DESCRIPTION

These miniature surface mount MOSFETs utilize a high cell density trench process to provide low $R_{DS(on)}$ and to ensure minimal power loss and heat dissipation. Typical applications are DC-DC converters and power management in portable and battery-powered products such as computers, printers, PCMCIA cards, cellular and cordless telephones.

The AM4501 is available in SOP8 package.

ORDERING INFORMATION

Package Type	Part Number	
SOP8 SPQ: 4,000pcs/Reel	M8	AM4501M8R
		AM4501M8VR
Note	V: Halogen free Package R: Tape & Reel	
AiT provides all RoHS products		

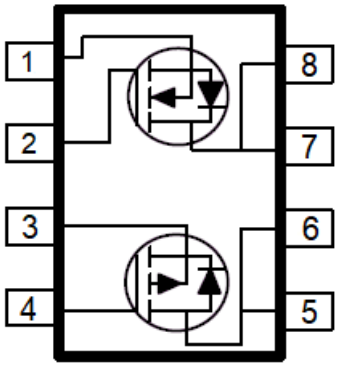
FEATURES

- Low $R_{DS(on)}$ provides higher efficiency and extends battery life
- Low thermal impedance copper leadframe SOP8 saves board space
- Fast switching speed
- High performance trench technology
- Available in SOP8 Package

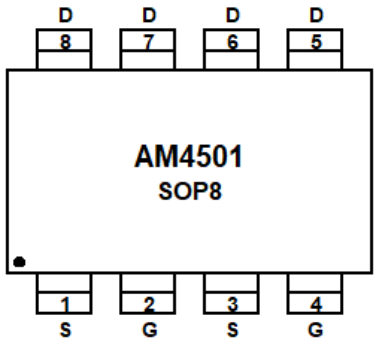
APPLICATIONS

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

TYPICAL APPLICATION



PIN DESCRIPTION



Top View

Pin #	Symbol	Function
1	S	NMOS Source
2	G	NMOS Gate
3	S	PMOS Source
4	G	PMOS Gate
5	D	PMOS Drain
6	D	PMOS Drain
7	D	NMOS Drain
8	D	NMOS Drain

ABSOLUTE MAXIMUM RATINGS

T_A = 25°C, unless otherwise noted

Parameter		N-Channel	P-Channel	Units
V_{DS}, Drain-Source Voltage		30	-30	V
V_{GS}, Gate-Source Voltage		±20	±20	V
I_D, Continuous Drain Current[NOTE1]	T_A = 25°C	10	-9.0	A
	T_A= 70°C	7.8	-6.9	
I_{DM}, Pulsed Drain Current[NOTE2]		40	-35	A
I_S, Continuous Source Current (Diode Conduction)[NOTE1]		3.3	-2.1	A
P_D, Power Dissipation[NOTE1]	T_A = 25°C	2.1	2.1	W
	T_A= 70°C	1.3	1.3	
T_J, T_{STG}, Operating Junction and Storage Temperature Range		−55°C ~ +150°C		°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
Maximum Junction-to-Ambient[NOTE1]	t≦10s	$R_{\theta JA}$	-	-	62.5	°C/W
	Steady-State		-	-	110	

NOTE1: Surface Mounted on 1” x 1” FR4 Board.
NOTE2: Pulse width limited by maximum junction temperature

