

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
30V	11mΩ@10V	16A
	16mΩ@4.5V	
-30V	21mΩ@-10V	-12A
	30mΩ@-4.5V	

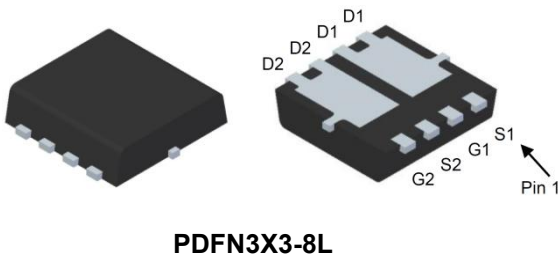
Feature

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

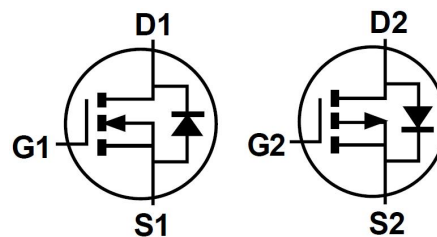
Application

- Bridge
- Inverters

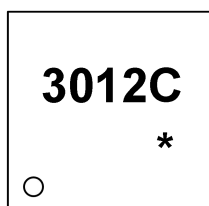
Package



Circuit diagram



Marking



3012C = Device code

* = Month Code

Absolute maximum ratings (Ta=25°C unless otherwise noted)

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($t \leq 10s$)	I_D	16	-12	A
Power Dissipation($t \leq 10s$)	P_D	1.8		W
Thermal Resistance from Junction to Ambient($t \leq 10s$)	$R_{\theta JA}$	70		$^{\circ}C/W$
Junction Temperature	T_J	150		$^{\circ}C$
Storage Temperature	T_{STG}	-55~ +150		$^{\circ}C$

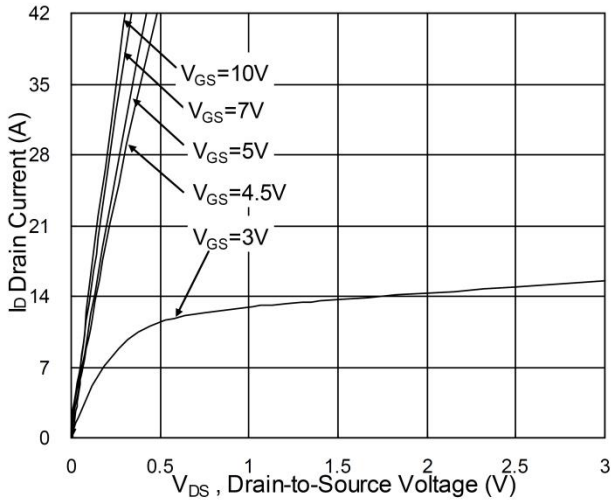
N-Channel Electrical characteristics (TA=25 °C, unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	30			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=30V, V_{GS}=0V$			1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1	1.5	2.5	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=8A$		11	15	m Ω
		$V_{GS}=4.5V, I_D=6A$		16	21	m Ω
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS}=15V, V_{GS}=0V, f=1.0MHz$		1317		pF
Output Capacitance	C_{oss}			163		pF
Reverse Transfer Capacitance	C_{rss}			131		pF
Switching Times						
Turn-on Delay Time	$t_{d(on)}$	$V_{GS}=10V, V_{DS}=15V, I_D=10A, R_{GEN}=3.3\Omega$		6.2		nS
Turn-on Rise Time	t_r			59		nS
Turn-Off Delay Time	$t_{d(off)}$			27.6		nS
Turn-Off Fall Time	t_f			8.4		nS
Total Gate Charge	Q_g	$V_{GS}=10V, V_{DS}=25V, I_D=12A$		12.6		nC
Gate-Source Charge	Q_{gs}			4.2		nC
Gate-Drain Charge	Q_{gd}			5.1		nC
Source-Drain Diode Characteristics						
Gate-Drain Charge	V_{SD}	$V_{GS}=0V, I_S=1A$			1.2	V

