N-Channel Enhancement Mode MOSFET

GENERAL DESCRIPTION

The PW3428 uses advanced trench technology to provide excellent RDS(ON), low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

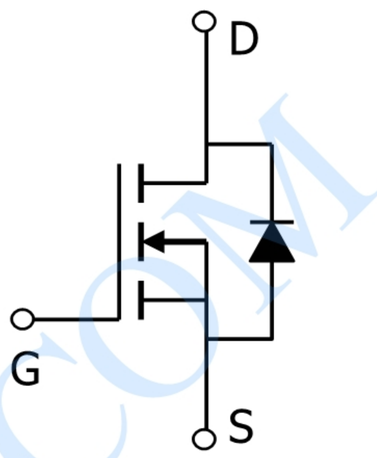
FEATURES

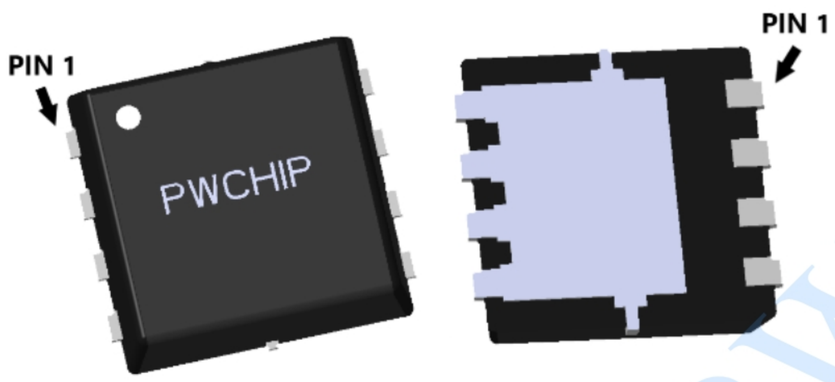
VDS ： 30V

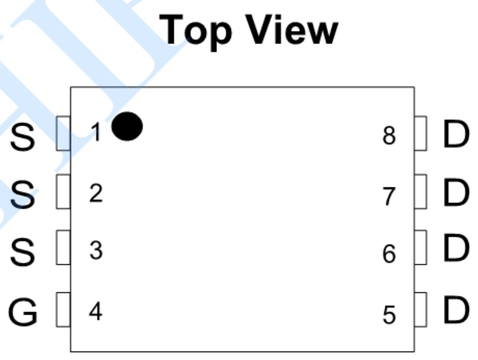
ID ： 28A

RDS(ON) ： Typ 15mΩ @ VGS=10V

Available in a 8-Pin DFN3*3 Package







DFN3*3-8L

Absolute Maximum Ratings (TA=25℃unless otherwise noted)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current, V_{GS} @ 10V (NOTE1)	ID@TC=25℃	28	A
Continuous Drain Current, V_{GS} @ 10V (NOTE1)	ID@TC=100℃	12	A
Pulsed Drain Current (NOTE2)	I_{DM}	50	A
Total Power Dissipation (NOTE3)	P_D @TC=25℃	20.8	W
Total Power Dissipation (NOTE3)	P_D @TA=25℃	2	W
Storage Temperature Range	T_{STG}	-55 To 150	℃
Operating Junction Temperature Range	T_J	-55 To 155	℃
Single pulse avalanche energy (NOTE4)	E_{AS}	8.1	mJ
Avalanche Current	IAS	12.7	A
Thermal Resistance Junction-Case (NOTE1)	$R_{\theta JC}$	3.8	℃/W
Thermal Resistance Junction-ambient (NOTE1)	$R_{\theta JA}$	62	℃/W

