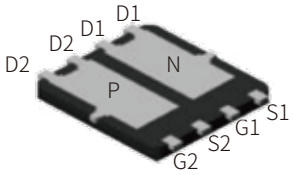
FEATURES

- V_{DS} = 30V I_D =38A
- $R_{DS(ON)}$ < 8.5mΩ @ V_{GS}=10V (Type:6mΩ)
- V_{DS} = -30V I_D =-35A
- $R_{DS(ON)}$ < 10mΩ @ V_{GS}=-10V (Type: 7.5mΩ)



PDFN5×6-8L

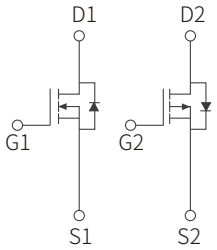
Marking

APPLICATION

- BLDC

APPROVALS

RoHS	Compliance with 2011/65/EU
HF	Compliance with IEC61249-2-21:2003



Schematic Symbol

ABSOLUTE MAXIMUM RATINGS(T_a=25°C)

Parameter		Symbol	Value		Unit
			N-channel	P-channel	
Drain-Source Voltage		V_{DS}	30	-30	V
Gate-Source Voltage		V_{GS}	±20	±20	V
Continuous Drain Current, V_{GS} @ 10V[1]	T_A=25°C	I_D	38	-35	A
	T_A=70°C		21	-18.1	A
Pulsed Drain Current[2]		I_{DM}	90	-85	A
Single Pulse Avalanche Energy[3]		EAS	22	22	mJ
Avalanche Current		I_{AS}	28	23	A
Total Power Dissipation[4]	T_A=25°C	P_D	46	46	W
Operating Junction and Storage Temperature Range		T_J,T_{STG}	-55 to 150		°C
Thermal Resistance Junction-Ambient [1]		$R_{\theta JA}$	62.5		°C/W
Thermal Resistance Junction-Case[1]		$R_{\theta JC}$	60		°C/W

ELECTRICAL CHARACTERISTICS(T_a=25°C)

N-Channel

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_D=250μA	30	33		V
BV_{DSS} Temperature Coefficient	$\triangle BV_{DSS}/\triangle T_J$	Reference to 25°C , I_D=1mA		0.0193		V/°C
Drain-Source Leakage Current	I_{DSS}	V_{DS}=30V,V_{GS}=0V,T_J=25°C			1	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	1.2	1.6	2.5	V
$V_{GS(th)}$ Temperature Coefficient	$\triangle V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA		-3.97		mV/°C
Static Drain-to-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V,I_D=40A		6	8.5	mΩ
		V_{GS}=4.5V,I_D=1A		9	13	
Forward Transconductance	gfs	V_{DS}=5V,I_D=30A		34		S
Gate Resistance	R_g	V_{DS}=0V , V_{GS}=0V , f=1MHz		1.8		Ω
Input Capacitance	C_{iss}	V_{DS}=15V,V_{GS}=0V,f=1MHz		940		pF
Output Capacitance	C_{oss}			131		
Reverse Transfer Capacitance	C_{rss}			109		
Turn–On Delay Time	$t_{d(on)}$	V_{DD}=15V,V_{GS}=10V R_G=3.3Ω,I_D=15A		4		ns
Turn–On Rise Time	t_r			8		
Turn–Off Delay Time	$t_{d(off)}$			31		
Turn–Off Fall Time	t_f			4		
Total Gate Charge	Q_g	V_{GS}=4.5V,V_{DS}=15V,I_D=15A		9.8		nC
Gate Source Charge	Q_{gs}			4.2		
Gate Drain Charge	Q_{gd}			3.6		
Continuous Source Current[1,5]	I_S	V_G=V_D=0V , Force Current			43	A
Pulsed Source Current[2,5]	I_{SM}				112	A
Diode Forward Voltage[2]	V_{SD}	V_{GS}=0V , I_S=1A , T_J=25°C			1	V
Reverse Recovery Time	t_{rr}	I_F=30A , dI/dt=100A/μs , T_J=25°C		8.5		nS
Reverse Recovery Charge	Q_{rr}			2.2		nC

Note :
1、The data tested by surface mounted on a 1 inch 2 FR-4 board with 2OZ copper.
2、The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3、The EAS data shows Max. rating . The test condition is V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=28A
4、The power dissipation is limited by 175°C junction temperature
5、The data is theoretically the same as I D and I DM , in real applications , should be limited by total power dissipation.

