

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
100V	90mΩ@10V	10A
	100mΩ@4.5V	
-100V	-90mΩ@10V	-18A
	-100mΩ@4.5V	

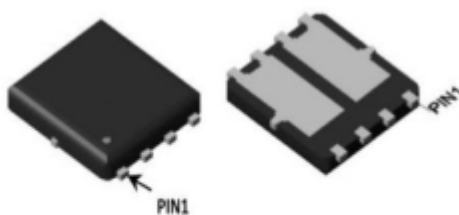
Feature

- TrenchFET Power MOSFET
- Excellent $R_{DS(on)}$ and Low Gate Charge
- Fast Switching Speed

Applications

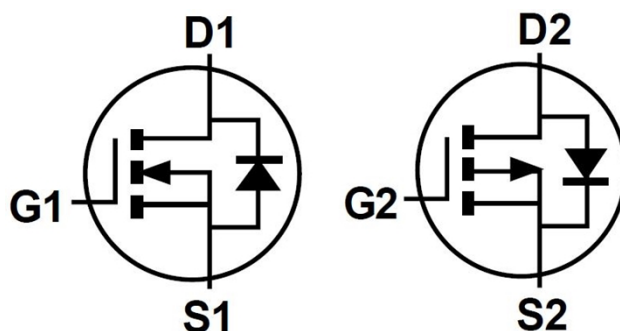
- Motor Control
- Inverters

Package

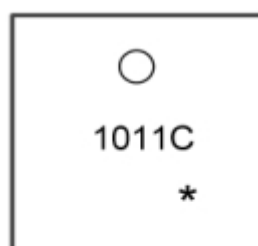


PDFN5×6-8L

Circuit diagram



Marking



1011C = Device code

*** = Month Code**

Absolute maximum ratings

($T_a=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Value		Unit
		N-Channel	P-Channel	
Drain-Source Voltage	V_{DS}	100	-100	V
Gate-Source Voltage	V_{GS}	± 20	± 20	V
Continuous Drain Current($t \leq 10\text{s}$)	I_D	10	-18	A
Single Pulse Avalanche Energy	E_{AS}	40	72	mJ
Power Dissipation($t \leq 10\text{s}$)	P_D	30	72	W
Thermal Resistance from Junction to Ambient($t \leq 10\text{s}$)	$R_{\theta JA}$	4.16	1.74	$^{\circ}\text{C/W}$
Junction Temperature	T_J	150		$^{\circ}\text{C}$
Storage Temperature	$T_{STG.}$	-55 to 150		$^{\circ}\text{C}$

N-Channel Electrical characteristics

($T_A=25^{\circ}\text{C}$, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV (BR)DSS	V _{GS} = 0V, I _D =250μA	100			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =80V, V _{GS} = 0V			1	uA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} = 0V			±100	uA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1	1.6	2.5	V
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} =10V, I _D =8A		90	115	mΩ
		V _{GS} =4.5V, I _D =6A		100	135	
Dynamic Characteristics						
Input capacitance	C _{iss}	V _{DS} =50V, V _{GS} =0V, f=1MHz		792		pF
Output capacitance	C _{Oss}			34.6		
Reverse transfer capacitance	C _{rss}			35.4		
Switching Characteristics						
Total Gate Charge	Q _g	V _{DS} =50V, V _{GS} =4.5V, I _D =8A		14		pF
Gate-Source Charge	Q _{gs}			2.5		
Gate-Drain Charge	Q _{gd}			2.62		
Turn-on Delay Time	T _{d(on)}	V _{DD} =50V, V _{GS} =10V, R _G =1.5Ω, I _D =8A		4.2		nS
Turn-on Rise Time	T _r			8.2		
Turn-Off Delay Time	T _{d(off)}			31		
Turn-Off Fall Time	t _f			4		
Source-Drain Diode Characteristics						
Body Diode Voltage	V _{SD}	I _S =1A, V _{GS} = 0V			1.2	V

Note:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. EAS data shows Max. rating . The test condition is $V_{DD}=50V, V_{GS}=10V, L=0.5mH$
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production

