DESCRIPTION

AM4453 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. These devices are well suited for high efficiency fast switching applications.

The AM4453 is available in SOP8 package.

ORDERING INFORMATION

Package Type	Part Number	
SOP8 SPQ: 2,500pcs/Reel	M8	AM4453M8R
		AM4453M8VR
Note	V: Halogen free Package R: Tape & Reel	
AiT provides all RoHS products		

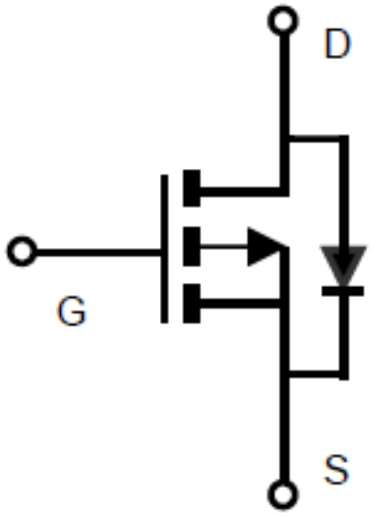
FEATURES

- V_{DS} = -20V, I_D = -10.7A
  $R_{DS(ON)}$=12mΩ(Typ.)@V_{GS}=-10V
  $R_{DS(ON)}$=14mΩ(Typ.)@V_{GS}=-4.5V
  $R_{DS(ON)}$=18mΩ(Typ.)@V_{GS}=-2.5V
  $R_{DS(ON)}$=23mΩ(Typ.)@V_{GS}=-1.8V
- Fast switch
- Low gate charge
- High power and current handling capability
- Available in SOP8 Package

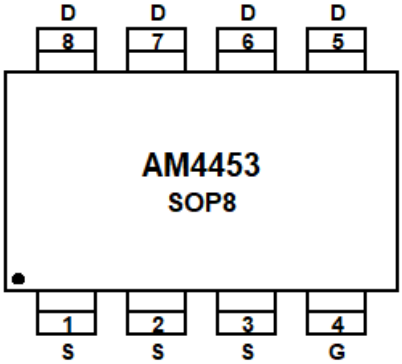
APPLICATIONS

- LED Application
- Portable Equipment
- DC-DC Power Management

TYPICAL APPLICATION



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	T_A = 25°C	-10.7A
	T_A= 70°C	-8.6A
I_{DM}, Pulsed Drain Current[NOTE1]		-42.8A
I_{AS}, Avalanche Current[NOTE1]		-25A
E_{AS}, Single Pulse Avalanche energy L=0.1mH[NOTE1,6]		31mJ
P_D, Power Dissipation[NOTE3]	T_A = 25°C	3.1W
	T_A= 70°C	2W
T_J, Maximum 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 RESISTANCE

Parameter		Symbol	Min	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		-	-	80	
Thermal Resistance Junction to Case		$R_{\theta JC}$	-	-	30	