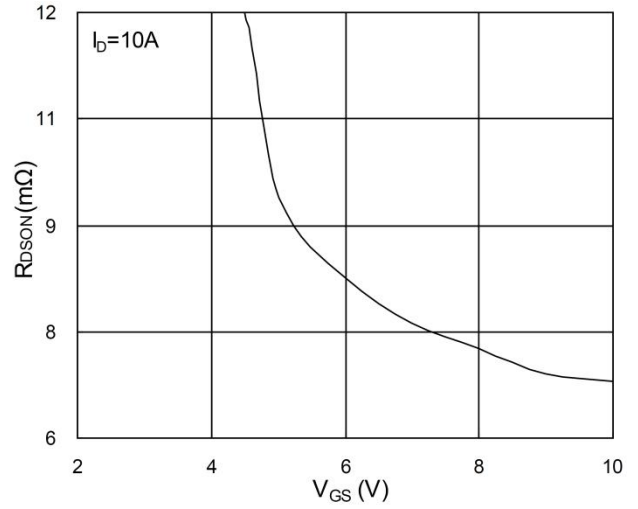
P-Channel Electrical characteristics (T_A=25 °C, unless otherwise noted)

Parameter	Symbo	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	VGS=0V , ID=-250uA	-30			V
Drain-Source Leakage Current	I _{DSS}	VDS=-24V , VGS=0V , T _J =25°C			1	uA
Gate-Source Leakage Current	I _{GSS}	VGS=±20V , VDS=0V			±100	nA
Gate Threshold Voltage	V _{GS(th)}	VGS=VDS , ID =-250uA	-1.0	-1.5	-2.5	V
Static Drain-Source On-Resistance	R _{DS(on)}	VGS=-10V , ID=-6A		21	27	mΩ
		VGS=-4.5V , ID=-4A		30	40	
Dynamic characteristics						
Total Gate Charge (-4.5V)	Q _g	VDS=-20V , VGS=-4.5V , ID=-12A		9.8		nC
Gate-Source Charge	Q _{gs}			2.2		
Gate-Drain Charge	Q _{gd}			3.4		
Turn-On Delay Time	T _{d(on)}	VDD=-24V , VGS=-10V , RG=3.3Ω , ID=-1A		16.4		ns
Rise Time	T _r			20.2		
Turn-Off Delay Time	T _{d(off)}			55		
Fall Time	T _f			10		
Input Capacitance	C _{iss}	VDS=-15V , VGS=0V , f=1MHz		930		pF
Output Capacitance	C _{oss}			148		
Reverse Transfer Capacitance	C _{rss}			115		
Source-Drain Diode characteristics						
Diode Forward Voltage	V _{SD}	VGS=0V , IS=-1A , T _J =25°C			-1.2	V

