continuous Source Current	I_S		-	-	-39	A
Reverse Recovery Time	t_{rr}	I_S =-10A, dI/dt=100A/μs	-	13.8	-	ns
Reverse Recovery Charge	Q_{rr}		-	12.3	-	nC
Dynamic and Switching Parameters						
Total Gate Charge(10V)	Q_g	V_{DS}=-15V, V_{GS}=-10V, I_D=-10A	-	36	48.6	nC
Total Gate Charge(4.5V)	Q_g		-	18	24.3	
Gate-Source Charge	Q_{gs}		-	8.1	10.9	
Gate-Drain Charge	Q_{gd}		-	11.5	15.5	
Input Capacitance	C_{iss}	V_{DS}=-15V, V_{GS}=0V, f=1MHz	-	2590	-	pF
Output Capacitance	C_{oss}		-	283	-	
Reverse Transfer Capacitance	C_{rss}		-	172	-	
Gate Resistance	R_g	V_{GS}=0V, V_{DS}=0V, f=1MHz	-	8.8	-	Ω
Turn-On Time[NOTE5]	$t_{d(on)}$	V_{DD}=-15V, V_{GEN}=-10V, R_G=3Ω, I_D=-1A	-	19.1	36	ns
	t_r		-	4.8	9	
Turn-Off Time[NOTE5]	$t_{d(off)}$		-	58	110	
	t_f		-	11.5	22	

NOTE1: Pulsed width limited by maximum junction temperature, $T_{J(MAX)}$=150°C.

NOTE2: Measure the value in a still air environment at T_A=25°C, using an installation mounted on a 1 in^2 FR-4 board, maximum junction temperature $T_{J(MAX)}$=150°C.

NOTE3: Using junction-to-case thermal resistance, dissipation limit in the case of additional heat.

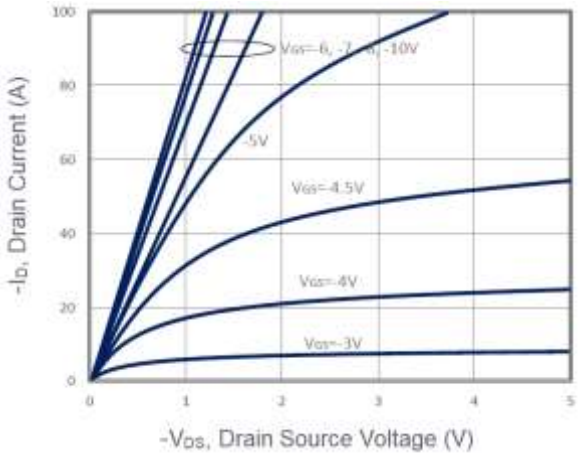
NOTE4: $T_{J(MAX)}$=150°C,using junction-to-case thermal resistance ($R_{\theta JC}$) is more useful in additional heat sinking is used.

NOTE5: The pulse test width is ≤300μs and the duty cycle ≦ 2%.

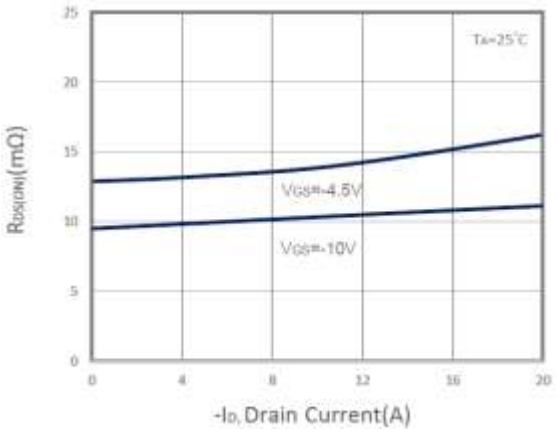
NOTE6: The E_{AS} data shows Maximum, tested and pulse width limited by maximum.