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ELECTRICAL CHARACTERISTICS(TJ = 25°C, unless otherwise noted.)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	VGS=0V ID=250μA	30	32		V
BVDSS Temperature Coefficient	$\triangle BV_{DSS}/\triangle T_J$	Reference to 25℃ , ID=1mA		0.023		V/℃
Drain-Source Leakage Current	I_{DSS}	VDS=20V,VGS=0V TJ=25℃			1	μA
Drain-Source Leakage Current	I_{DSS}	VDS=20V,VGS=0V TJ=55℃			5	μA
Gate- Source Leakage Current	I_{GSS}	VGS=±20V,VDS=0V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	VDS=VGS,ID=250μA	0.5	0.65	1.2	V
$V_{GS(th)}$ Temperature Coefficient	$\triangle V_{GS(th)}$	VDS=VGS,ID=250μA		-4.2		mV/℃
Static Drain-Source On-Resistance (NOTE2)	$R_{DS(ON)}$	VGS=4.5V, ID=8A		28.5	38	mΩ
Static Drain-Source On-Resistance (NOTE2)	$R_{DS(ON)}$	VGS=10V, ID=10A		15	25	mΩ
Forward Transconductance	g_{FS}	VDS=5V,ID=10A		5.5		S
Gate Resistance	Rg	VDS=0V , VGS=0V , f=1MHz		2.3		Ω
Total Gate Charge （4.5V）	Qg	VGS=4.5V,VDS=15V,ID=10A		4.9		nC
Gate-Source Charge	Qgs			1.66		nC
Gate-Drain Charge	Qgd			1.85		nC
Turn-on Delay Time	td(on)	VGS=10V,VDD=15V RG=3. 3Ω,ID=10A		1.5		nS
Turn-on Rise Time	tr			15.8		nS
Turn-Off Delay Time	td(off)			13		nS
Turn-Off Fall Time	tf			4.8		nS
Diode Forward Voltage (Note 2)	VSD	VGS=0V,IS=1A TJ=25℃			1.2	V
Continuous Source Current(NOTE1,5)	IS	VG=VD=0V , Force Current			24	A
Pulsed Source Current(NOTE2,5)	ISM	VG=VD=0V , Force Current			50	A
Reverse Recovery Time	trr	TJ = 25°C, IF = 10A di/dt = 100A/μs(Note3)		8.7		nS
Reverse Recovery Charge	Qrr			1.95		nC
Input Capacitance	Ciss	VDS=15V,VGS=0V, F=1.0MHz		216		PF
Output Capacitance	Coss			52		PF
Reverse Transfer Capacitance	Crss			51		PF

Note :

1、 The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.

2、 The data tested by pulsed , pulse width .The EAS data shows Max. rating .

3、 The power dissipation is limited by 150℃ junction temperature

4、 The test condition is V≦ 300us , duty cycle DD=25≦ V,V 2%GS =10V,L=0.1mH,IAS=12.7A