ELECTRICAL CHARACTERISTICS

T_A = 25°C, unless otherwise noted

Parameter	Symbol	Conditions	Limits				Units
			Ch	Min	Typ	Max	
Static							
Gate-Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_{DS}=250μA	N	1	-	3	V
		V_{GS}=V_{DS}, I_{DS}=-250μA	P	-1	-	-3	
Gate-Body Leakage	I_{GSS}	V_{GS}=-20V, V_{DS}=0V	P	-	-	±1000	nA
		V_{GS}=20V, V_{DS}=0V	N	-	-	±1000	
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-24V, V_{GS}=0V	P	-	-	-1	μA
		V_{DS}=24V, V_{GS}=0V	N	-	-	1	
On-State Drain Current[NOTE3]	$I_{D(on)}$	V_{DS}=5V, V_{GS}=10V	N	40	-	-	A
		V_{DS}=-5V, V_{GS}=-10V	P	-35	-	-	
Drain-source On-Resistance[NOTE3]	$R_{DS(ON)}$	V_{GS}=10V I_{DS}=7.1A	N	-	11	16	mΩ
		V_{GS}=4.5V, I_{DS}=5.8A		-	16	22	
		V_{GS}=-10V I_{DS}=-6A	P	-	21	26	
		V_{GS}=-4.5V, I_{DS}=-4.9A		-	32	39	
Forward Tranconductance[NOTE3]	G_{fs}	V_{DS}=15V, I_D=6.9A	N	-	13	-	S
		V_{DS}=-15V, I_D=-5.2A	P	-	8	-	
Dynamic[NOTE4]							
Total Gate Charge	Q_g	N-Channel	N	-	16	-	nC
		V_{DS}=15V, V_{GS}=10V,	P	-	19	-	
Gate-Source Charge	Q_{gs}	I_D=6.9A	N	-	4.9	-	
		P-Channel	P	-	4.7	-	
Gate-Drain Charge	Q_{gd}	V_{DS}=-15V, V_{GS}=-10V,	N	-	3.5	-	
		I_D=-5.2A	P	-	7.7	-	
Turn-On Delay Time	$t_{d(on)}$	N-Channel	N	-	6	-	ns
			P	-	6	-	
Rise Time	t_r	V_{DD}=15V, V_{GS}=10V,	N	-	6	-	
		I_D=1A, R_{GEN}=6Ω	P	-	5	-	
Turn-Off Delay Time	$t_{d(off)}$	P-Channel	N	-	29	-	
		V_{DD}=-15V, V_{GS}=-10V,	P	-	53.6	-	
Fall-Time	t_f	I_D=-1A, R_{GEN}=6Ω	N	-	8	-	
			P	-	21	-	

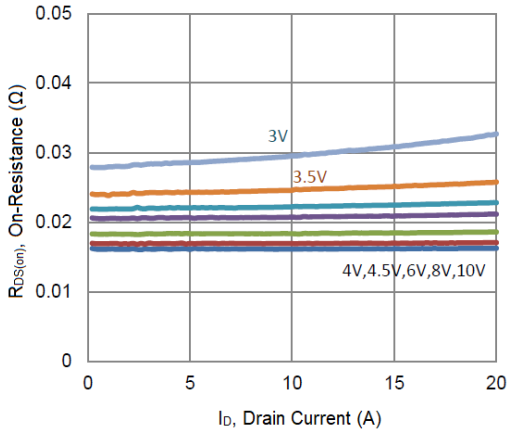
NOTE3: Pulse test: Pulse Width ≦ 300us duty cycle ≦ 2%.

NOTE4: Guaranteed by design, not subject to production testing.