TYPICAL CHARACTERISTICS

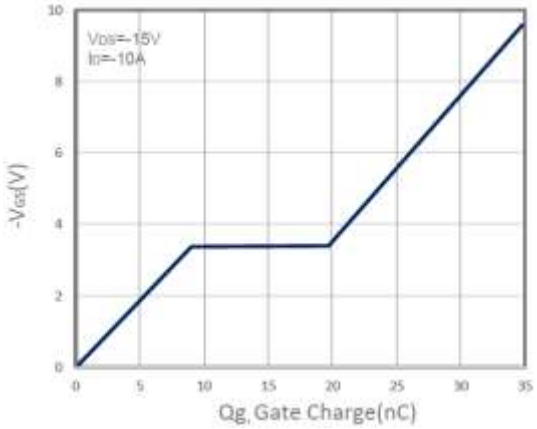
1. Output Characteristics



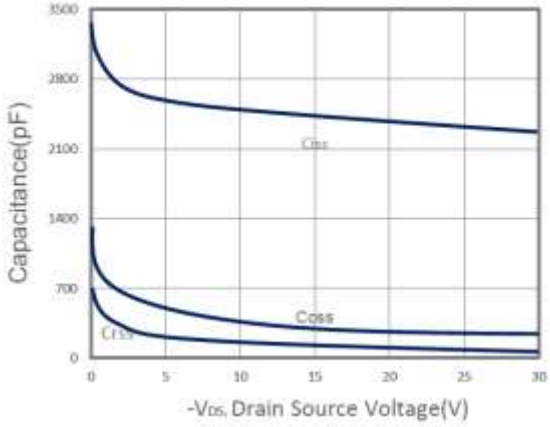
2. Drain-Source On Resistance



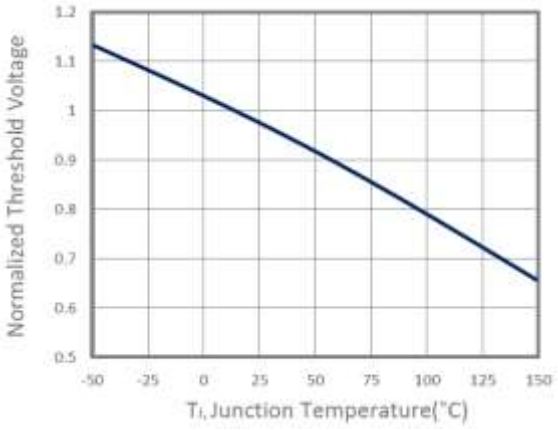
3. Gate Charge



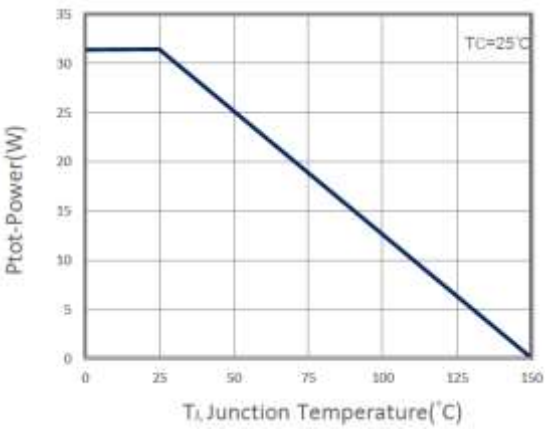
4. Capacitance



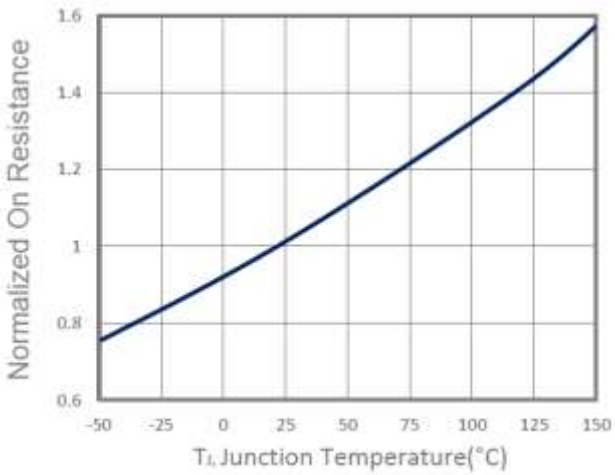
5. Gate Threshold Voltage



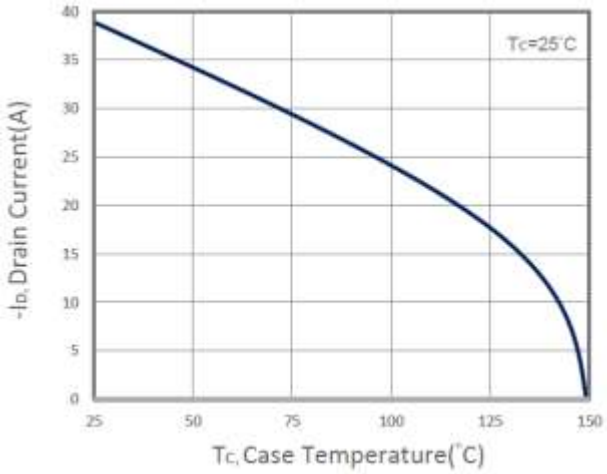
6. Power Dissipation



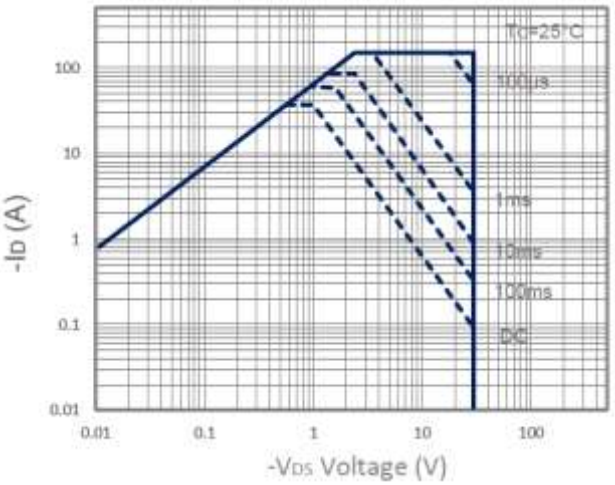
7. $R_{DS(ON)}$ vs Junction Temperature