5、 The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation

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Typical Characteristics

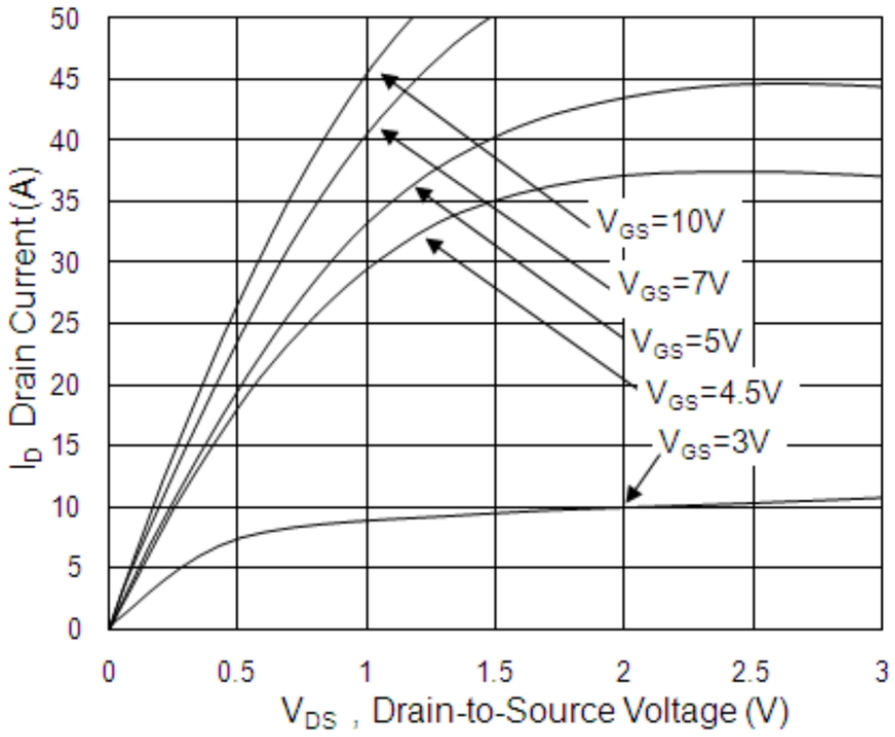

Fig.1 Typical Output Characteristics

