

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
30V	8mΩ@10V	21A
	12mΩ@4.5V	
-30V	22mΩ@-10V	-15A
	27mΩ@-4.5V	

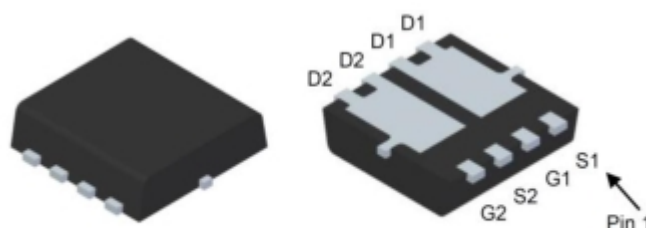
Feature

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

Applications

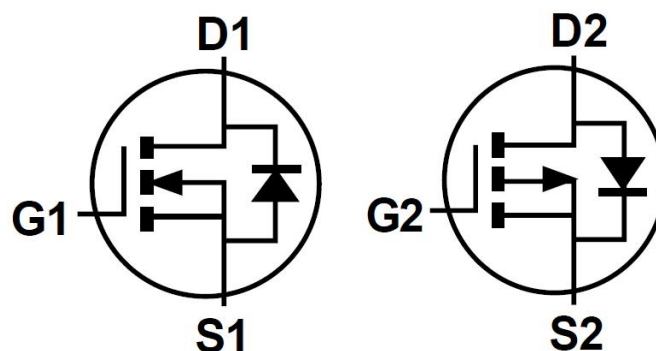
- Bridge
- Inverters

Package

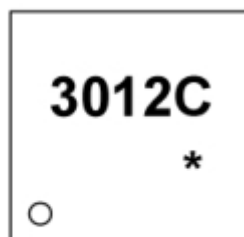


PDFNWB3.3×3.3-8L-B

Circuit diagram



Marking



3012C = 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}	30	-30	V
Gate-Source Voltage	V_{GS}	± 20	± 20	V
Continuous Drain Current($t \leq 10\text{s}$)	I_D	21	-15	A
Power Dissipation($t \leq 10\text{s}$)	P_D	1.8		W
Thermal Resistance from Junction to Ambient($t \leq 10\text{s}$)	$R_{\theta JA}$	70		$^{\circ}\text{C}/\text{W}$
Junction Temperature	T_J	150		$^{\circ}\text{C}$
Storage Temperature	T_{STG}	-55~ +150		$^{\circ}\text{C}$

N-Channel Electrical characteristics

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

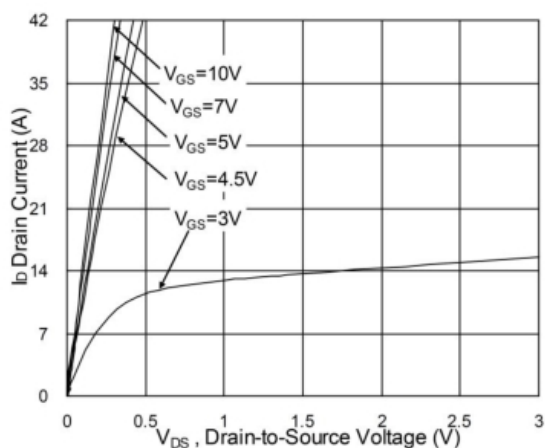
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	BV (BR)DSS	V _{GS} = 0V, I _D =250μA	30			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =30V, V _{GS} = 0V			1	μA
Gate-body leakage current	I _{GSS}	V _{GS} =±20V, V _{DS} = 0V			±100	μA
Gate threshold voltage ⁽¹⁾	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1	1.5	2.2	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =8A		8	13	mΩ
		V _{GS} =4.5V, I _D =6A		12	17	
Dynamic Characteristics						
Input capacitance	C _{iSS}	V _{DS} =15V, V _{GS} =0V, f=1MHz		1317		pF
Output capacitance	C _{oss}			163		
Reverse transfer capacitance	C _{rSS}			131		
Switching Characteristics						
Turn-on Delay Time	T _{d(on)}	V _{DS} =10V, V _{GS} =15V, I _D =10A , R _G =3.3Ω		6.2		nS
Turn-on Rise Time	T _r			59		
Turn-Off Delay Time	T _{d(off)}			27.6		
Turn-Off Fall Time	t _f			8.4		
Total gate charge	Q _g	V _{GS} =10V, V _{DS} =25V, I _D =12A		12.6		nC
Gate-source charge	Q _{gs}			4.2		
Gate-drain charge	Q _{gd}			5.1		
Source-Drain Diode Characteristics						
Gate-Drain Charge	V _{SD}	I _S =1A, V _{GS} = 0V			1.2	V