P-Channel Electrical characteristics

($T_A=25^{\circ}\text{C}$, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$BV_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-100			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -80V, V_{GS} = 0V$			1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	μA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1	-1.8	-2.5	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -8A$		90	115	m Ω
		$V_{GS} = -4.5V, I_D = -6A$		100	135	
Dynamic Characteristics						
Input capacitance	C_{iss}	$V_{DS} = -50V, V_{GS} = 0V,$ $f = 1MHz$		2029		pF
Output capacitance	C_{oss}			129		
Reverse transfer capacitance	C_{rss}			76		
Switching Characteristics						
Total Gate Charge	Q_g	$V_{DS} = -50V, V_{GS} = -4.5V,$ $I_D = -8A$		43		pF
Gate-Source Charge	Q_{gs}			9.5		
Gate-Drain Charge	Q_{gd}			5.8		
Turn-on Delay Time	$T_{d(on)}$	$V_{DD} = -50V, I_D = -1A,$ $V_{GS} = -10V, R_{GEN} = 6\Omega$		10		nS
Turn-on Rise Time	T_r			15		
Turn-Off Delay Time	$T_{d(off)}$			110		
Turn-Off Fall Time	t_f			70		
Source-Drain Diode Characteristics						
Body Diode Voltage	V_{SD}	$I_S = -1A, V_{GS} = 0V$			1.2	V

Note:

4. Repetitive Rating: Pulse width limited by maximum junction temperature.
6. EAS data shows Max. rating . The test condition is $V_{DD} = -15V, V_{GS} = -10V, L = 0.5mH$
7. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
8. Guaranteed by design, not subject to production

