

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	$I_D$
30V	15mΩ@10V	8A
	21mΩ@4.5V	
-30V	18mΩ@-10V	-7A
	25mΩ@-4.5V	

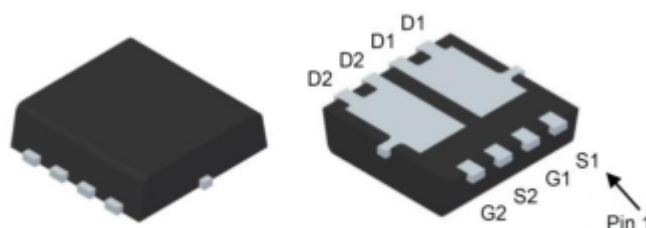
## Feature

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

## Application

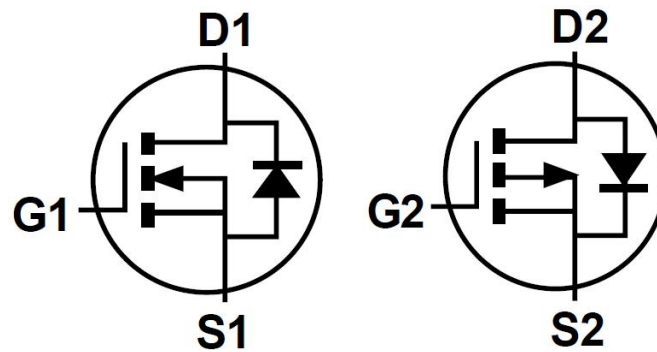
- Motor Control
- Inverters

## Package

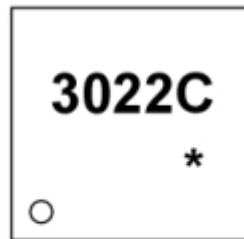


PDFNWB3.3×3.3-8L-B

## Circuit diagram



## Marking



**3022C** = 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	$V_{GS}$	$\pm 20$	$\pm 20$	V
Continuous Drain Current( $t \leq 10\text{s}$ )	$I_D$	8	-7	A
Power Dissipation( $t \leq 10\text{s}$ )	$P_D$	20	16	W
Thermal Resistance from Junction to Ambient( $t \leq 10\text{s}$ )	$R_{\theta JA}$	5.68	6.94	$^{\circ}\text{C}/\text{W}$
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)

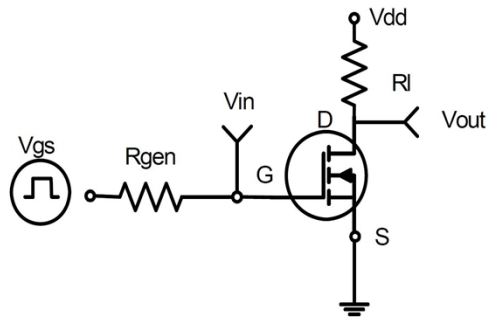
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	BV (BR)DSS	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	30			V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =24V, V <sub>GS</sub> = 0V			1	uA
Gate-body leakage current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V			±100	uA
Gate threshold voltage <sup>(1)</sup>	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1	1.5	2.5	V
Drain-source on-resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =8A		15	19	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =6A		21	28	
Dynamic Characteristics						
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=1MHz		416		pF
Output capacitance	C <sub>oss</sub>			62		
Reverse transfer capacitance	C <sub>rss</sub>			51		
Switching Characteristics						
Total gate charge	Q <sub>g</sub>	V <sub>DS</sub> =15V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =8A		5		nC
Gate-source charge	Q <sub>gs</sub>			1.1		
Gate-drain charge	Q <sub>gd</sub>			2.6		
Turn-on Delay Time	T <sub>d(on)</sub>	V <sub>DD</sub> =15V, V <sub>GS</sub> =10V, R <sub>G</sub> =1.5Ω, I <sub>D</sub> =8A		7.7		nS
Turn-on Rise Time	T <sub>r</sub>			46		
Turn-Off Delay Time	T <sub>d(off)</sub>			11		
Turn-Off Fall Time	t <sub>f</sub>			3.6		
Source-Drain Diode Characteristics						
Body Diode Voltage	V <sub>SD</sub>	I <sub>S</sub> =1A, V <sub>GS</sub> = 0V			1.2	V

## P-Channel Electrical characteristics

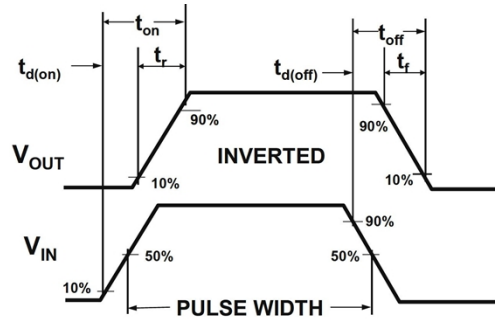
(T<sub>A</sub>=25°C, unless otherwise noted)

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	$\mu A$
Gate-body leakage current	$I_{GSS}$	$V_{GS} = \pm 20V, V_{DS} = 0V$			$\pm 100$	$\mu A$
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1	-1.5	-2.5	V
Drain-source on-resistance	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -8A$		18	23	m $\Omega$
		$V_{GS} = -4.5V, I_D = -6A$		25	34	
Dynamic Characteristics						
Input capacitance	$C_{iss}$	$V_{DS} = -15V, V_{GS} = 0V,$ $f = 1MHz$		1345		pF
Output capacitance	$C_{oss}$			194		
Reverse transfer capacitance	$C_{rss}$			158		
Switching characteristics						
Total gate charge	$Q_g$	$V_{DS} = -15V, V_{GS} = -4.5V,$ $I_D = -8A$		12.6		nC
Gate-source charge	$Q_{gs}$			4.8		
Gate-drain charge	$Q_{gd}$			4.8		
Turn-on Delay Time	$T_{d(on)}$	$V_{DD} = -15V, I_D = -1A,$ $V_{GS} = -10V, R_G = 6\Omega$		4.6		nS
Turn-on Rise Time	$T_r$			14.8		
Turn-Off Delay Time	$T_{d(off)}$			41		
Turn-Off Fall Time	$t_f$			19.6		
Source-Drain Diode Characteristics						
Body Diode Voltage	$V_{SD}$	$I_S = -1A, V_{GS} = 0V$			-1.2	V