P-Channel Electrical characteristics

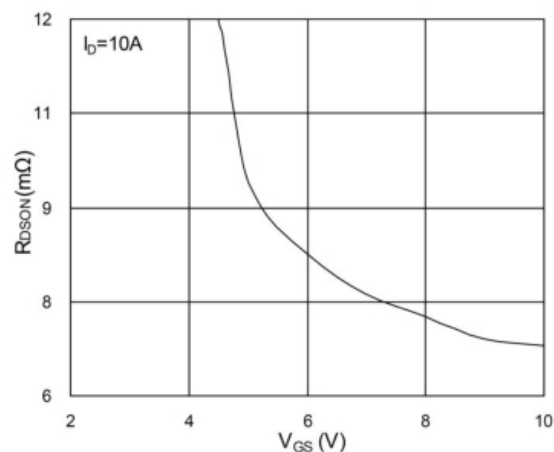
(T_A=25°C, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	$BV_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-30			V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = -24V, V_{GS} = 0V$			1	μA
Gate-body leakage current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	μA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1.0		-2.5	V
Drain-source on-resistance	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -8A$		22	30	m Ω
		$V_{GS} = -4.5V, I_D = -6A$		27	45	
Dynamic Characteristics						
Total gate charge	Q_g	$V_{DS} = -20V, V_{GS} = -4.5V, I_D = -12A$		9.8		nC
Gate-source charge	Q_{gs}			2.2		
Gate-drain charge	Q_{gd}			3.4		
Turn-on Delay Time	$T_{d(on)}$	$V_{DD} = -24V, V_{GS} = -10V, R_G = 3.3\Omega, I_D = -1A$		16.4		nS
Turn-on Rise Time	T_r			20.2		
Turn-Off Delay Time	$T_{d(off)}$			55		
Turn-Off Fall Time	t_f			10		
Input capacitance	C_{iss}	$V_{DS} = -15V, V_{GS} = -4.5V, f = 1MHz$		930		pF
Output capacitance	C_{oss}			148		
Reverse transfer capacitance	C_{rss}			115		
Source-Drain Diode Characteristics						
Body Diode Voltage	V_{SD}	$I_S = -1A, V_{GS} = 0V, T_J = 25^\circ C$			-1.2	V