N-Channel Typical Characteristics

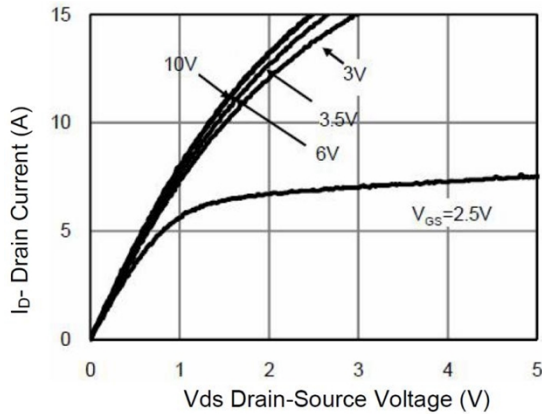


Figure 1 Output Characteristics

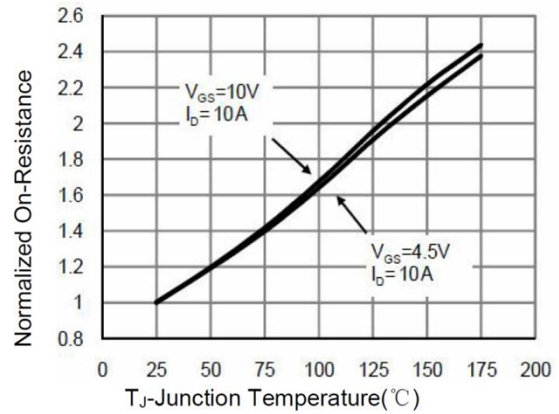


Figure 4 Rdson-Junction Temperature

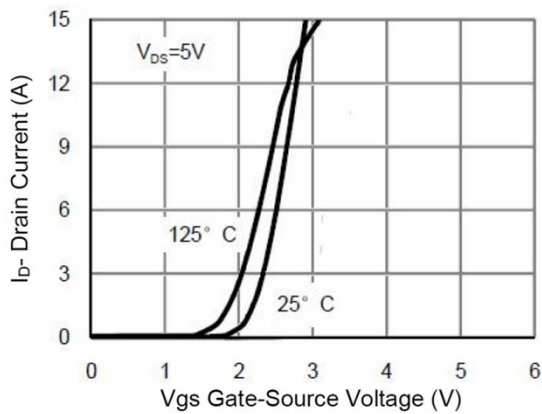


Figure 2 Transfer Characteristics

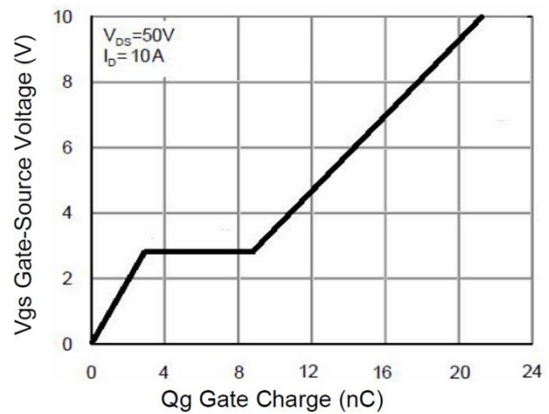


Figure 5 Gate Charge

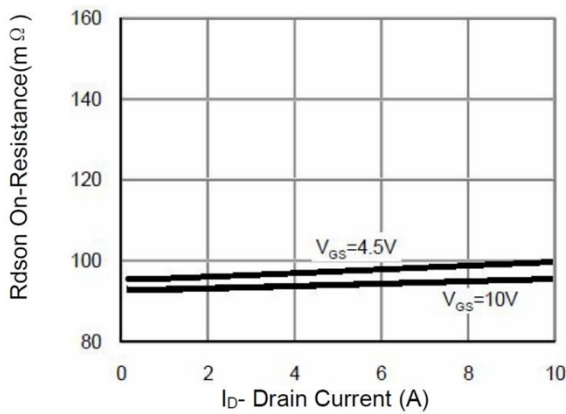


Figure 3 Rdson- Drain Current

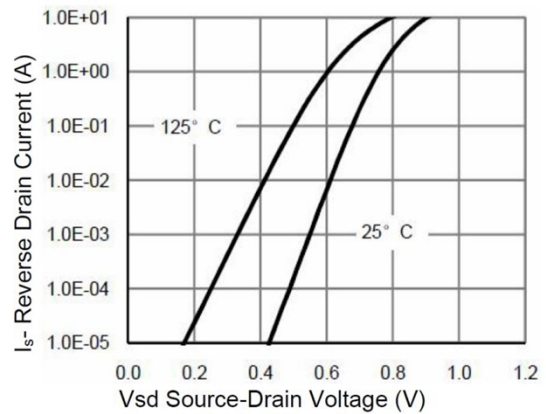