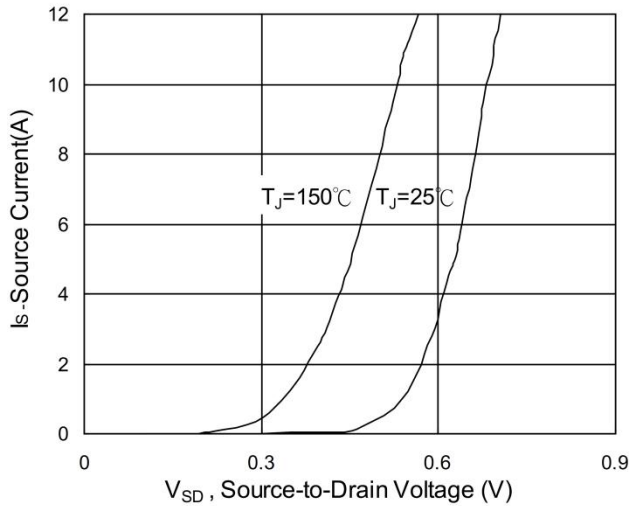
N-Channel Typical Characteristics



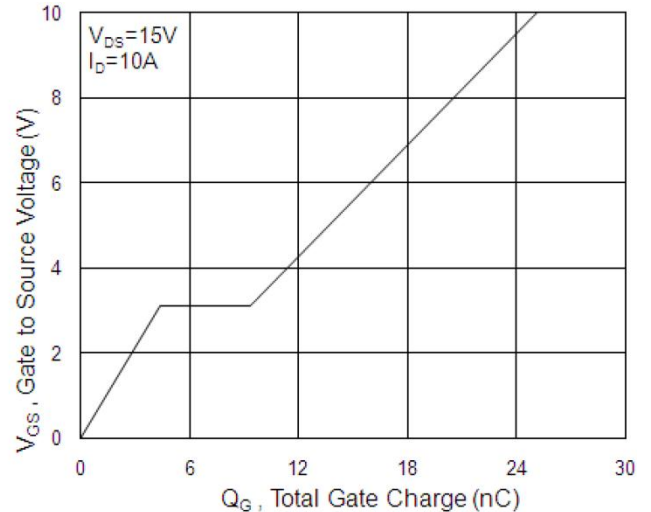
Typical Output Characteristics



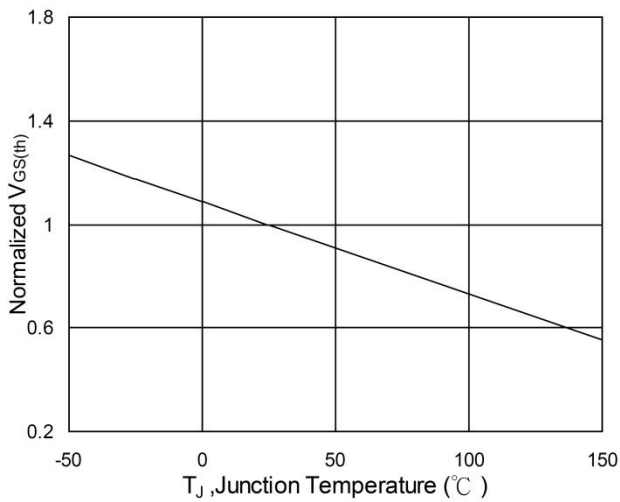
On-Resistance vs. Gate-Source



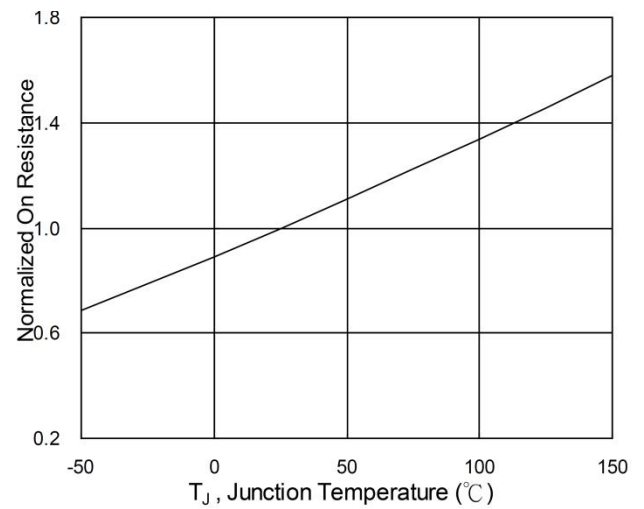
Forward Characteristics of reverse



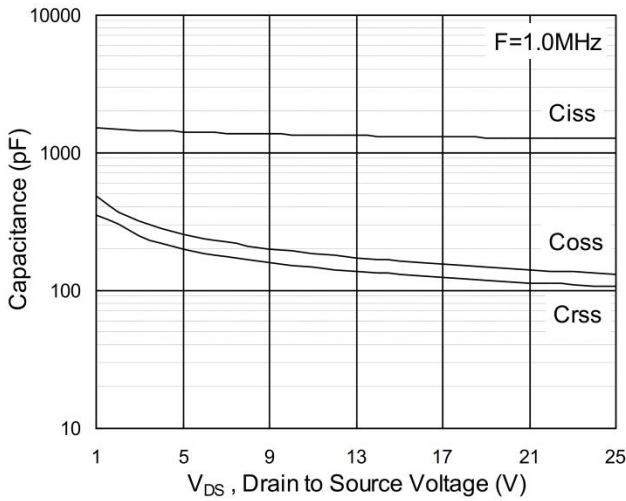
Gate-Charge Characteristics