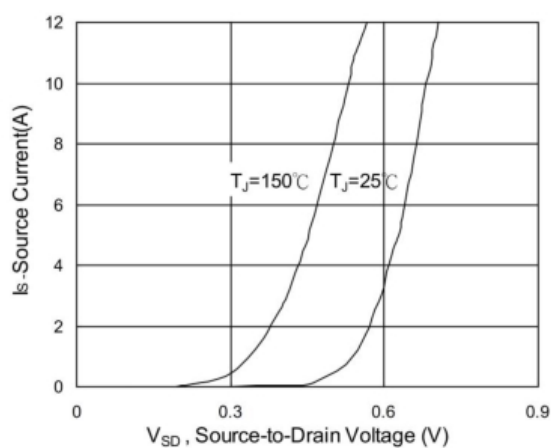
N-Channel Typical Characteristics



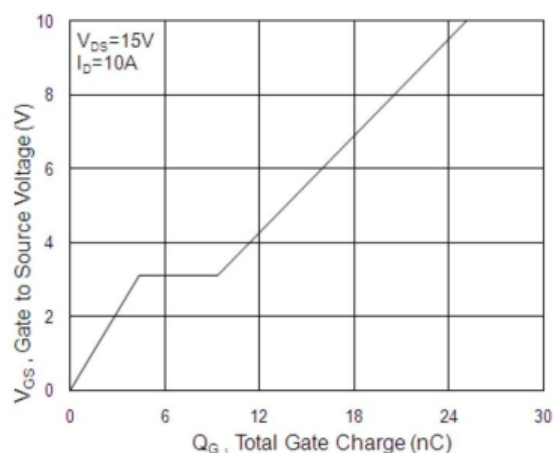
Typical Output Characteristics



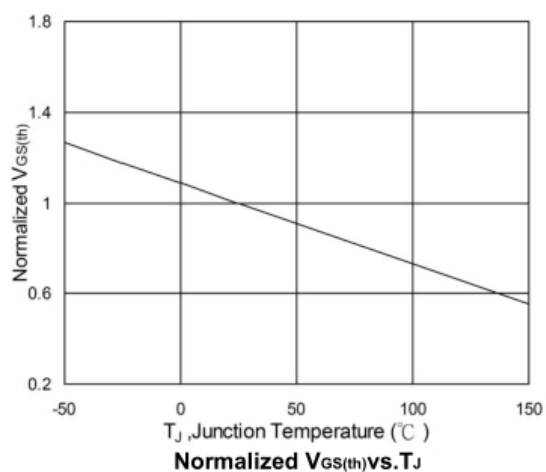
On-Resistance vs. Gate-Source



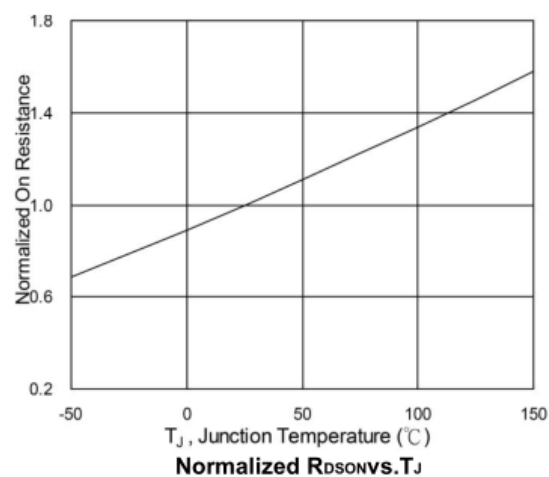
Forward Characteristics of reverse



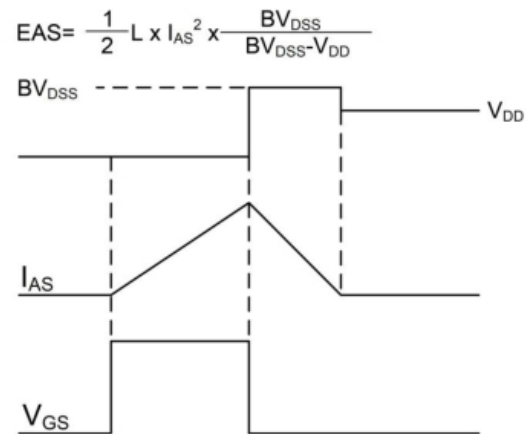
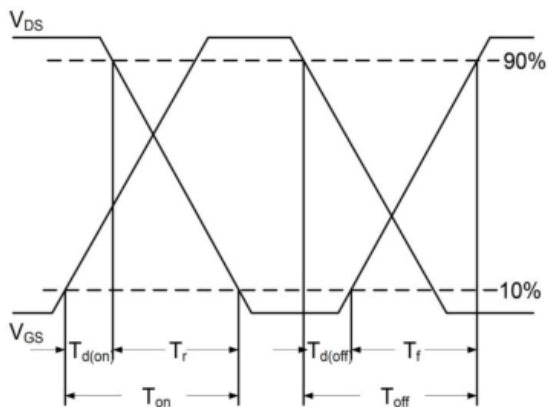
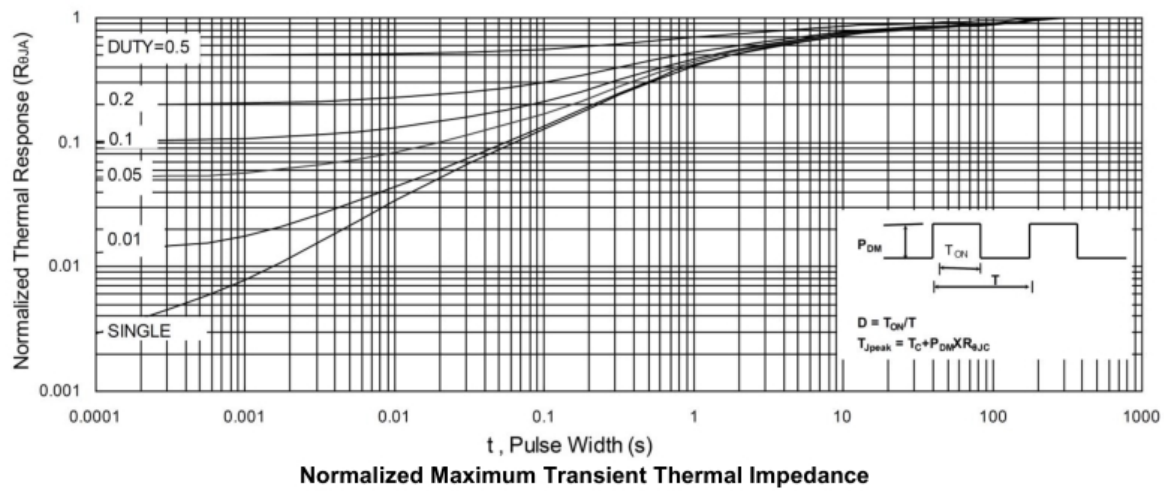
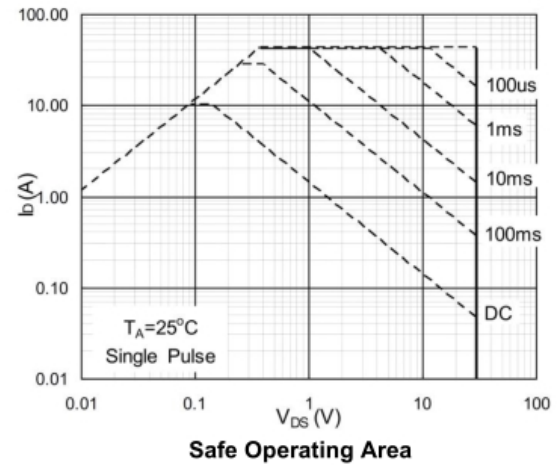
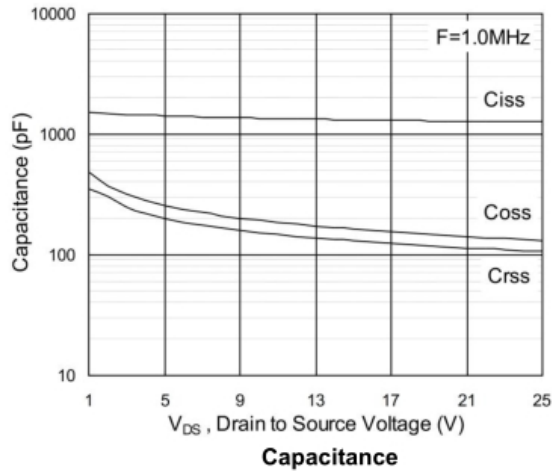
Gate-Charge Characteristics