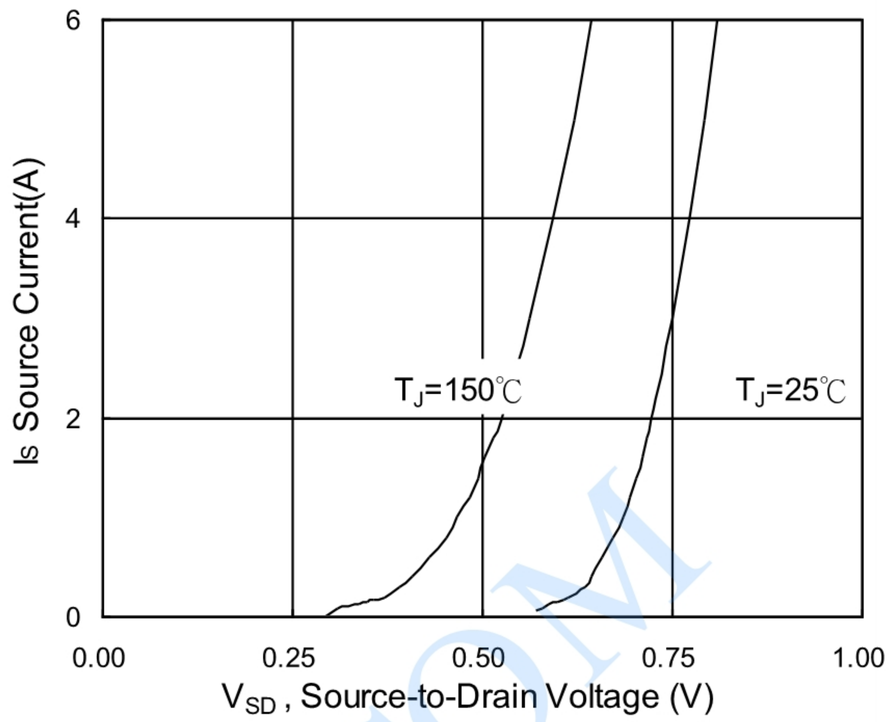

Fig.2 Forward Characteristics Of Reverse

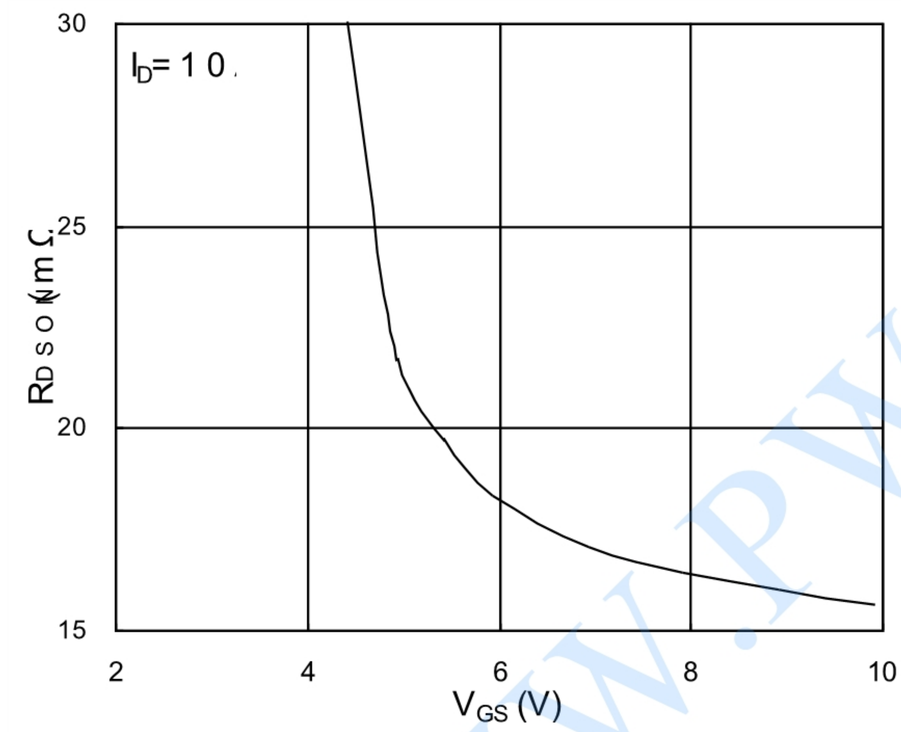

Fig.3 On-Resistance vs. Gate-Source

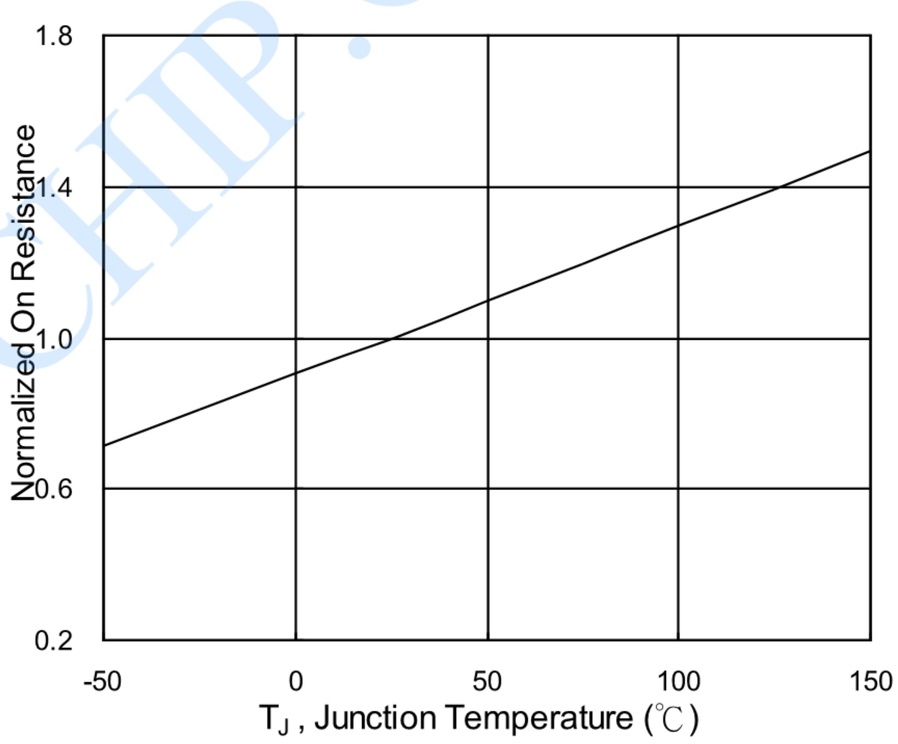

Fig.4 Normalized R_{DSON} vs. T_J