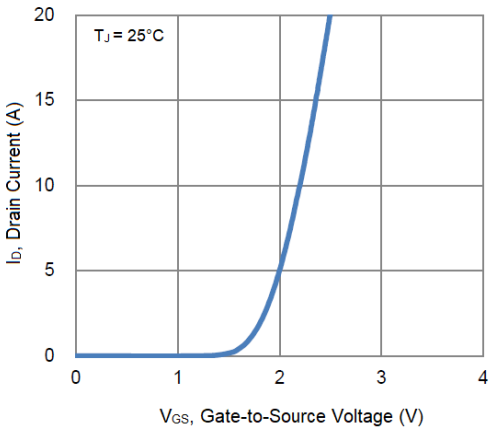
TYPICAL ELECTRICAL CHARACTERISTICS

P-Channel

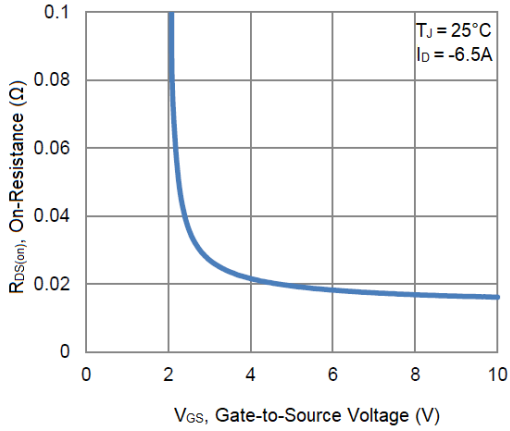
1. On-Resistance vs. Drain Current



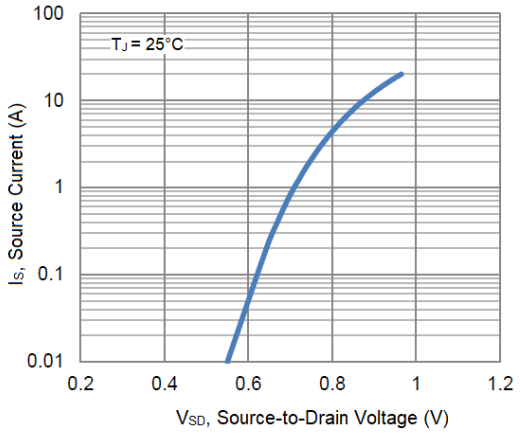
2. Transfer Characteristics



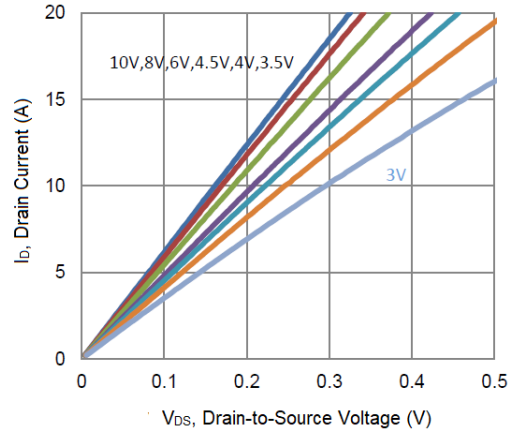
3. On-Resistance vs. Gate-to-Source Voltage