ELECTRICAL CHARACTERISTICS

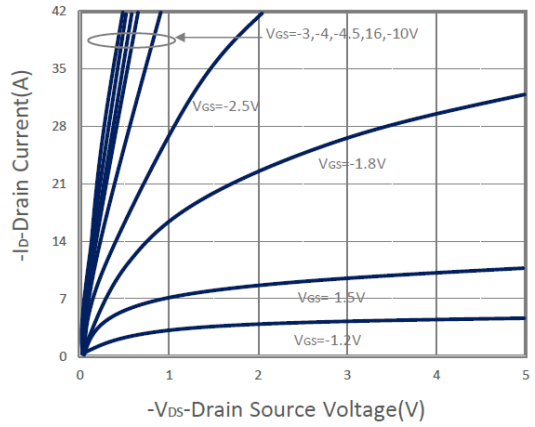
T_A = 25°C, unless otherwise noted

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_{DS}=-250μA	-20	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_{DS}=-250μA	-0.4	-0.6	-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_{DS}=-10.7A	-	12	15	mΩ
		V_{GS}=-4.5V, I_{DS}=-8A	-	14	17	
		V_{GS}=-2.5V, I_{DS}=-5A	-	18	22	
		V_{GS}=-1.8V, I_{DS}=-3A	-	23	28	
Forward Transconductance	G_{fs}	V_{DS}=-10V, I_D=-10A	-	33	-	S
Diode Characteristics						
Diode Forward Voltage NOTE5	V_{SD}	I_S=-1A, V_{GS}=0V	-	-0.7	-1	V
Continuous Source Current	I_S		-	-	-5.2	A
Reverse Recovery Time	t_{rr}	I_S=10A, dI/dt=100A/μs	-	16.8	-	ns
Reverse Recovery Charge	Q_{rr}		-	8	-	nC
Dynamic and Switching Parameters						
Total Gate Charge(10V)	Q_g	V_{DS}=-10V, V_{GS}=-4.5V, I_{DS}=-5A	-	39	54	nC
Total Gate Charge(4.5V)	Q_g		-	19	26.6	
Gate-Source Charge	Q_{gs}		-	2.1	2.9	
Gate-Drain Charge	Q_{gd}		-	3.8	5.3	
Input Capacitance	C_{iss}	V_{DS}=-10V, V_{GS}=0V, f=1MHz	-	1680	-	pF
Output Capacitance	C_{oss}		-	228	-	
Reverse Transfer Capacitance	C_{rss}		-	115	-	
Turn-On Time	$t_{d(on)}$	V_{DD}=-10V, V_{GEN}=-4.5V, R_G=10Ω, I_D=-1A	-	10	19	ns
	t_r		-	38	72	
Turn-Off Time	$t_{d(off)}$		-	86	163	
	t_f		-	25	48	

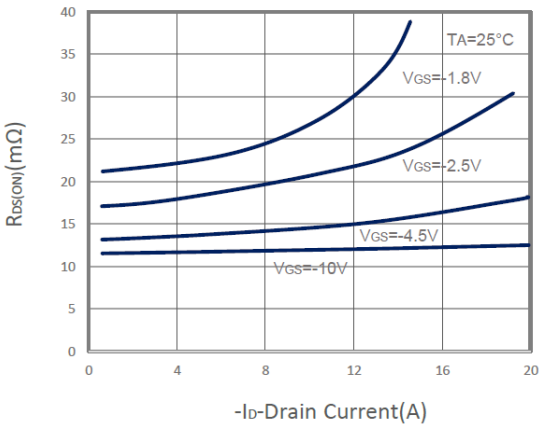
NOTE1: Pulsed width limited by maximum junction temperature $T_{J(MAX)}$=150°C, initial temperature T_J=25°C.
NOTE2: Measure the value in a still air environment at T_A=25 °C using an installation mounted on a 1 in2 FR-4 board.
NOTE3: Current Rating based t≤10 sec thermal resistance rating
NOTE4: The $R_{\theta JA}$ is the sum of the thermal resistance.
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 ELECTRICAL CHARACTERISTICS