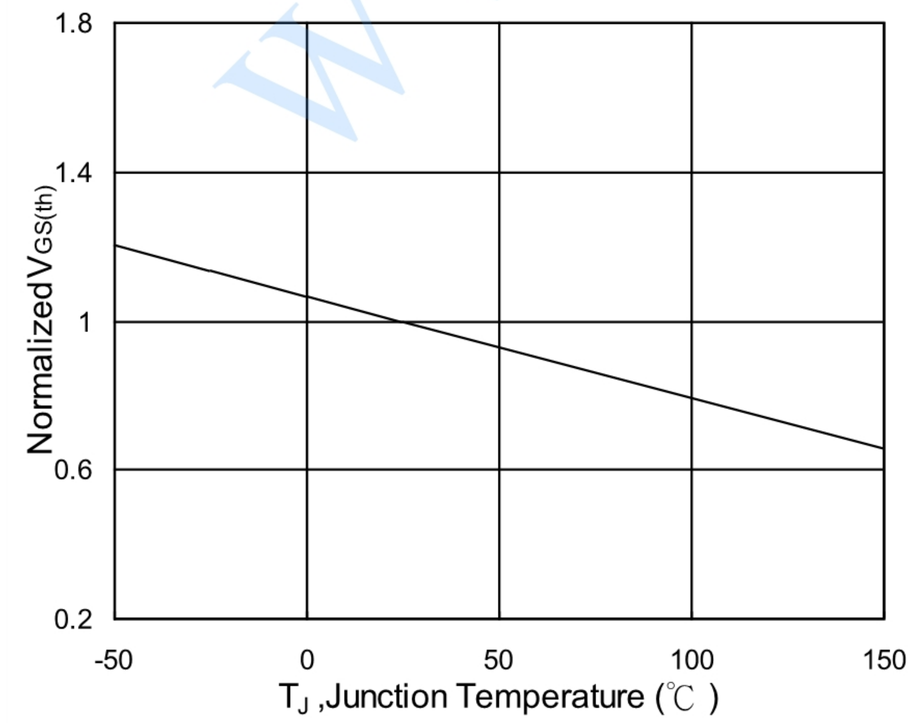

Fig.5 Normalized $V_{GS(th)}$ vs. T_J

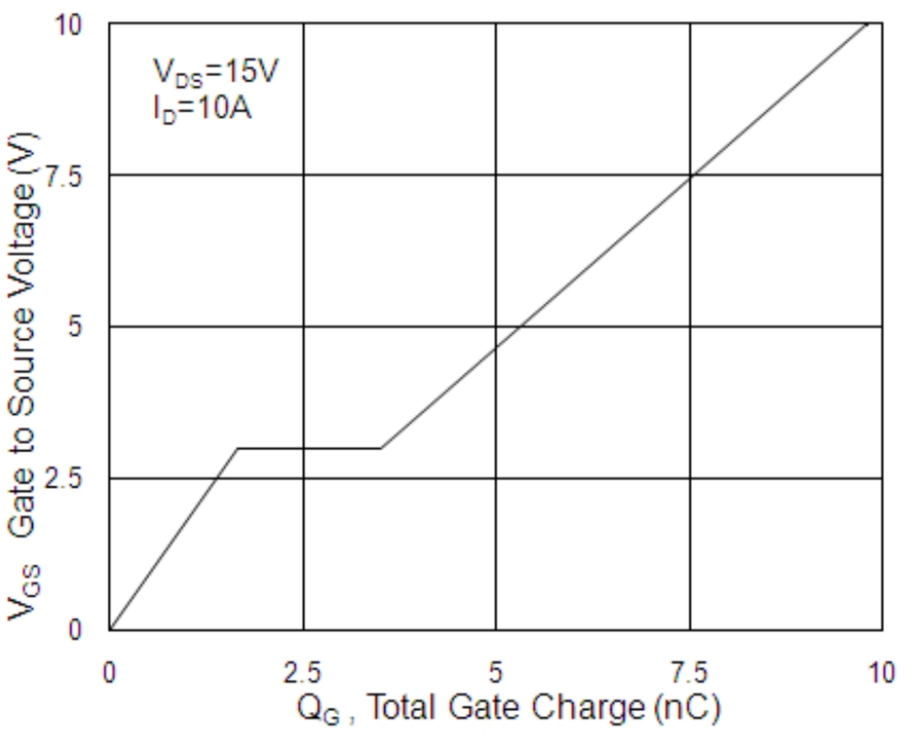

Fig.6 Gate-Charge Characteristics

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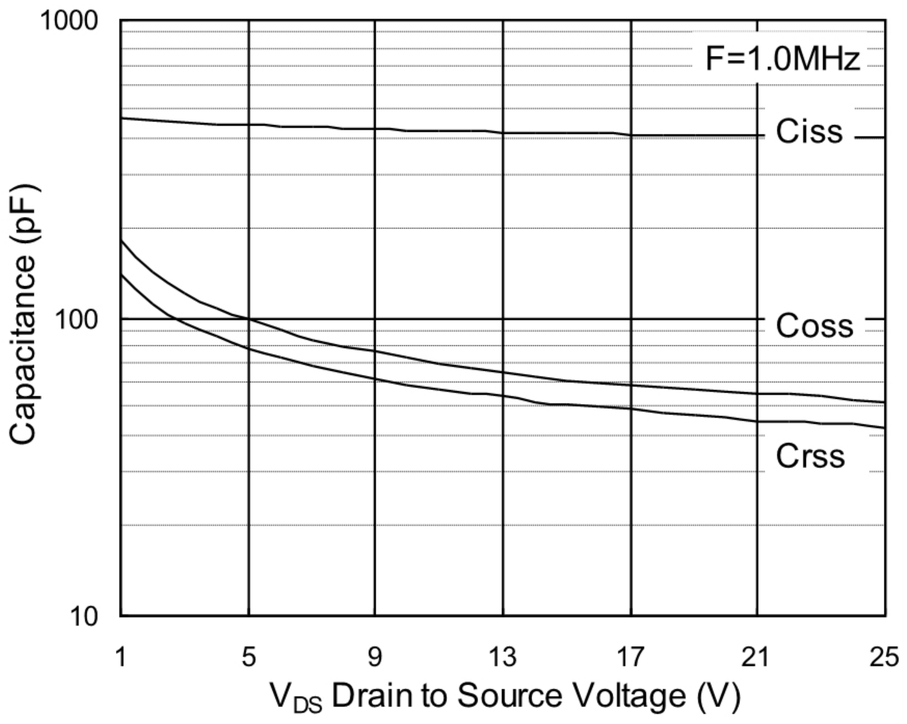