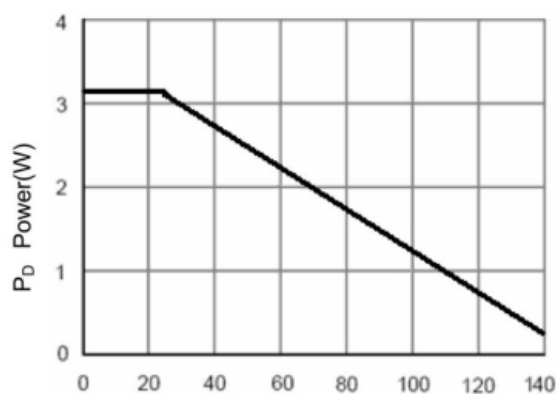
Normalized $V_{GS(th)}$ vs. T_J



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

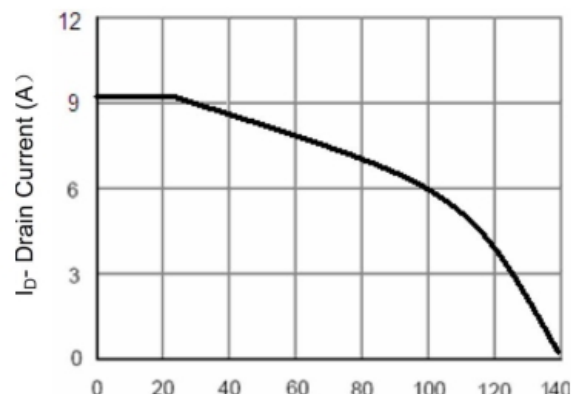


P-Channel Typical Characteristics



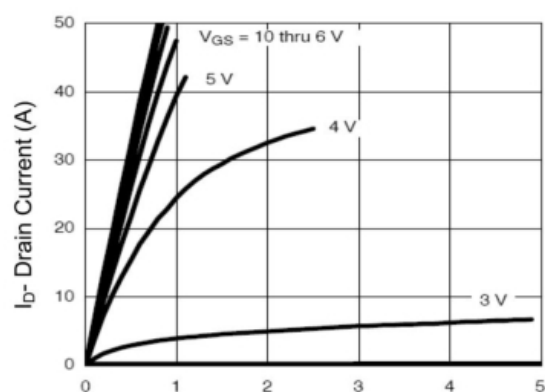
T_J -Junction Temperature(°C)