P-Channel

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,I_D=-250μA	-30	-33		V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-30V,V_{GS}=0V			-1	μA
Gate to Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250μA	-1.2	-1.5	-2.5	V
Static Drain-to-Source on-Resistance	$R_{DS(on)}$	V_{GS}=-10V,I_D=-1A		7.5	10	mΩ
		V_{GS}=-4.5V,I_D=-1A		11	14	mΩ
Input Capacitance	C_{iss}	V_{DS}=-15V,V_{GS}=0V,f=1.0MHz		1550		pF
Output Capacitance	C_{oss}			327		
Reverse Transfer Capacitance	C_{rss}			278		
Turn–On Delay Time	$t_{d(on)}$	V_{DD}=-15V,V_{GS}=-10V I_D=-6A,R_{GEN}=2.5Ω		14		ns
Turn–On Rise Time	t_r			20		
Turn–Off Delay Time	$t_{d(off)}$			95		
Turn–Off Fall Time	t_f			65		
Total Gate Charge	Q_g	V_{GS}=-10V,V_{DS}=-15V,I_D=-9.1A		30		nC
Gate Source Charge	Q_{gs}			5.3		
Gate-Drain(“Miller”) Charge	Q_{gd}			7.6		
Maximum Continuous Drain to Source Diode Forward Current	I_S				-10	A
Maximum Pulsed Drain to Source Diode Forward Current	I_{SM}				-40	A
Drain to Source Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_S=-11A		-0.8	-1.2	V

Note :
1、The data tested by surface mounted on a 1 inch 2 FR-4 board with 2OZ copper.
2、The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3、The EAS data shows Max. rating . The test condition is VDD=-25V,VGS=-10V,L=0.1mH,IAS=-5A
4、The power dissipation is limited by 150°C junction temperature
5、The data is theoretically the same as I D and I DM , in real applications , should be limited by total power dissipation.