Fig.7 Capacitance

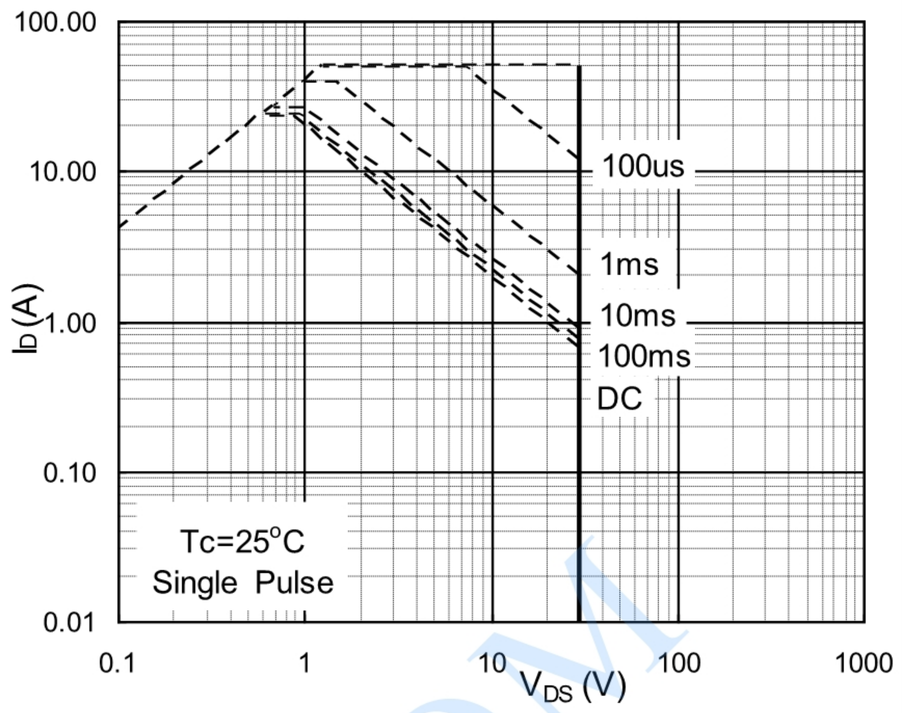

Fig.8 Safe Operating Area

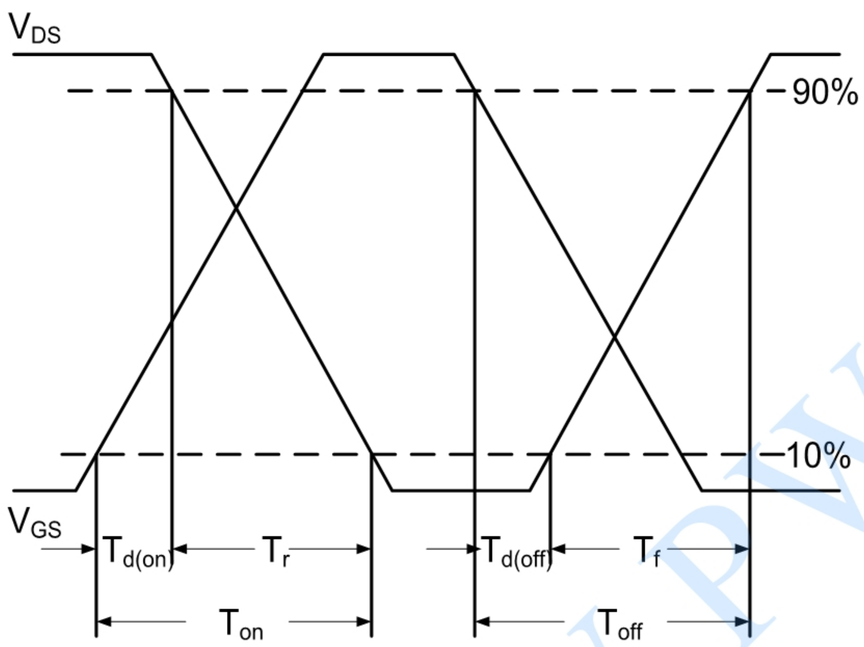

Fig.9 Switching Time Waveform

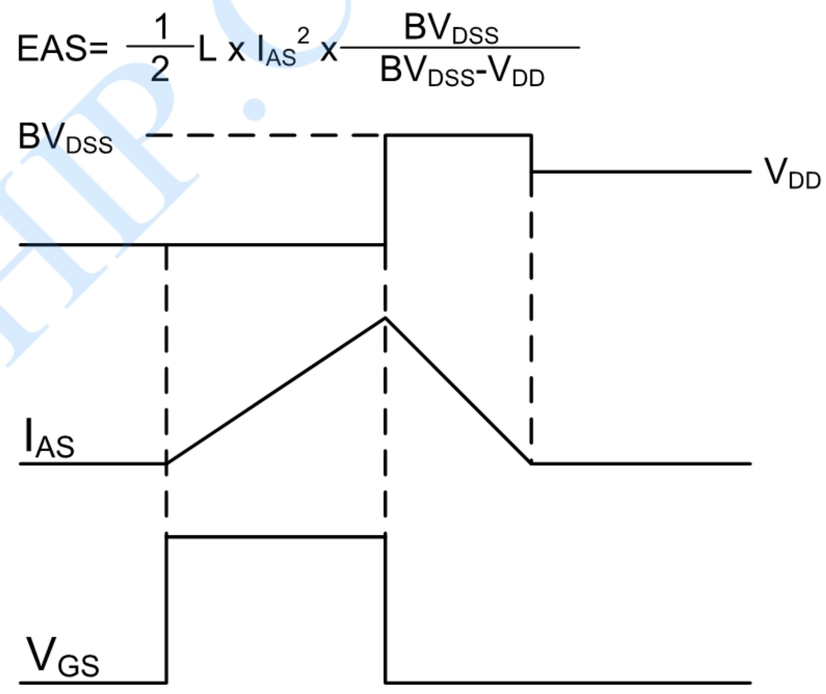

Fig.10 Unclamped Inductive Switching Waveform

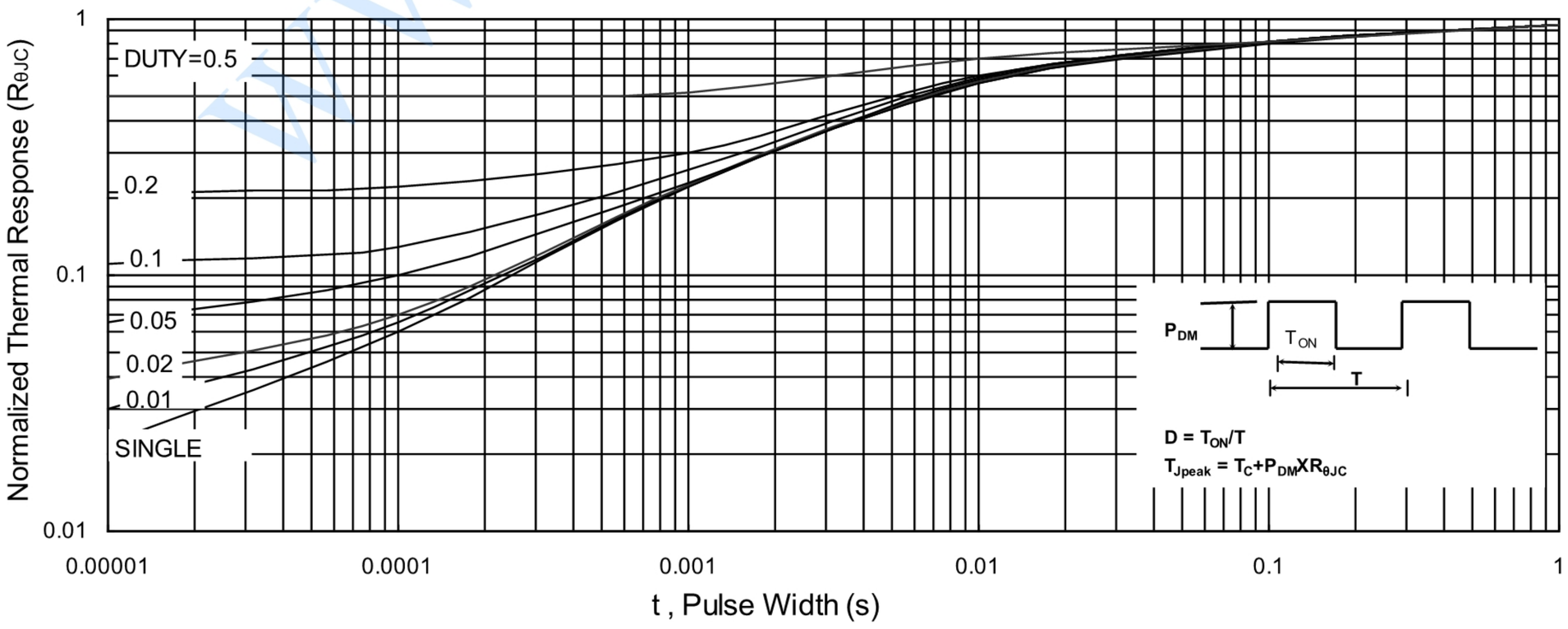