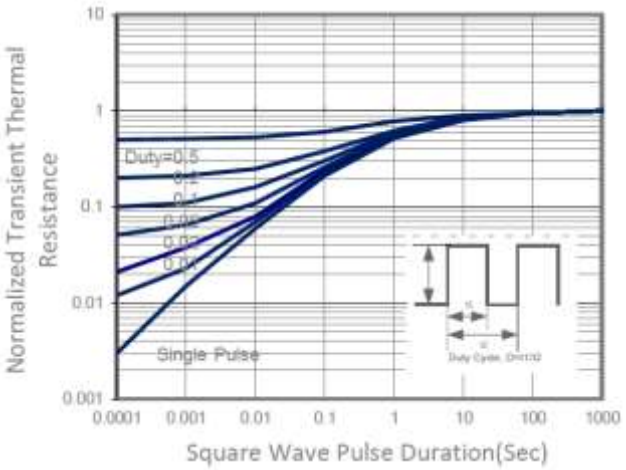
8. Drain Current vs. T_C



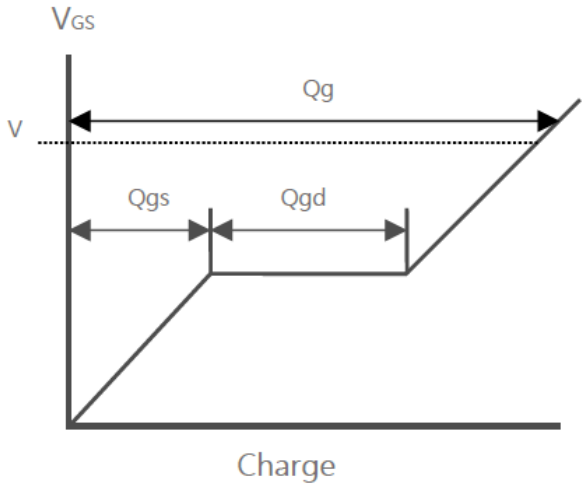
9. Maximum Safe Operation Area



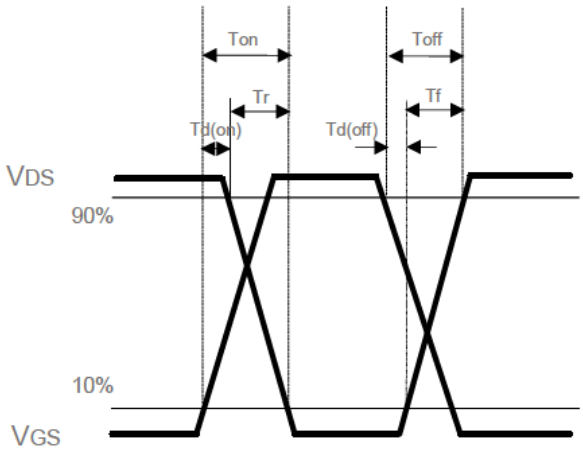
10. Thermal Transient Impedance



11. Gate Charge Waveform

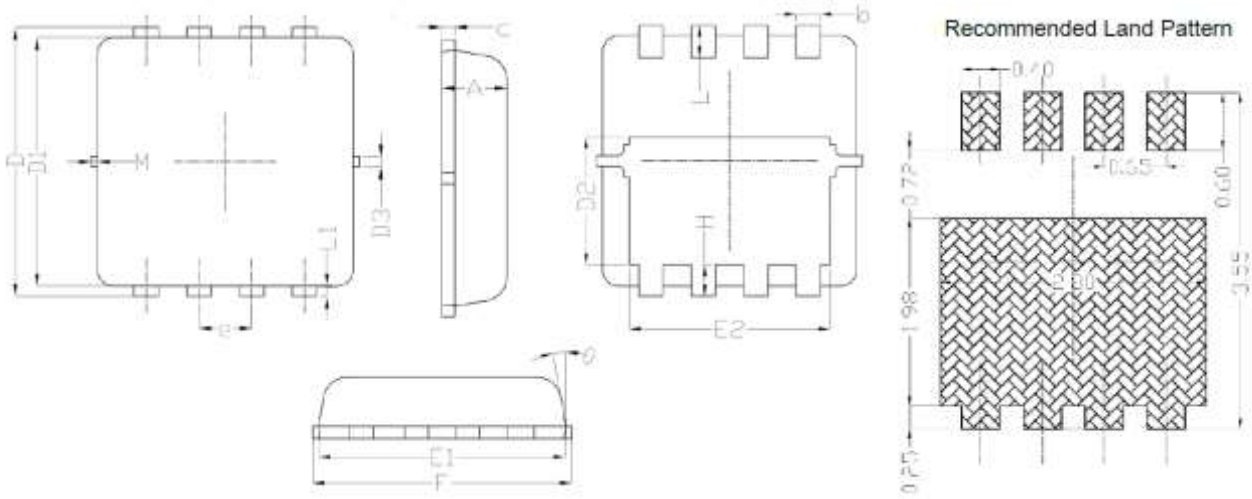


12. Switching Time Waveform



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	0.650 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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