PARAMETER CHARACTERISTIC CURVE

N-Channel

Figure 1:Output Characteristics

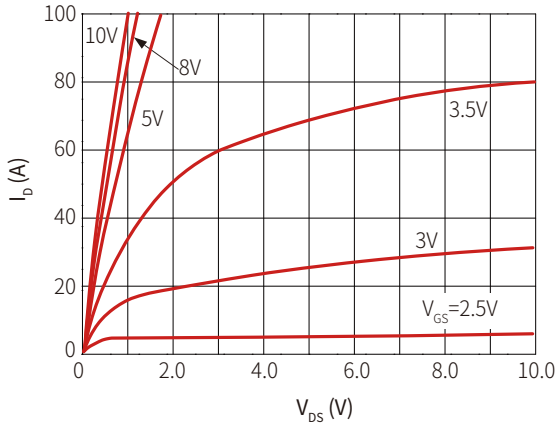


Figure 2:Typical Transfer Characteristics

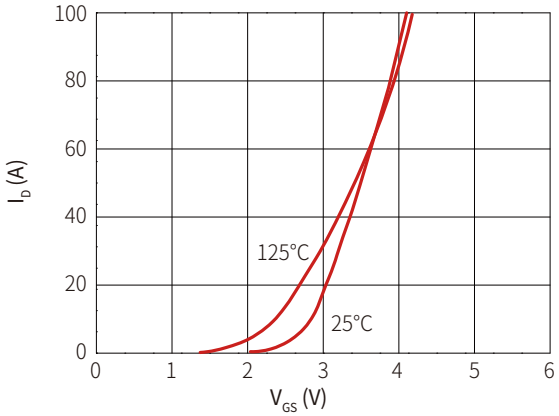


Figure 3:On-resistance vs. Drain Current

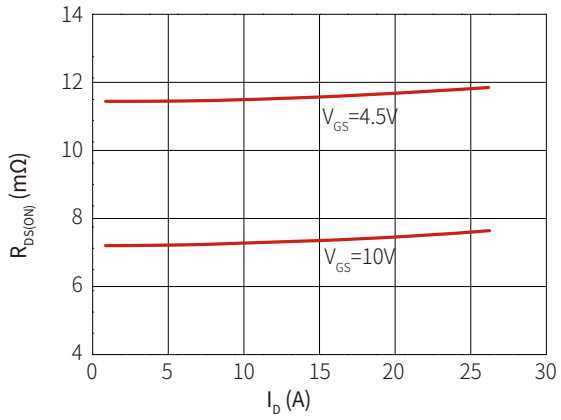


Figure 4:Body Diode Characteristics

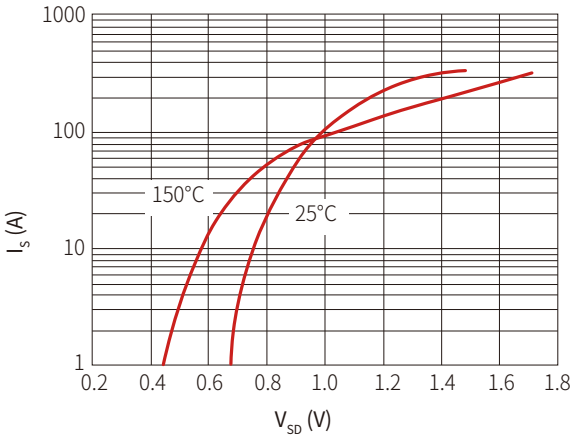


Figure 5:Gate Charge Characteristics

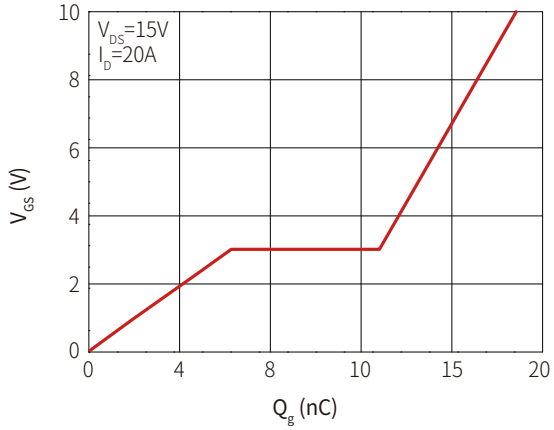


Figure 6:Capacitance Characteristics