Figure 6 Source- Drain Diode Forward

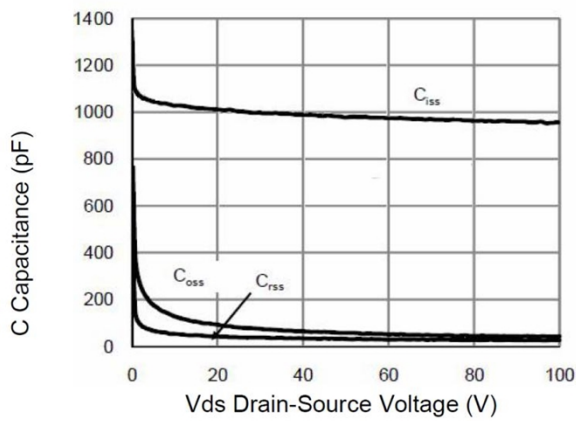


Figure 7 Capacitance vs Vds

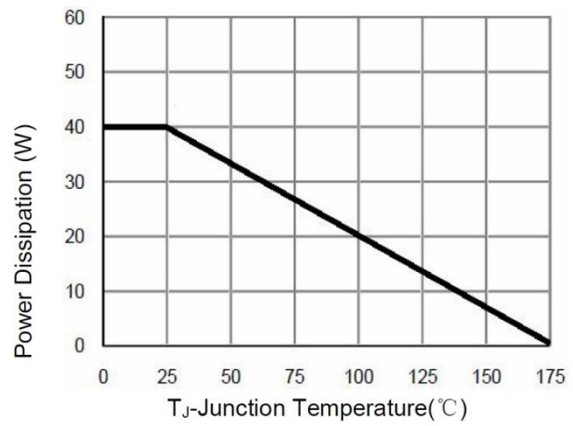


Figure 9 Power De-rating

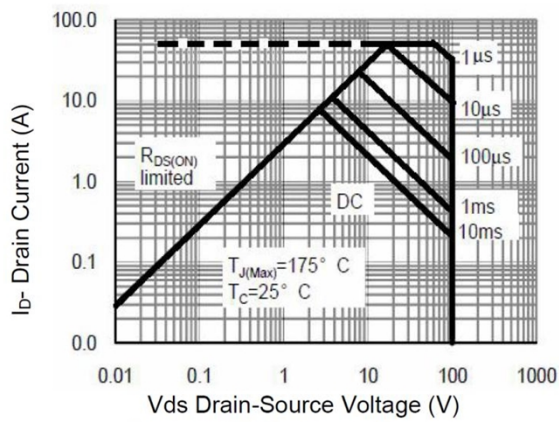


Figure 8 Safe Operation Area

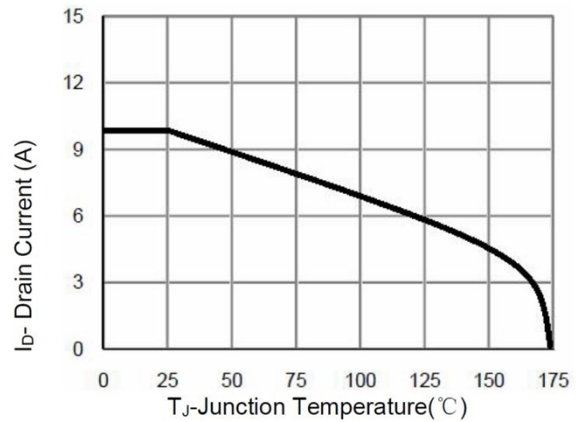


Figure 10 Current De-rating

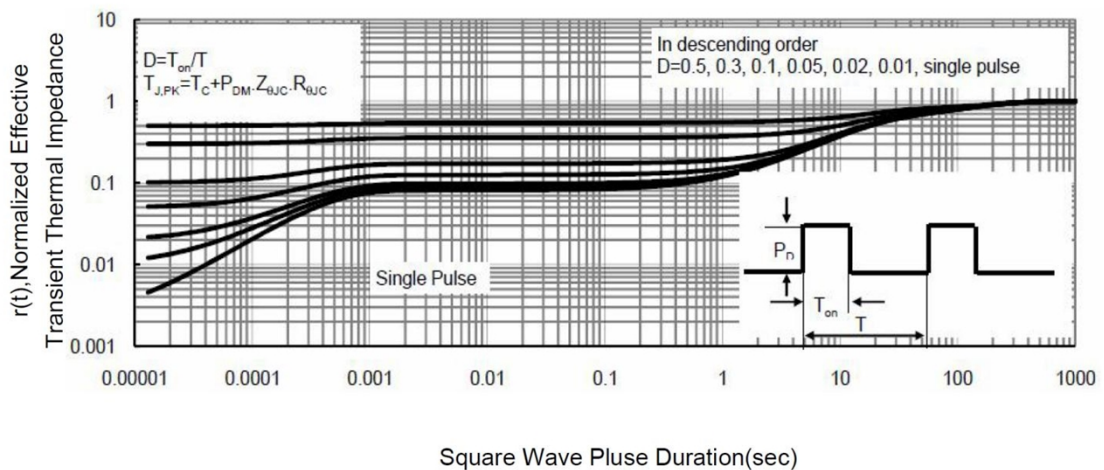
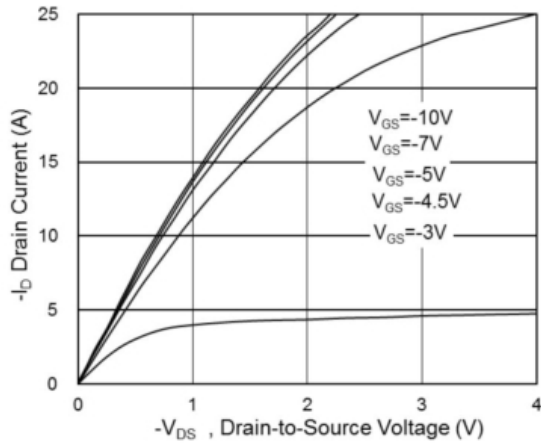
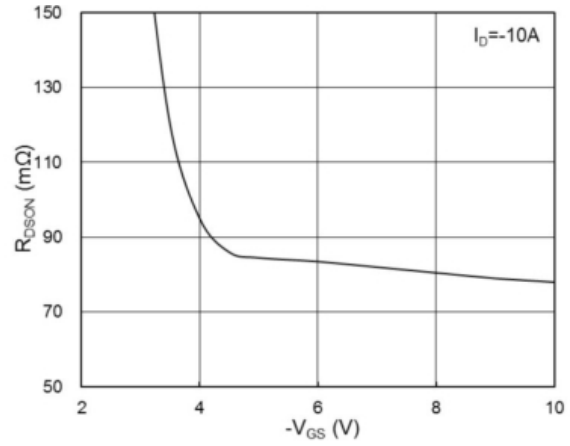