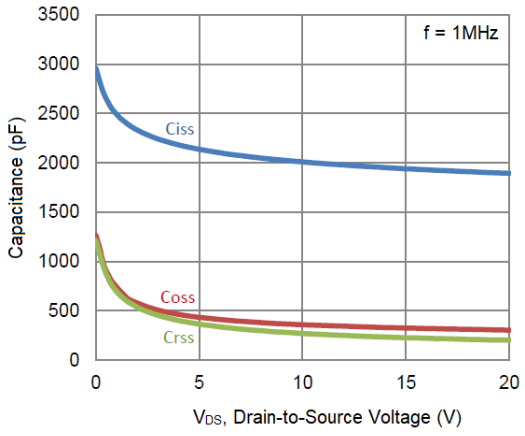
4. Drain-to-Source Forward Voltage



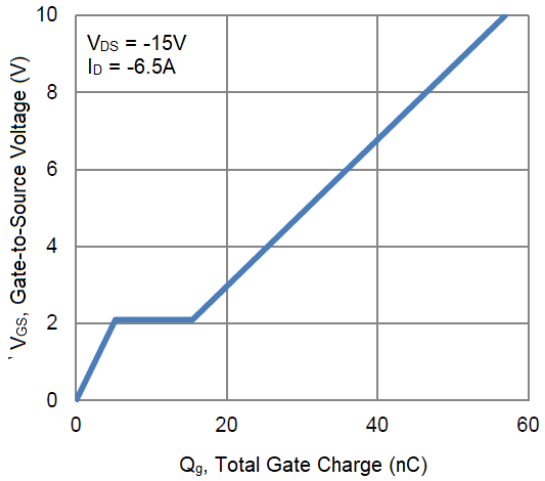
5. Output Characteristics



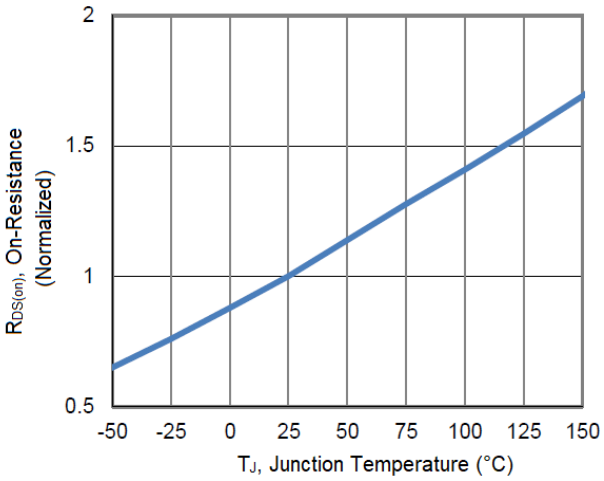
6. Capacitance



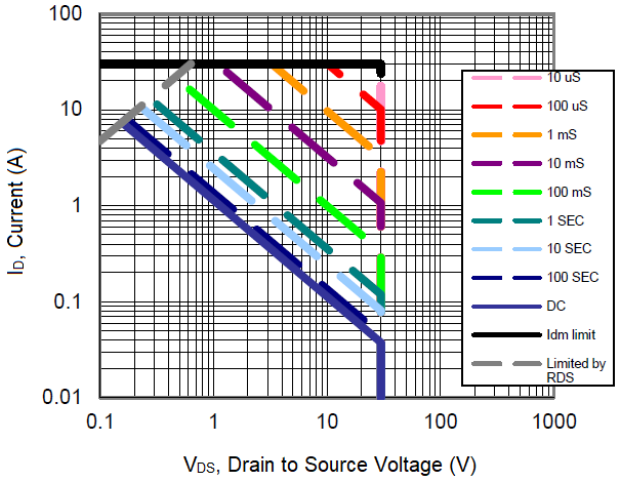
7. Gate Charge



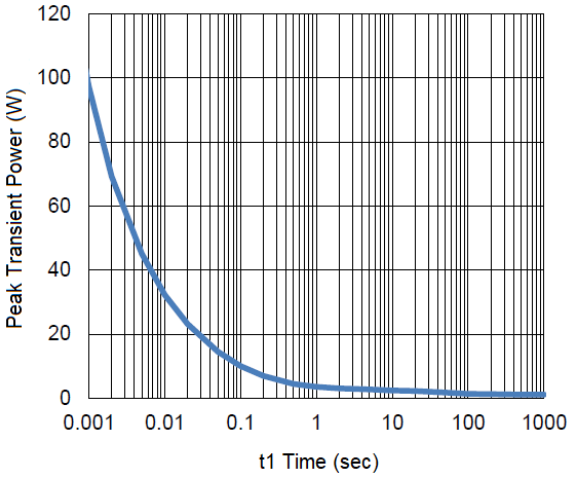
8. Normalized On-Resistance vs. Junction Temperature