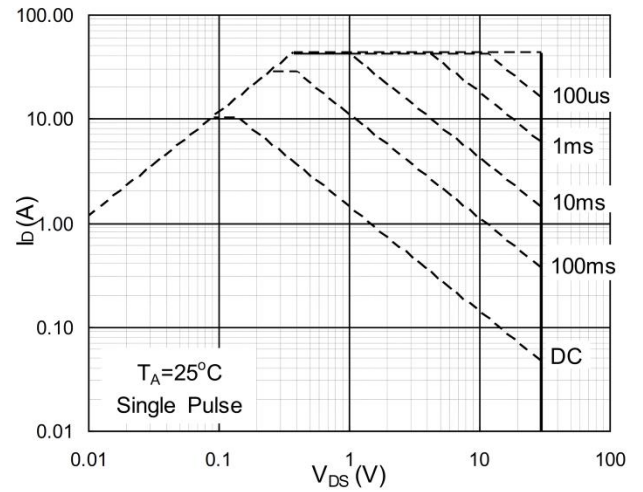
Normalized $V_{GS(th)}$ vs. T_J



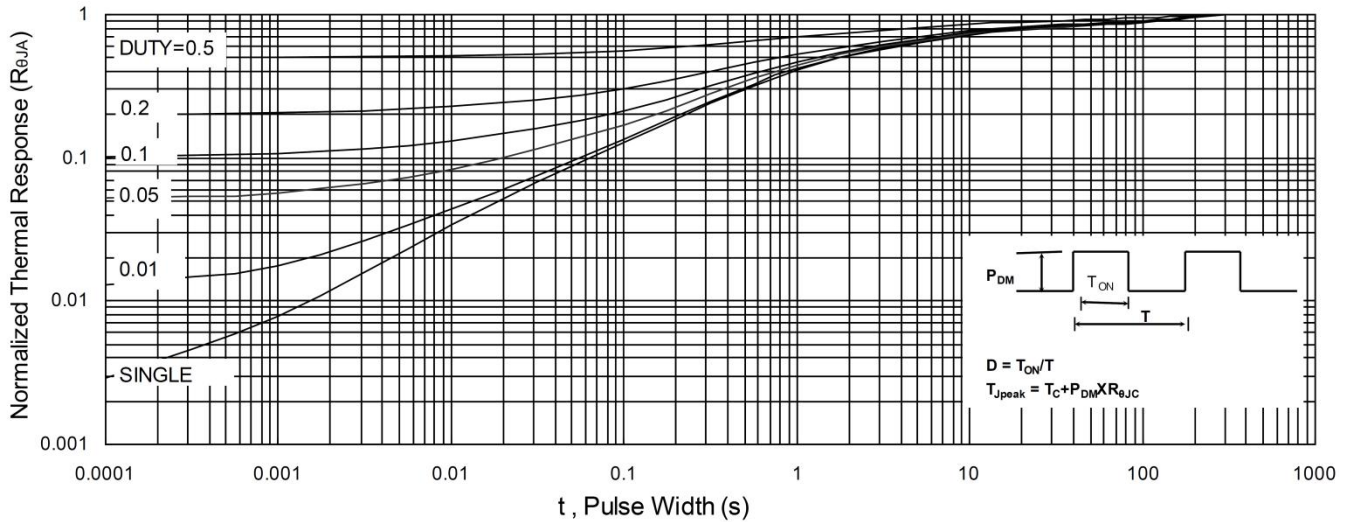
Normalized $R_{DS(on)}$ vs. T_J



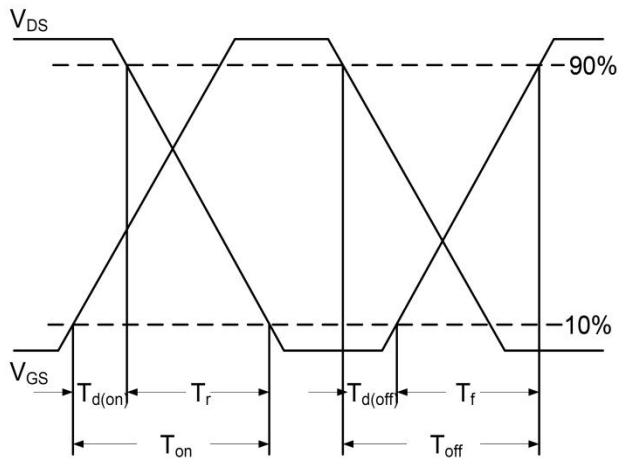
Capacitance



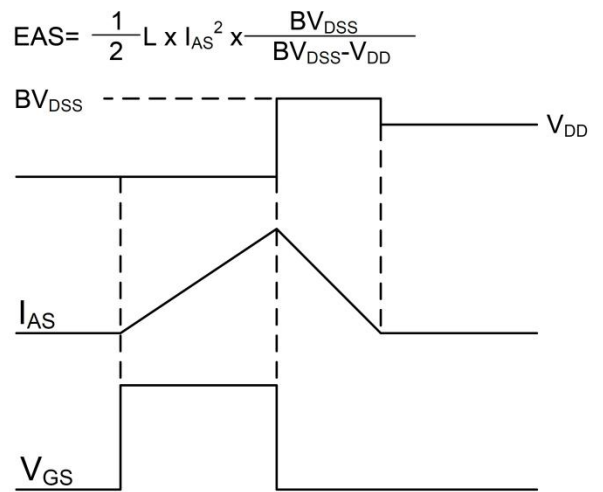
Safe Operating Area



Normalized Maximum Transient Thermal Impedance

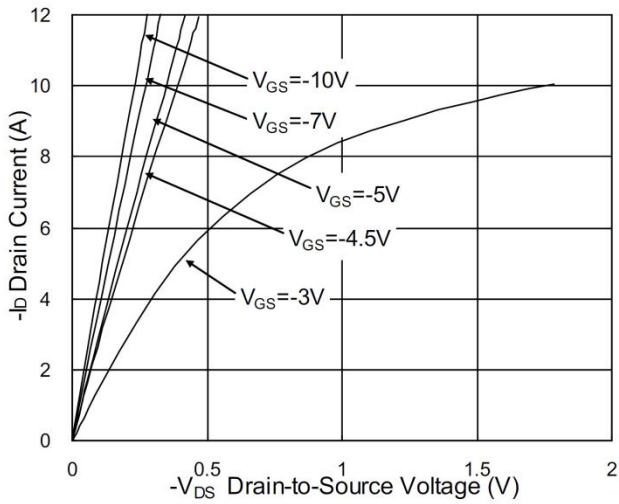


Switching Time Waveform