Figure 11 Normalized Maximum Transient Thermal Impedance

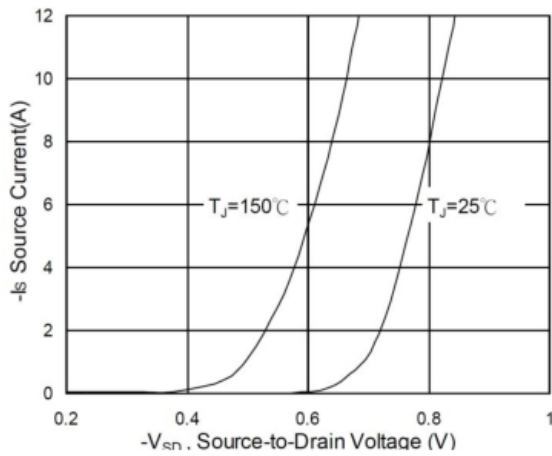
P-Channel Typical Characteristics



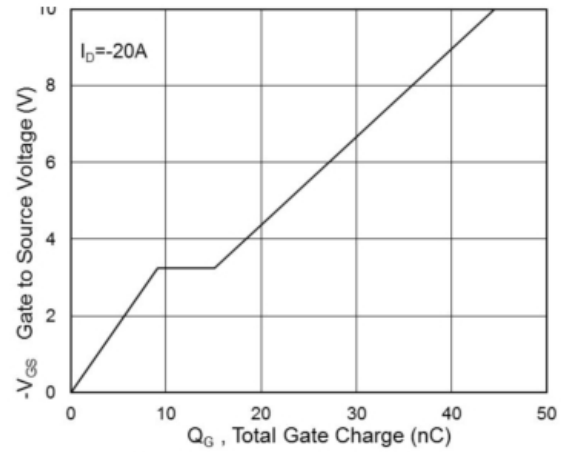
Output Characteristics



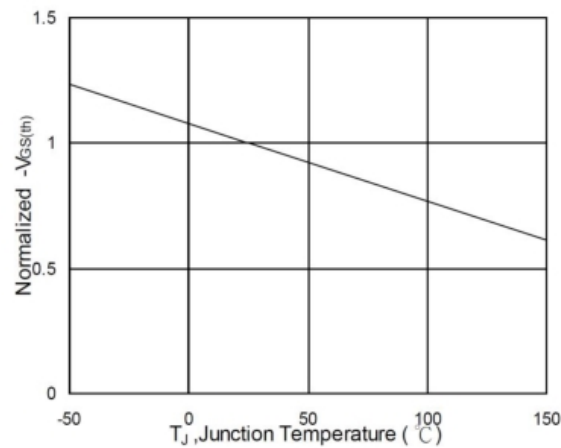
On-Resistance v.s Gate-Source



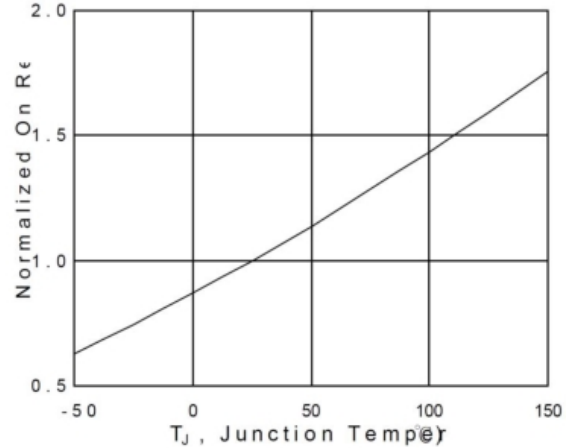
Forward Characteristics of Reverse

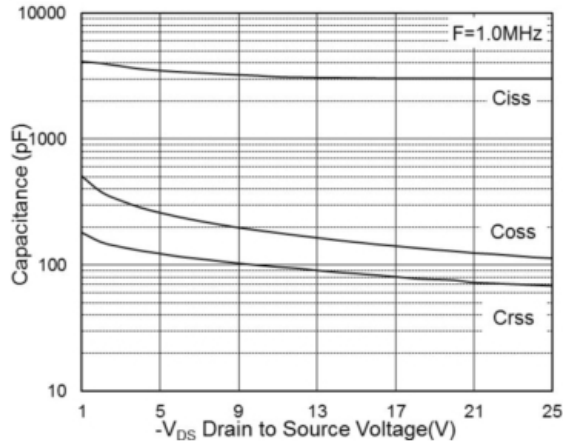


Gate-Charge Characteristics