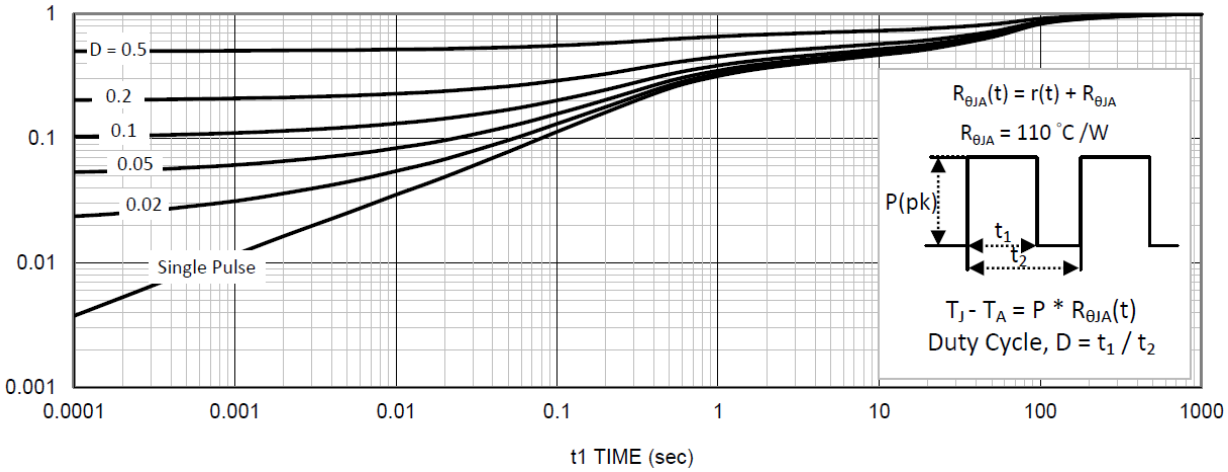
9. Safe Operating Area



10. Single Pulse Maximum Power Dissipation

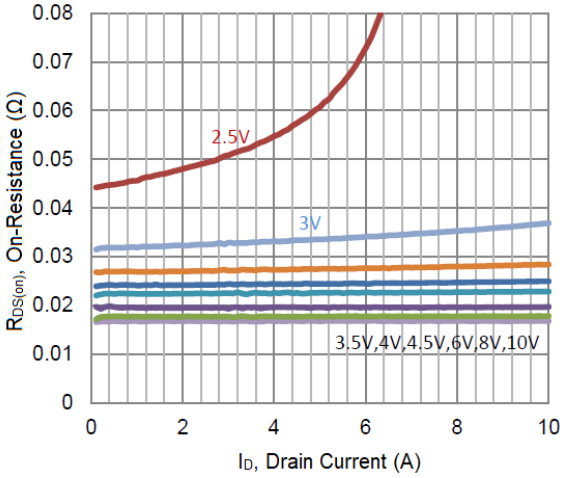


11. Normalized Thermal Transient Junction to Ambient

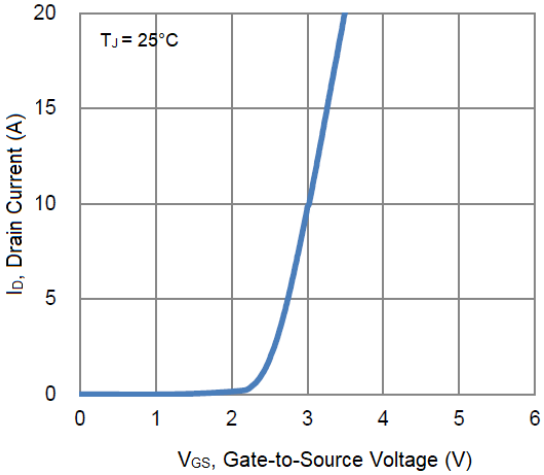