Fig.11 Normalized Maximum Transient Thermal Impedance

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PACKAGE DESCRIPTION

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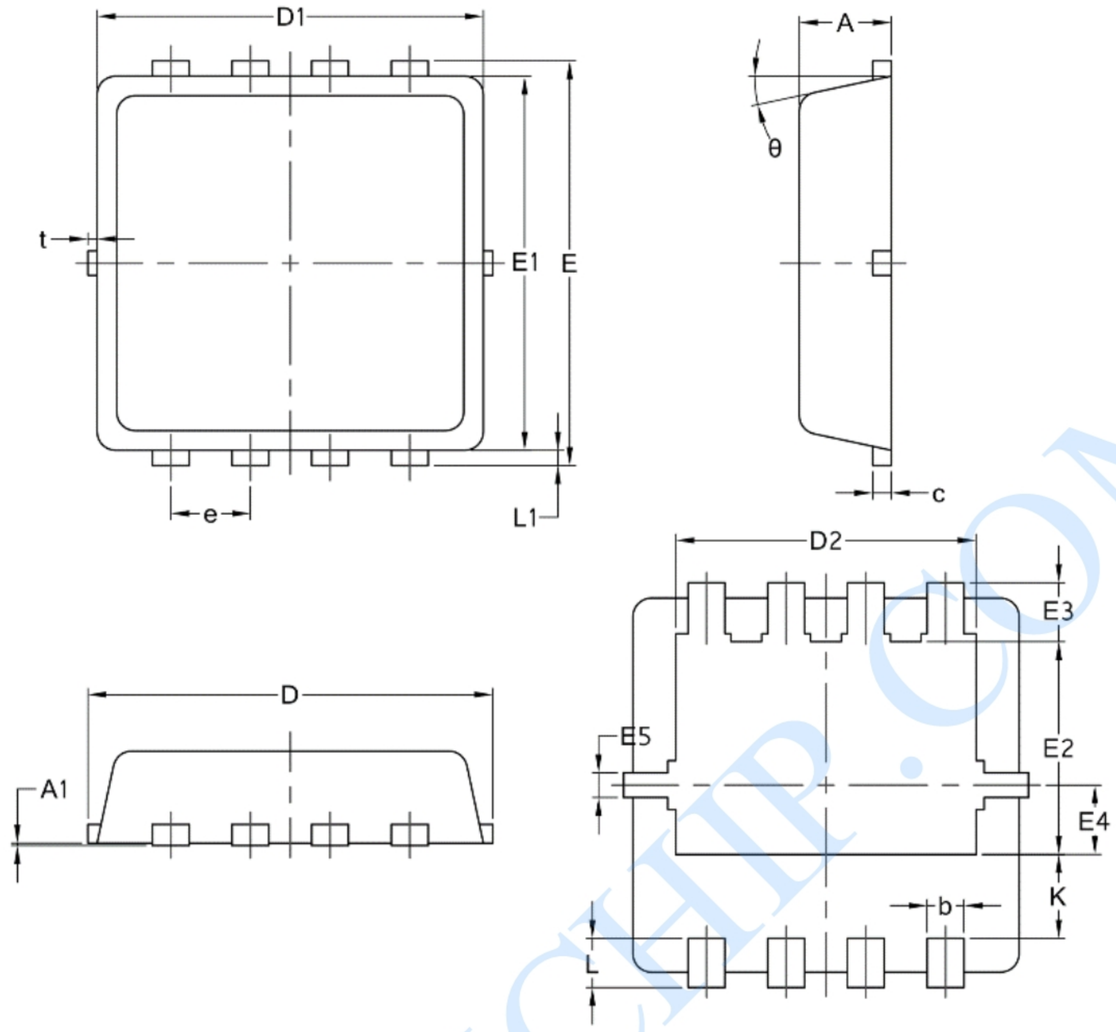

Symbol	Common		
	mm		
	Mim	Nom	Max
A	0.70	0.75	0.85
A1	/	/	0.05
b	0.20	0.30	0.40
c	0.10	0.152	0.25
D	3.15	3.30	3.45
D1	3.00	3.15	3.25
D2	2.29	2.45	2.65
E	3.15	3.30	3.45
E1	2.90	3.05	3.20
E2	1.54	1.74	1.94
E3	0.28	0.48	0.65
E4	0.37	0.57	0.77
E5	0.10	0.20	0.30
e	0.60	0.65	0.70
K	0.59	0.69	0.89
L	0.30	0.40	0.50
L1	0.06	0.125	0.20
t	0	0.075	0.13
Φ	10	12	14

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