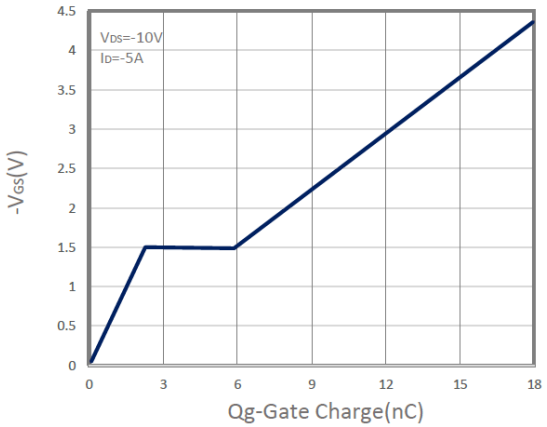
1. Output Characteristics



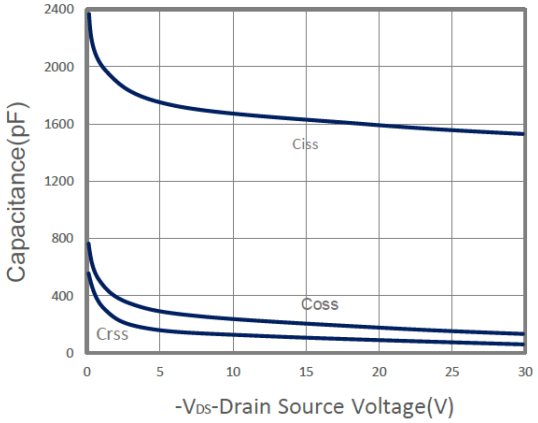
2. Drain-Source On Resistance



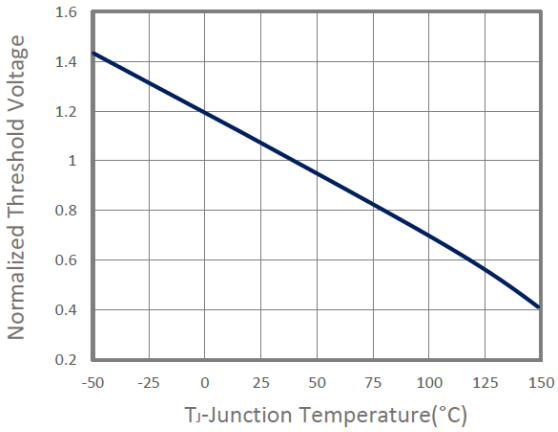
3. Gate Charge



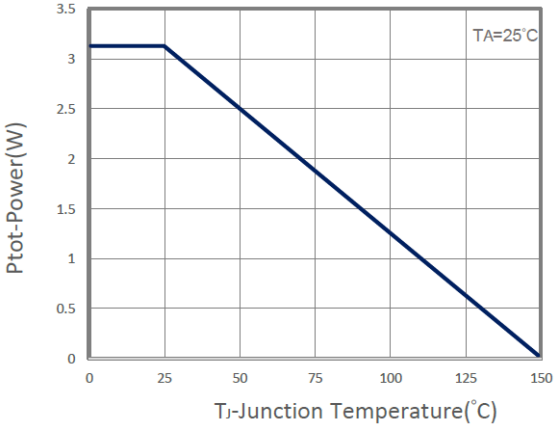
4. Capacitance



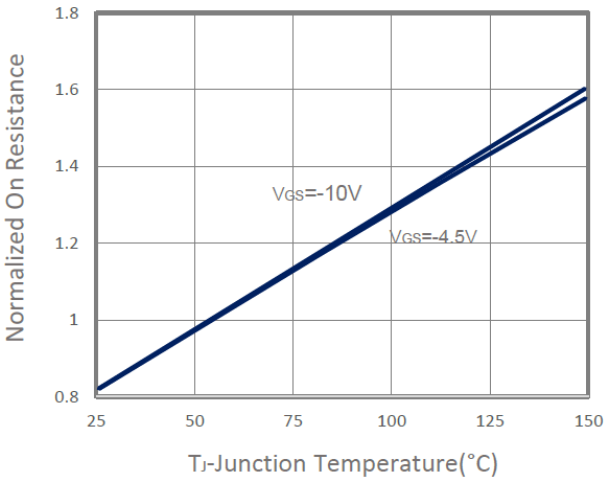
5. Gate Threshold Voltage



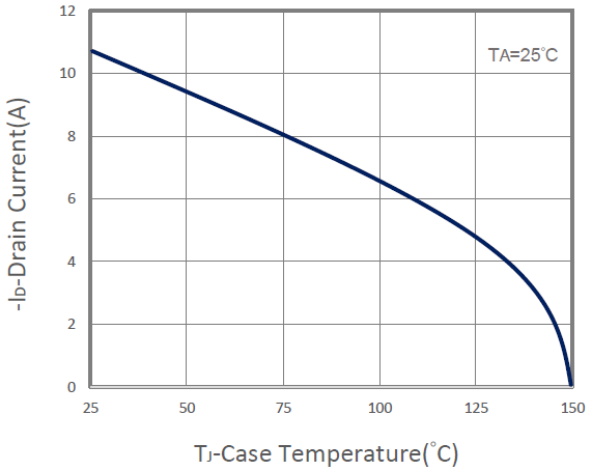
6. Power Dissipation



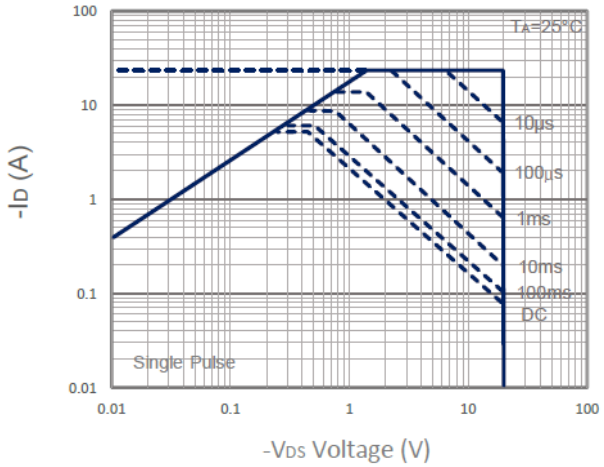
7. $R_{DS(ON)}$ vs. Junction Temperature