N-Channel

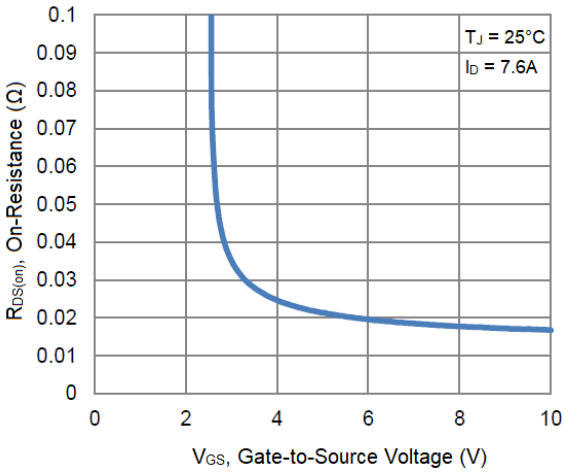
12. On-Resistance vs. Drain Current



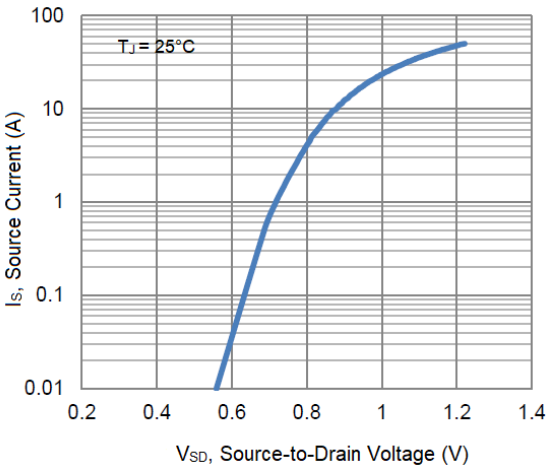
13. Transfer Characteristics



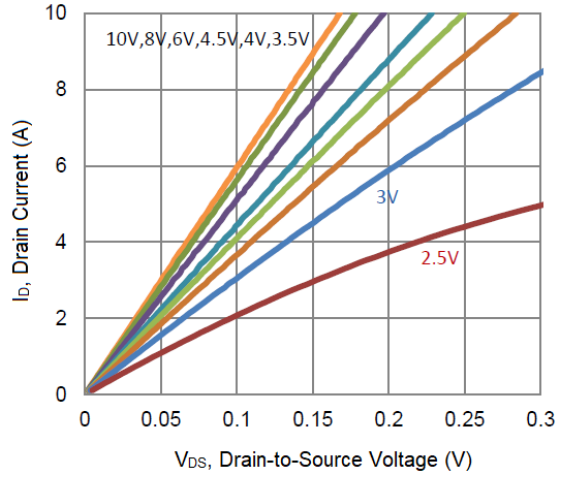
14. On-Resistance vs. Gate-to-Source Voltage