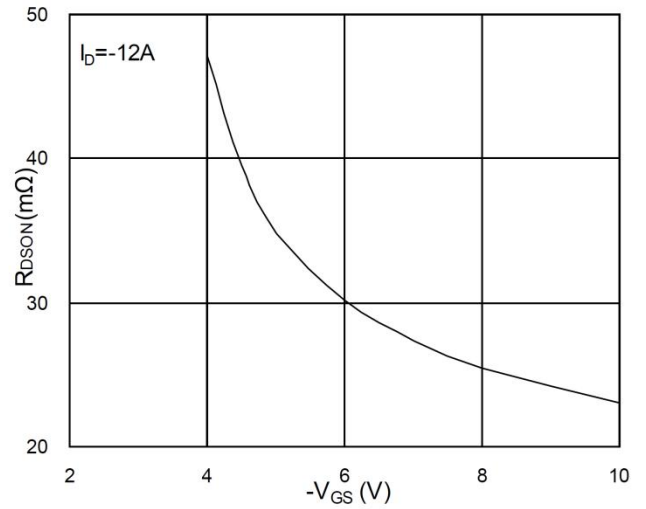


Unclamped Inductive Switching Waveform

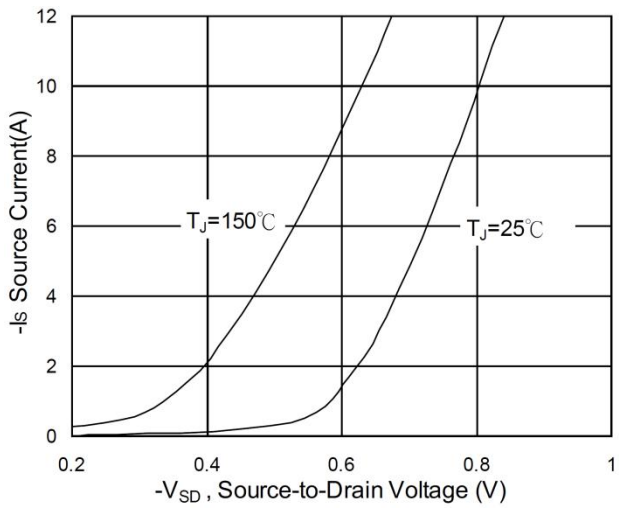
P-Channel Typical Characteristics



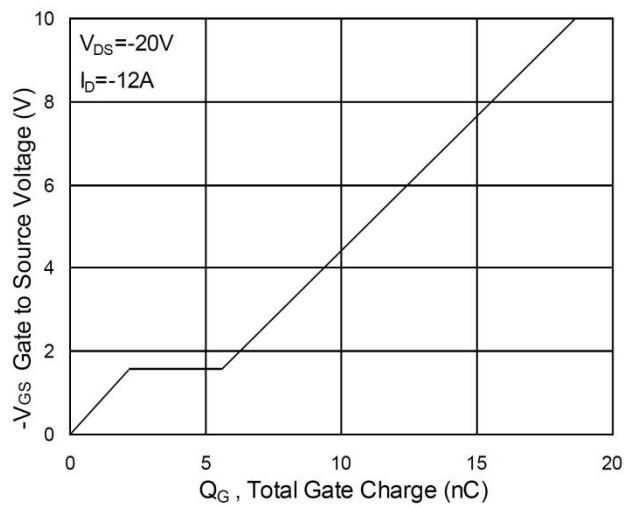
Output Characteristics



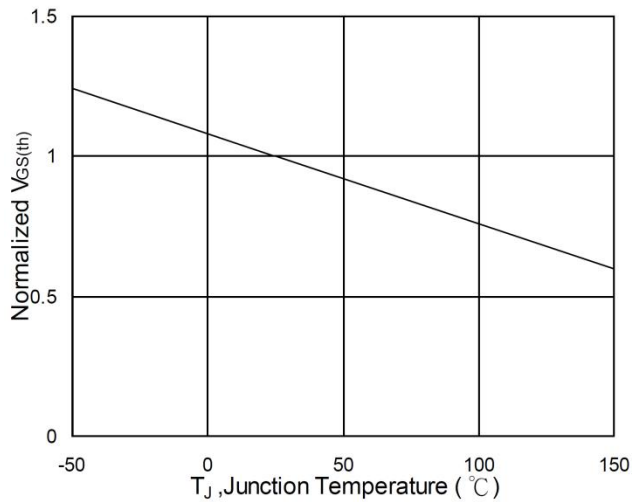
On-Resistance v.s Gate-Source



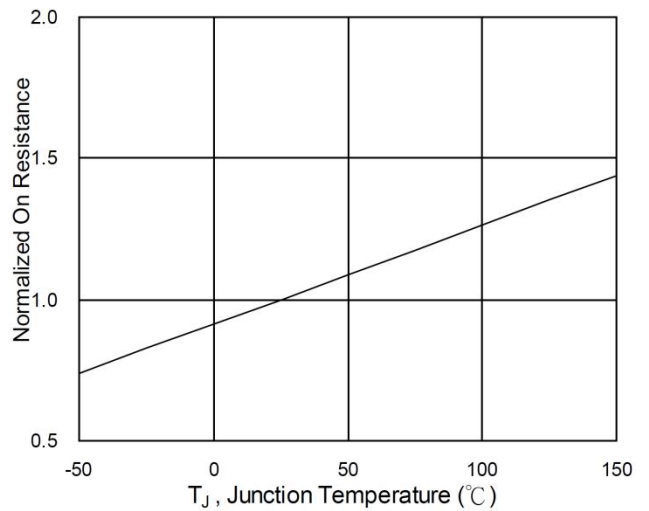
Forward Characteristics of Reverse



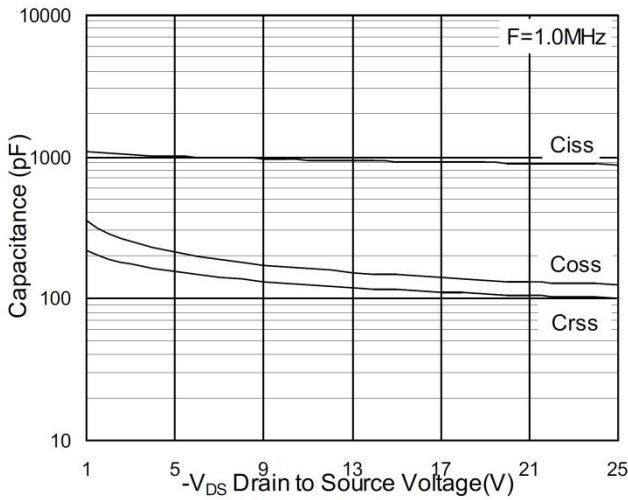