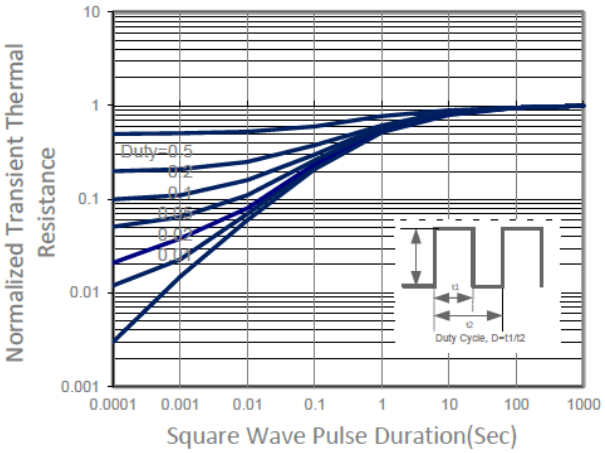
8. Drain Current vs. T_J



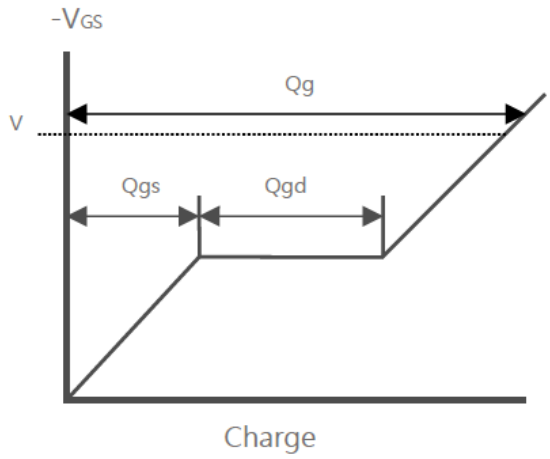
9. Maximum Safe Operation Area



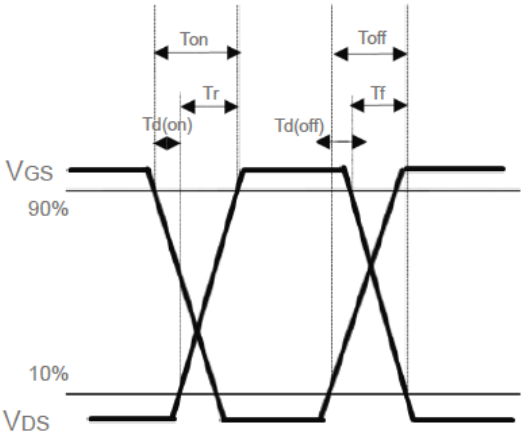
10. Thermal Transient Impedance



11. Gate Chrge Waveform

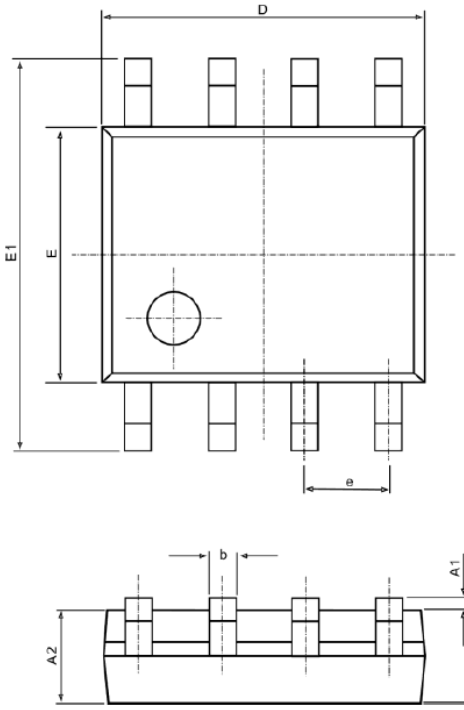


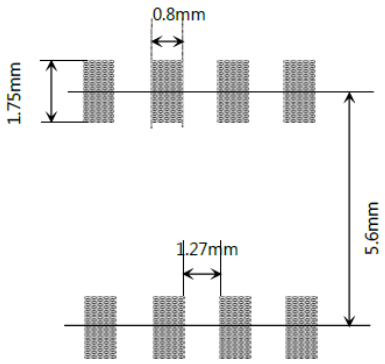
12. Switching Time Waveform



PACKAGE INFORMATION

Dimension in SOP8 Package (Unit: mm)





Recommended Land Pattern

Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270BSC		0.050BSC	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

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