Power Dissipation



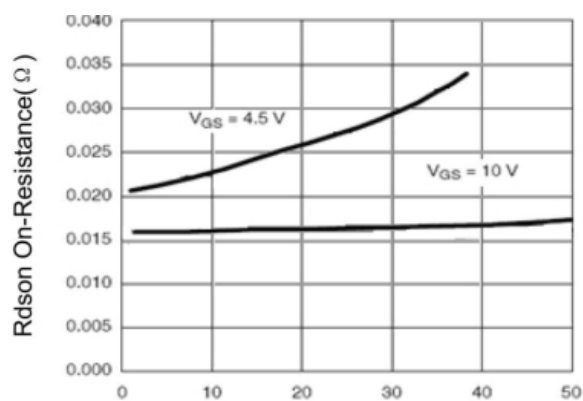
T_J -Junction Temperature(°C)

Drain Current



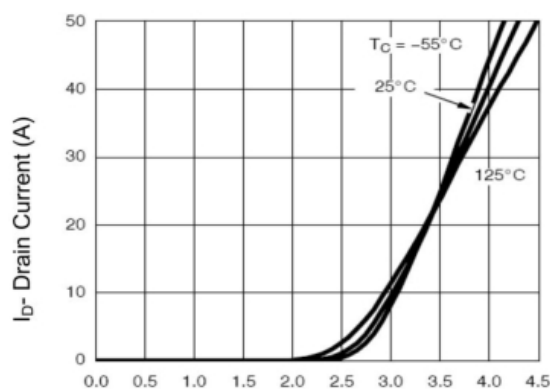
V_{DS} Drain-Source Voltage (V)

Output Characteristics



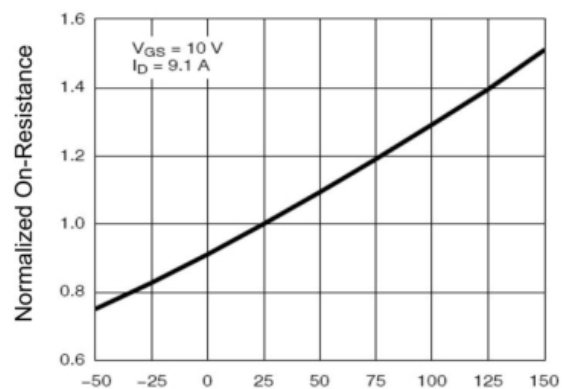
I_D - Drain Current (A)

Drain-Source On-Resistance



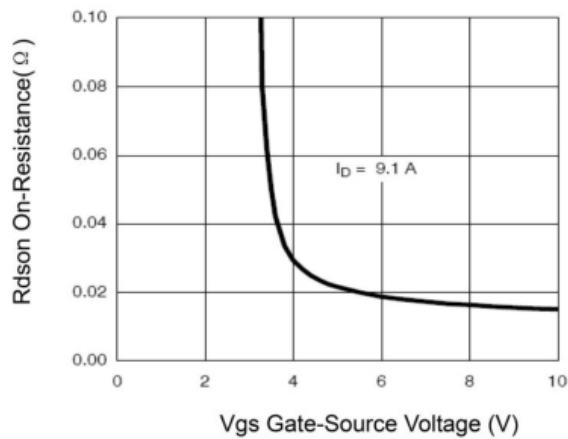
V_{GS} Gate-Source Voltage (V)

Transfer Characteristics

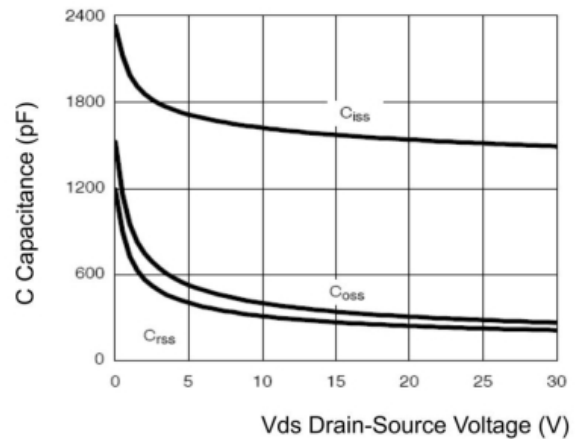


T_J -Junction Temperature(°C)