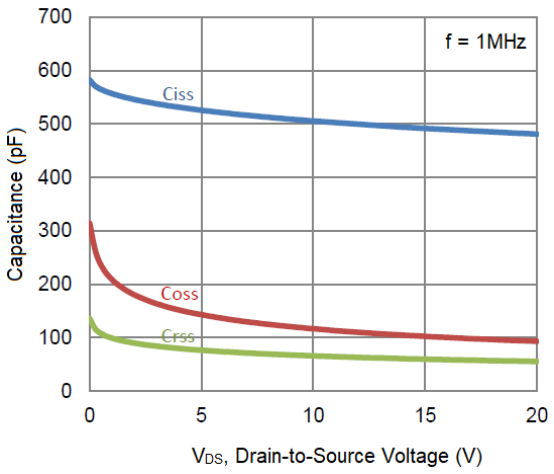
15. Source-to-Drain Forward Voltage



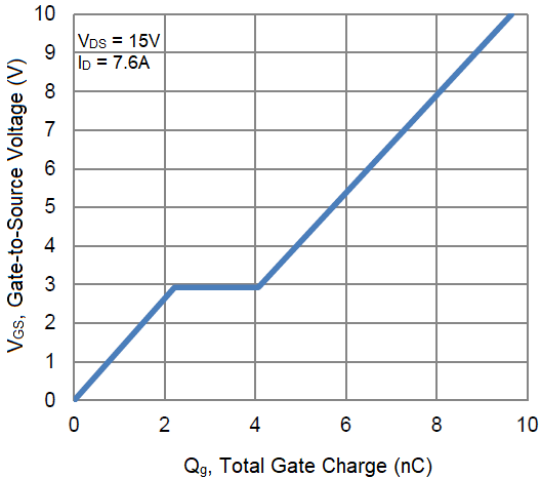
16. Output Characteristics



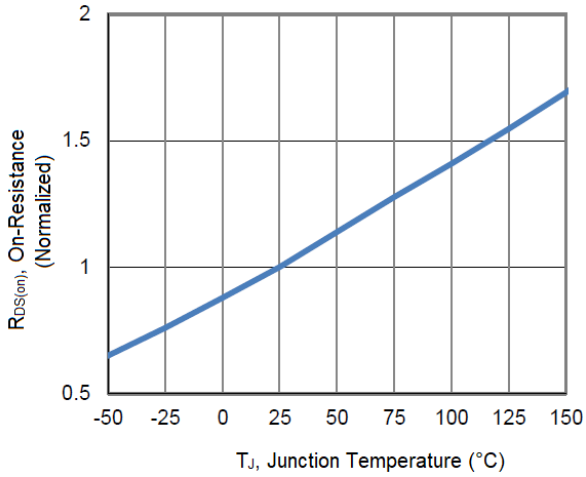
17. Capacitance



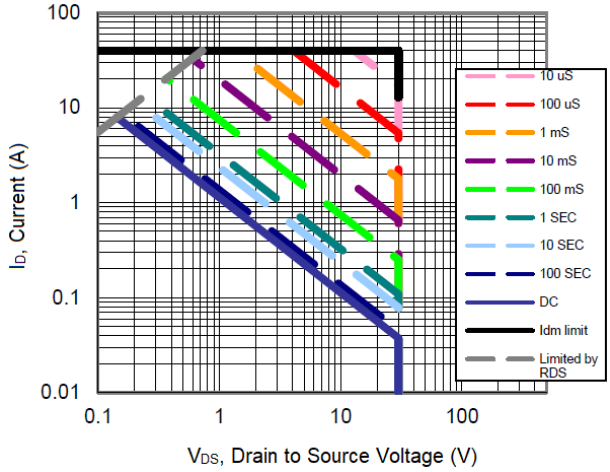
18. Gate Charge



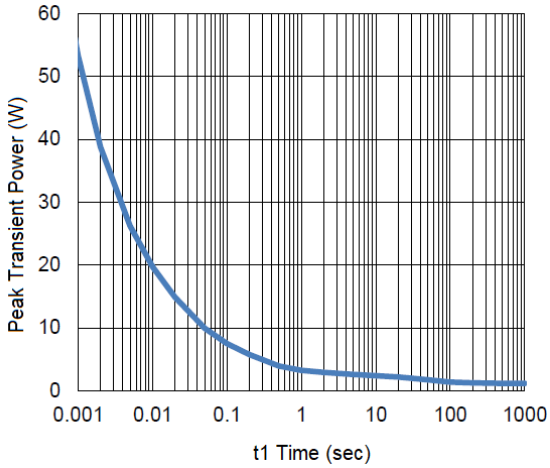
19. Normalized On-Resistance vs. Junction Temperature