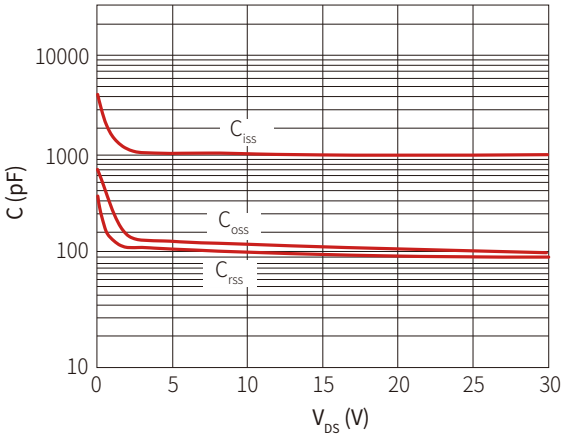


Figure 7：Normalized Breakdown Voltage vs Junction Temperature

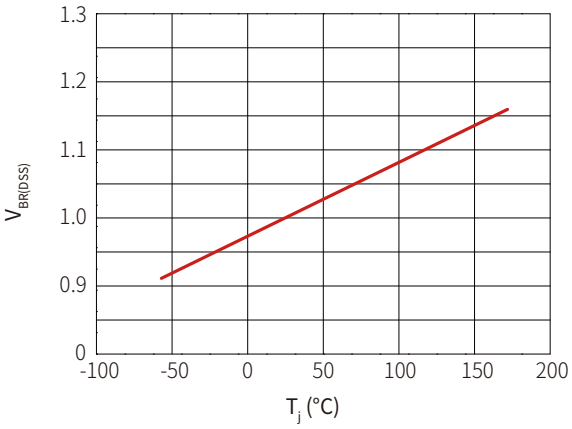


Figure 8：Normalized on Resistance vs Junction Temperature

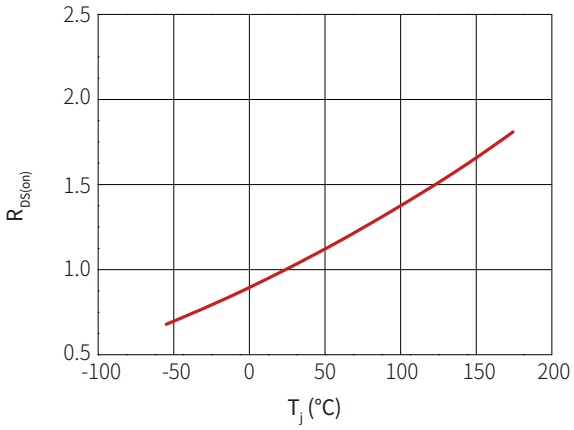


Figure 9：Maximum Safe Operating Area Temperature

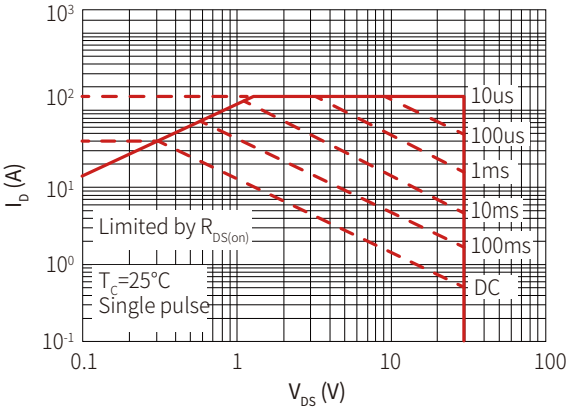


Figure 10：Maximum Continuous Drain Current vs. Ambient

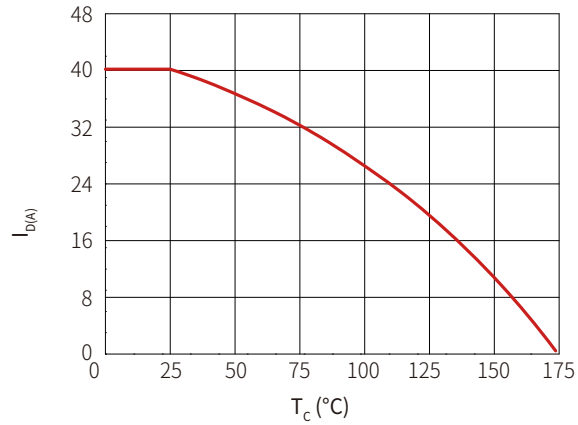
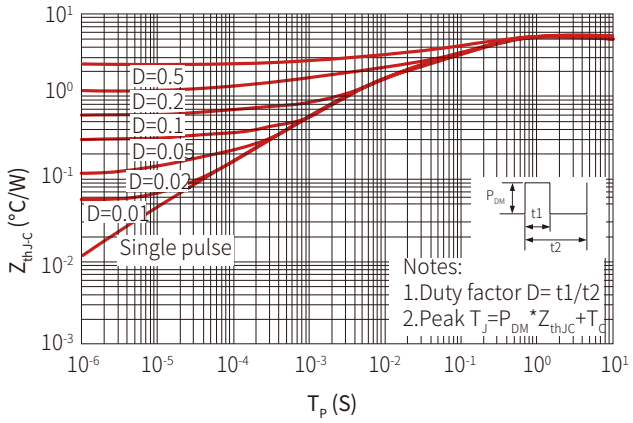