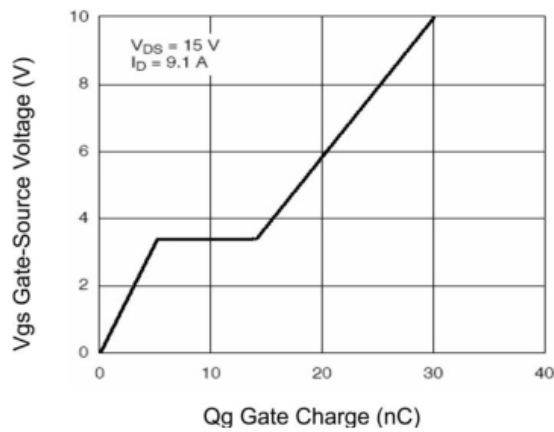
Drain-Source On-Resistance



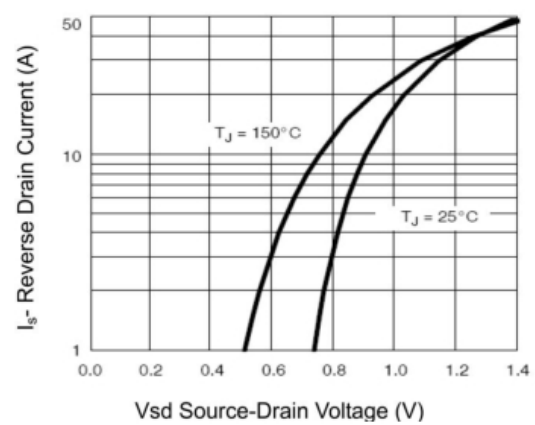
Rdson vs Vgs



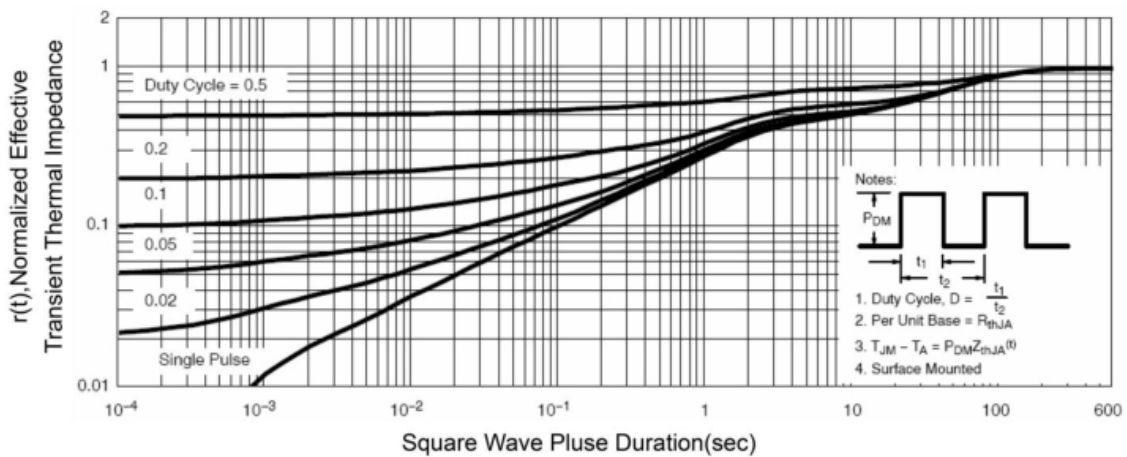
Capacitance vs Vds



Gate Charge

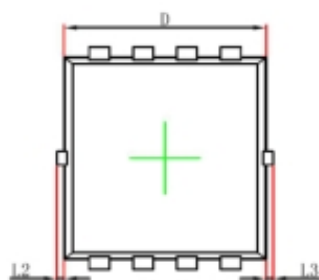


Source- Drain Diode Forward

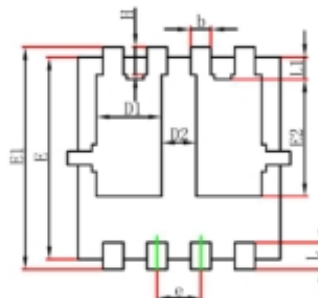


Normalized Maximum Transient Thermal Impedance

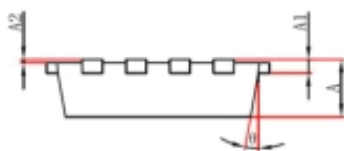
PDFNWB3.3×3.3-8L-B Package Information



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°