Gate-Charge Characteristics



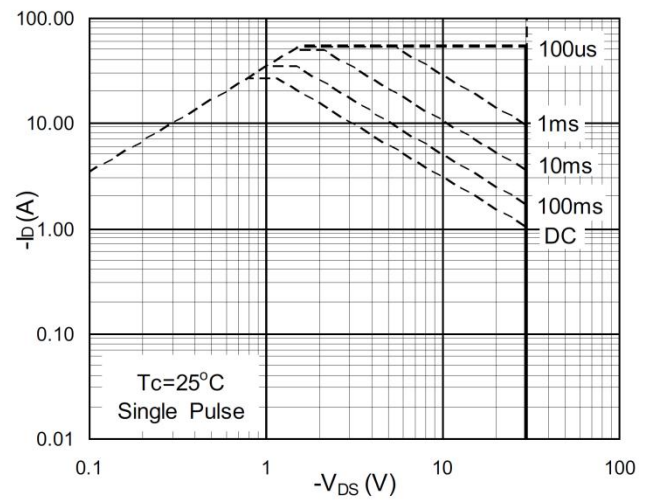
Normalized VGS(th) v.s TJ



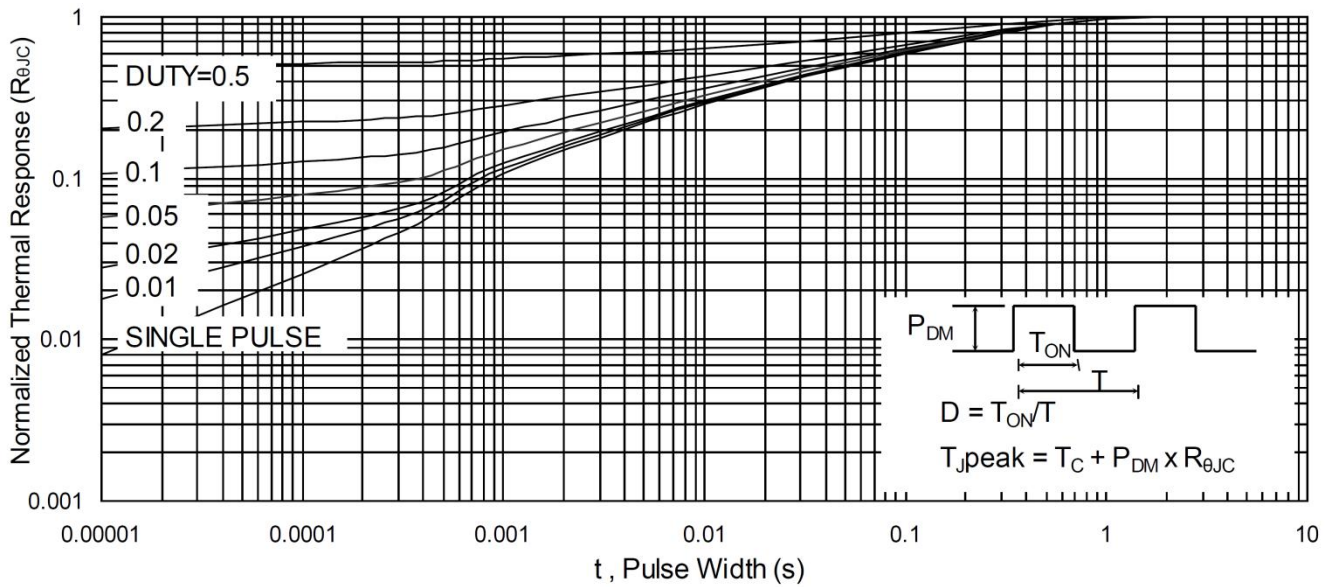
Normalized RDS(on) v.s TJ



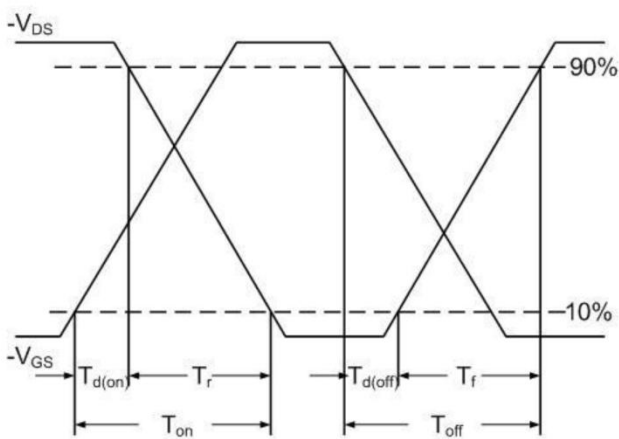
Capacitance vs Vds



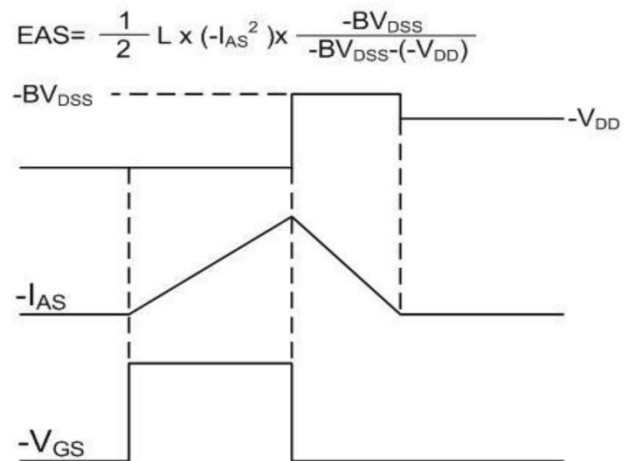
Safe Operating Area



Normalized Maximum Transient Thermal Impedance



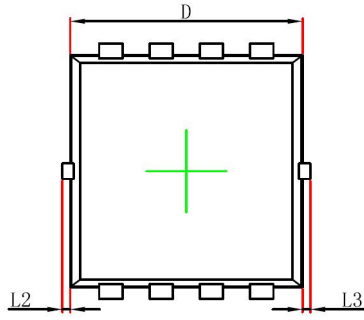