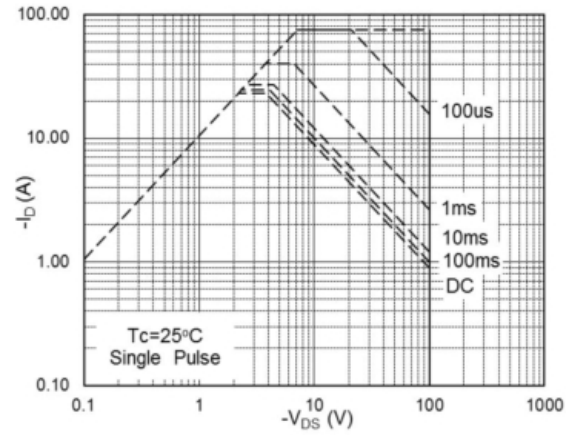


Normalized VGS(th) v.s TJ

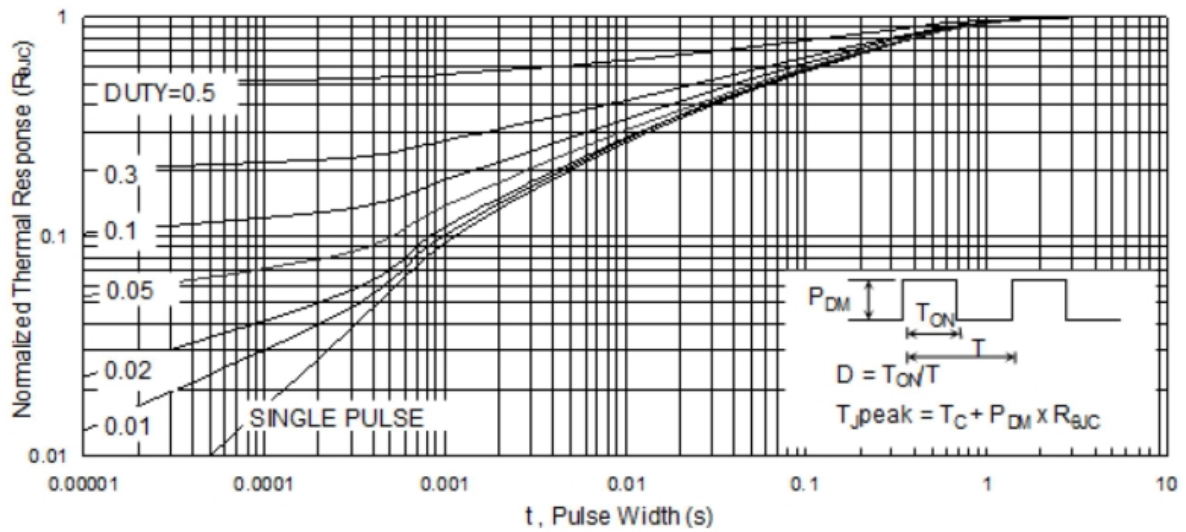

Normalized $R_{DS(on)}$ v.s TJ



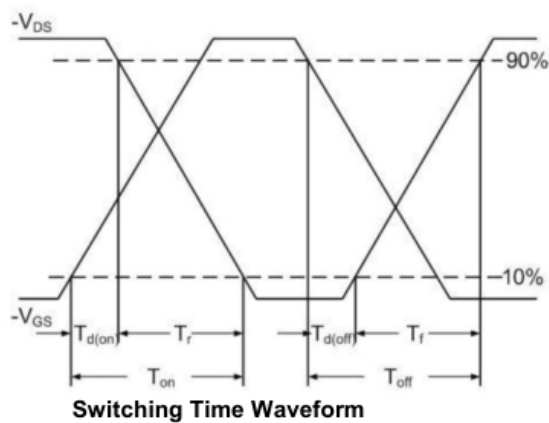
Capacitance vs Vds



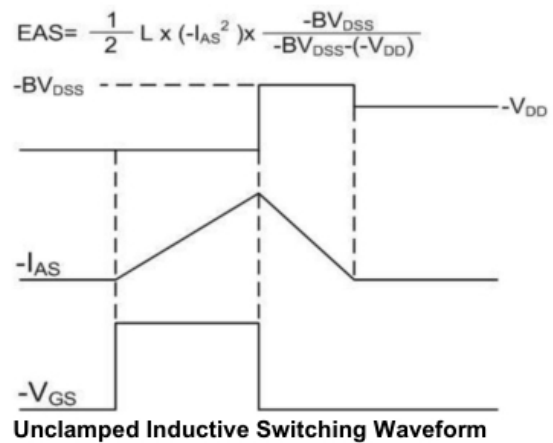
Safe Operating Area



Normalized Maximum Transient Thermal Impedance

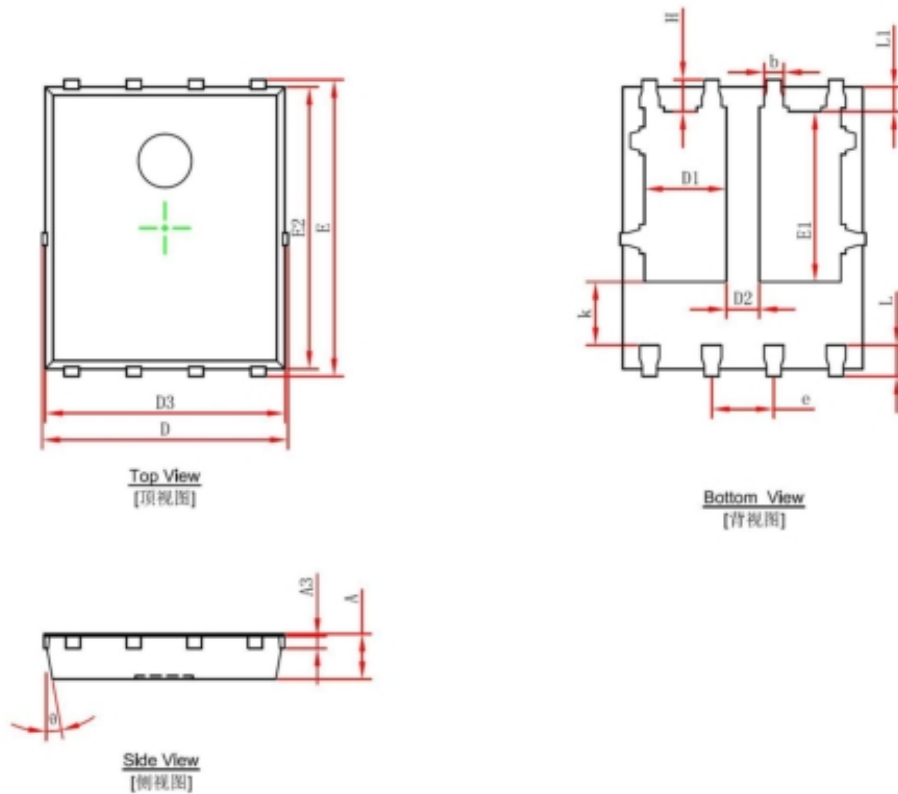


Switching Time Waveform



Unclamped Inductive Switching Waveform

PDFN5X6-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.000	0.035	0.039
A3	0.254 REF.		0.010 REF.	
D	4.944	5.096	0.195	0.201
E	5.974	6.126	0.235	0.241
D1	1.470	1.870	0.058	0.074
D2	0.470	0.870	0.019	0.034
E1	3.375	3.575	0.133	0.141
D3	4.824	4.976	0.190	0.196
E2	5.674	5.826	0.223	0.229
k	1.190	1.390	0.047	0.055
b	0.350	0.450	0.014	0.018
e	1.270 TYP.		0.050 TYP.	
L	0.559	0.711	0.022	0.028
L1	0.424	0.576	0.017	0.023
H	0.574	0.726	0.023	0.029
θ	10°	12°	10°	12°