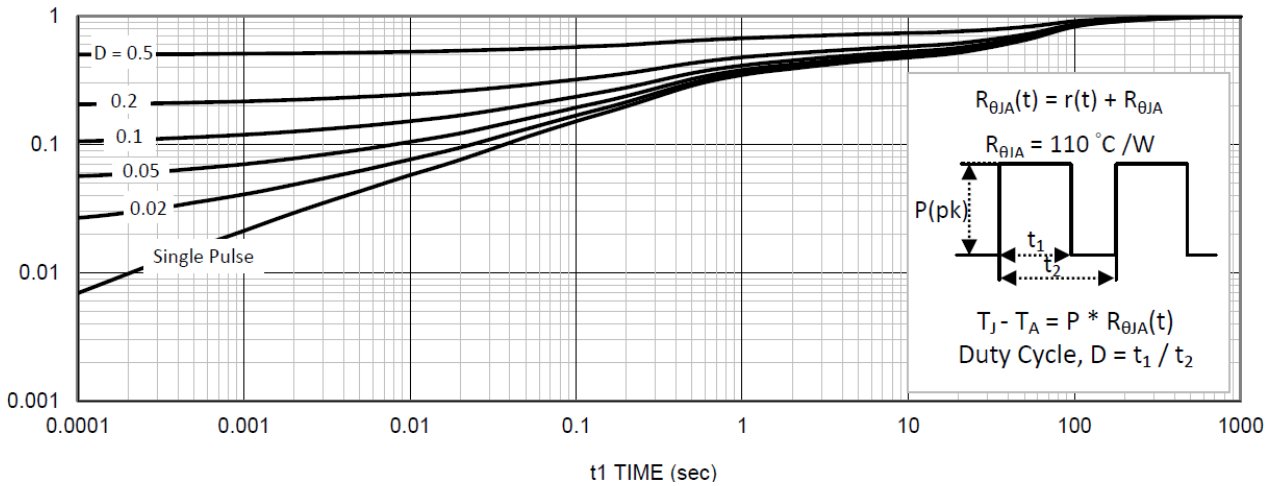
20. Safe Operating Area



21. Single Pulse Maximum Power Dissipation



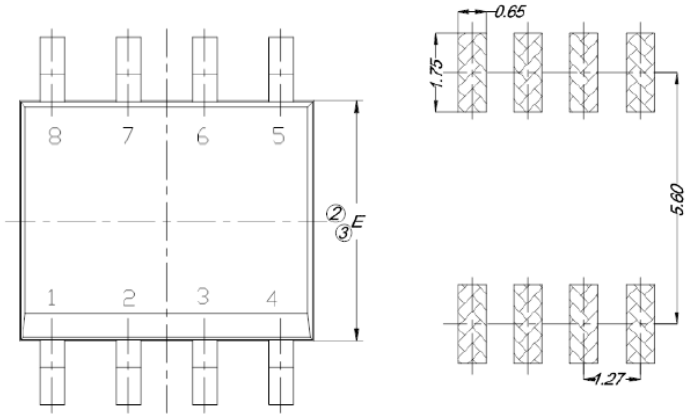
22. Normalized Thermal Transient Junction to Ambient

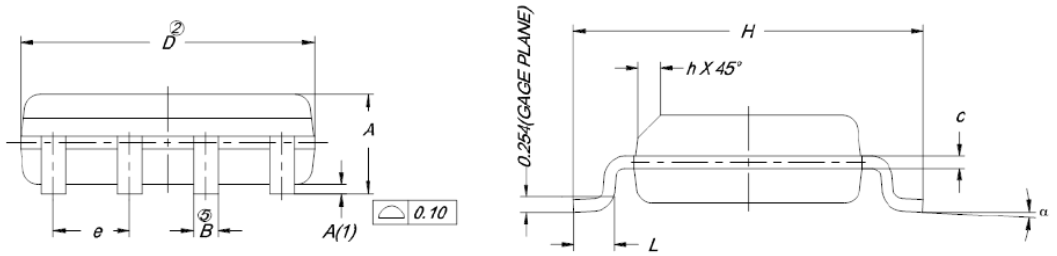


PACKAGE INFORMATION

Dimension in SOP8 Package (Unit: mm)

Land Pattern (Only for Reference)





Symbol	Min.	Max.
A	1.35	1.75
A(1)	0.10	0.25
B	0.38	0.51
C	0.19	0.25
D	4.80	5.00
E	3.80	4.00
e	1.27 BSC	
H	5.80	6.20
L	0.50	0.93
α	0°	8°
h	0.25	0.50

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