Fig.11 Maximum Effective Transient Thermal Impedance, Junction-to-Ambien



P-Channel

Figure 1: Typical Output Characteristics

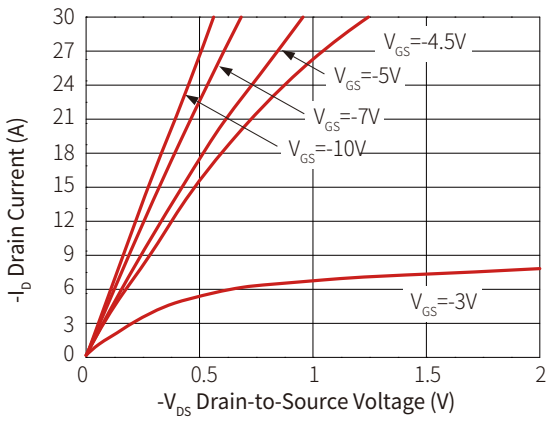


Figure 2: On-Resistance v.s Gate-Source

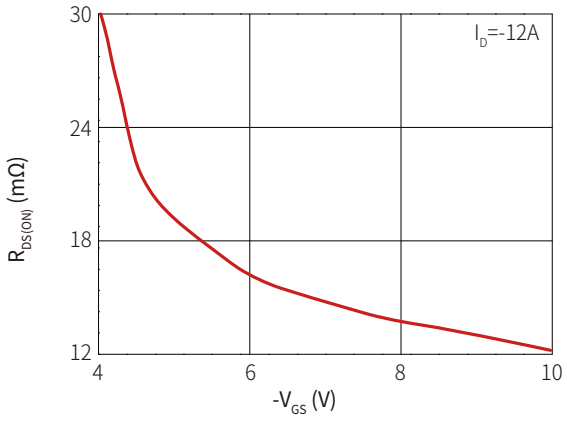


Figure 3: Forward Characteristics of Reverse

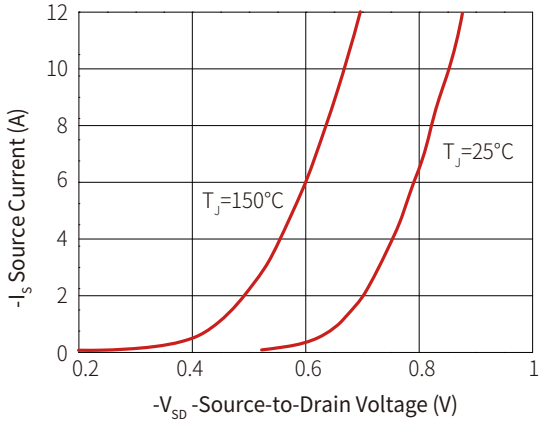


Figure 4:Gate-Charge Characteristics

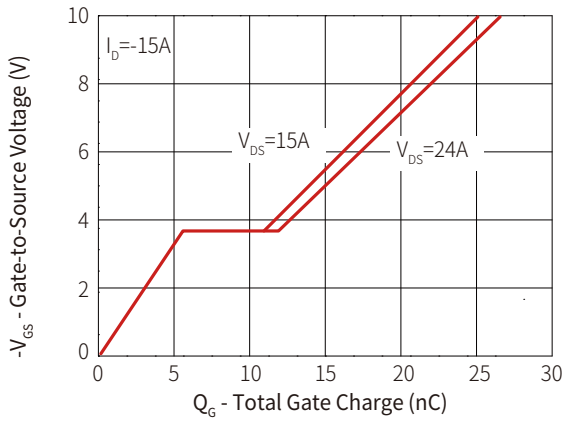


Figure 5: Normalized $V_{GS(th)}$ vs T_J

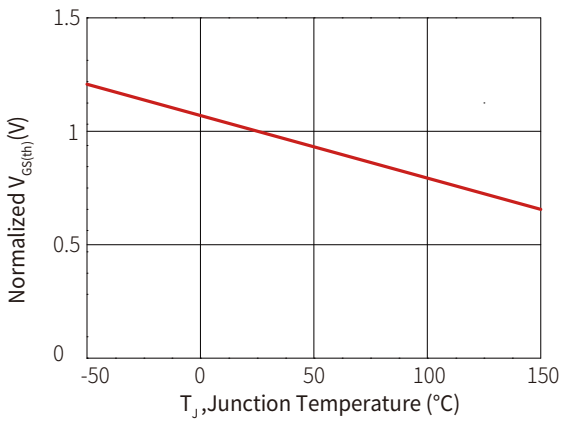