Switching Time Waveform



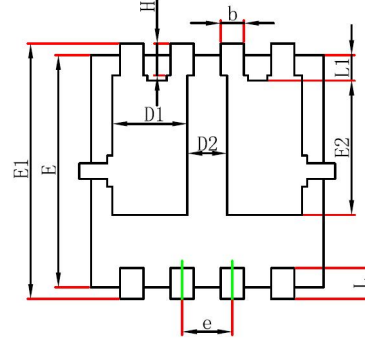
Unclamped Inductive Switching Waveform



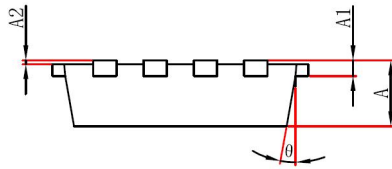
PDFN3X3-8L Package Information



Top View
[顶视图]



Bottom View
[背视图]



Side View
[侧视图]

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.650	0.850	0.026	0.033
A1	0.152 REF.		0.006 REF.	
A2	0~0.05		0~0.002	
D	2.900	3.100	0.114	0.122
D1	0.935	1.135	0.037	0.045
D2	0.280	0.480	0.011	0.019
E	2.900	3.100	0.114	0.122
E1	3.150	3.450	0.124	0.136
E2	1.535	1.935	0.060	0.076
b	0.200	0.400	0.008	0.016
e	0.550	0.750	0.022	0.030
L	0.300	0.500	0.012	0.020
L1	0.180	0.480	0.007	0.019
L2	0~0.100		0~0.004	
L3	0~0.100		0~0.004	
H	0.315	0.515	0.012	0.020
θ	9°	13°	9°	13°

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