Figure 6: Normalized $R_{DS(ON)}$ vs T_J

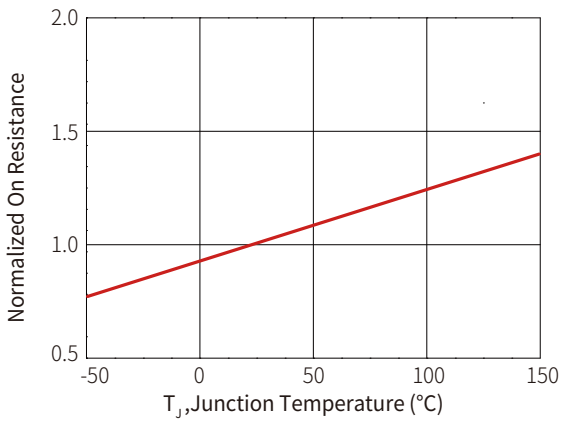


Figure 7：Capacitance

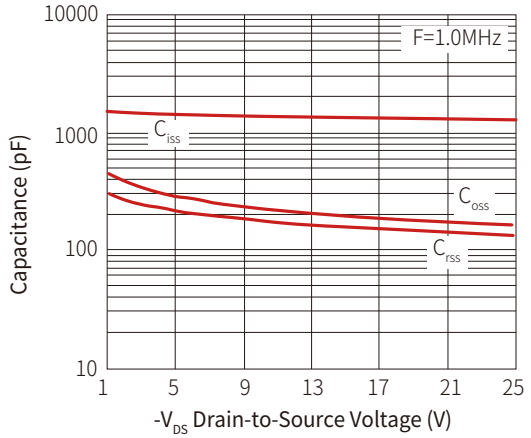


Figure 8：Safe Operating Area

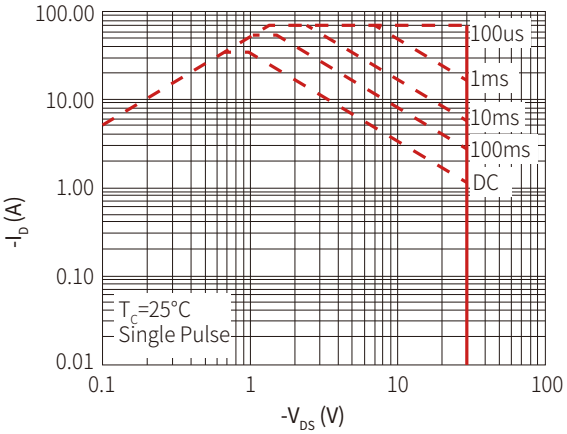


Figure 9：Normalized Maximum Transient Thermal Impedance

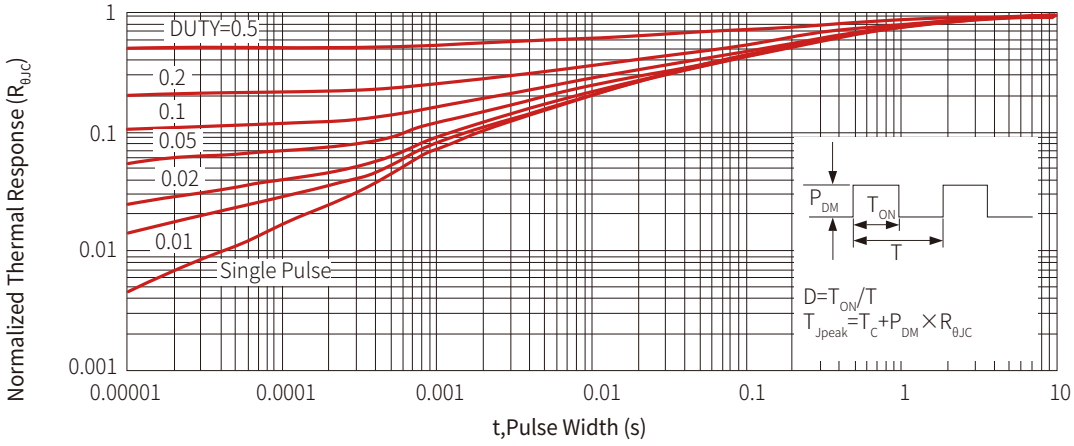


Figure 10：Switching Time Waveform

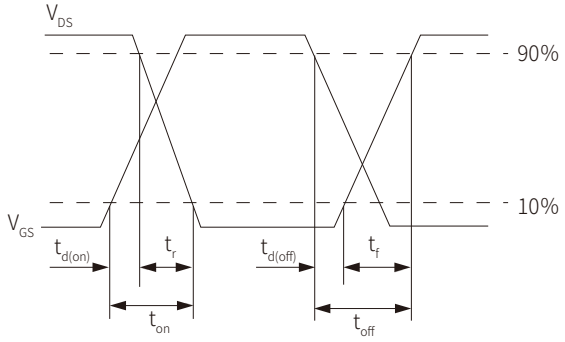
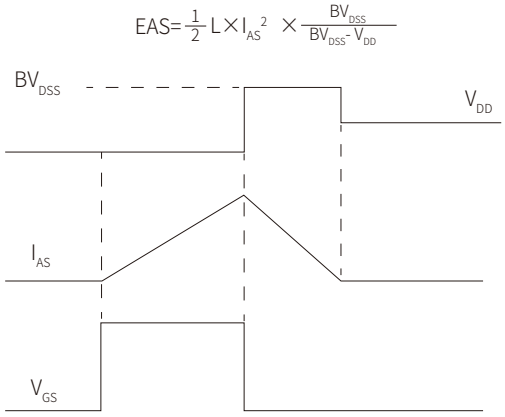
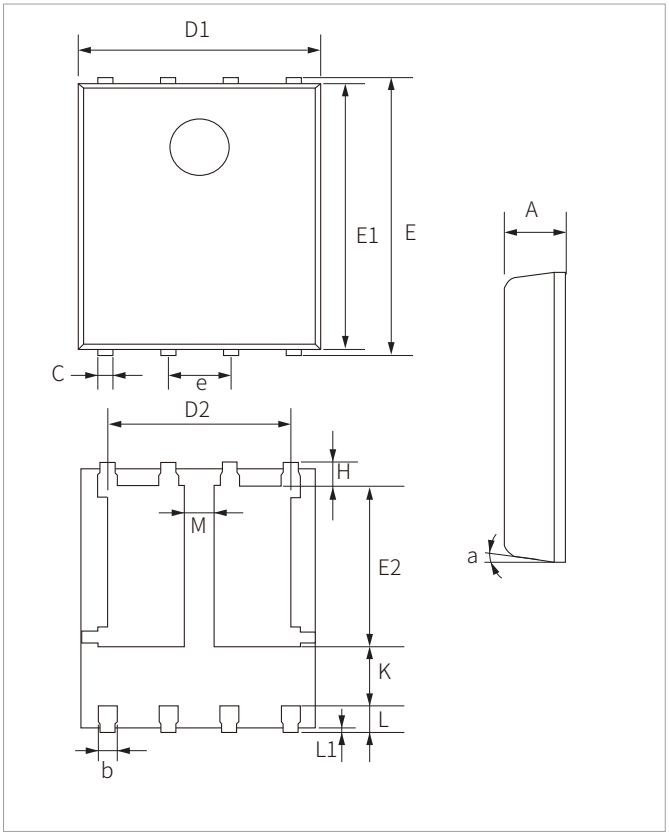


Figure 11：Unclamped Inductive Switching Waveform



PDFN5*6-8L PACKAGE INFORMATION



Ref.	Millimeters		
	Min.	Typ.	Max.
A	0.90	1.00	1.10
b	0.33	0.41	0.51
C	0.20	0.25	0.30
D1	4.80	4.90	5.00
D2	3.61	3.81	3.96
E	5.90	6.00	6.10
E1	5.70	5.75	5.80
E2	3.38	3.05	3.20
e	1.27BSC		
H	0.40	0.51	0.61
K	1.10	-	-
L	0.51	0.61	0.71
L1	0.06	0.13	0.20
M	0.50	-	-
a	0°	-	12°

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Part Number	Component Package	QTY/Reel	Reel Size
SNPM30G03	PDFN5×6-8L	5000PCS	13”

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