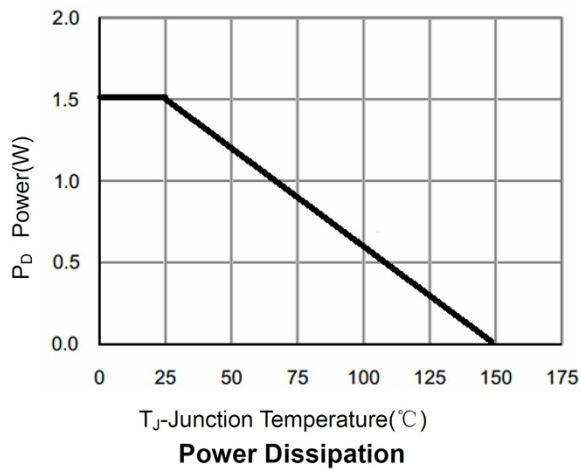
## N-Channel Typical Characteristics



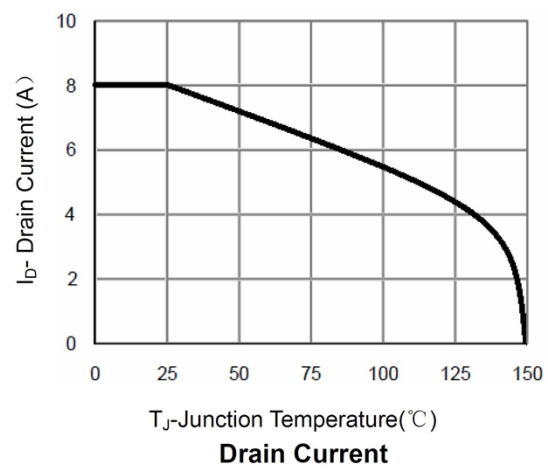
Switching Test Circuit



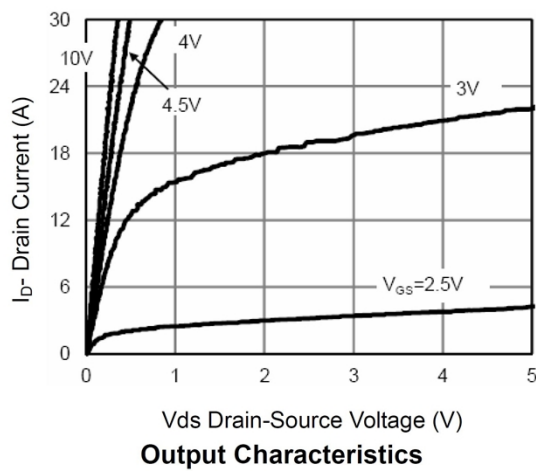
Switching Waveforms



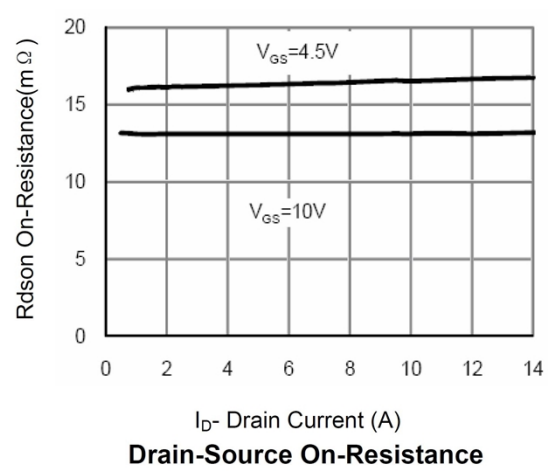
Power Dissipation



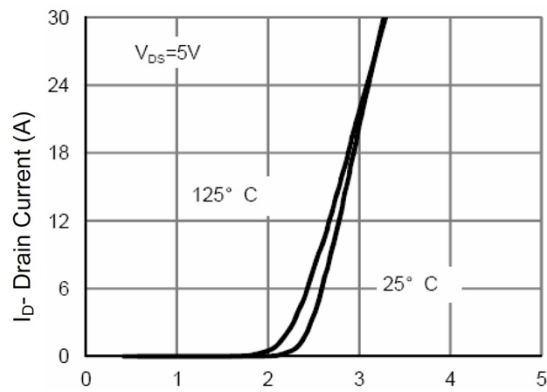
Drain Current



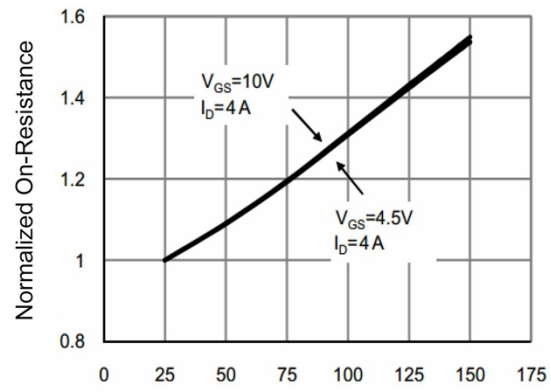
Output Characteristics



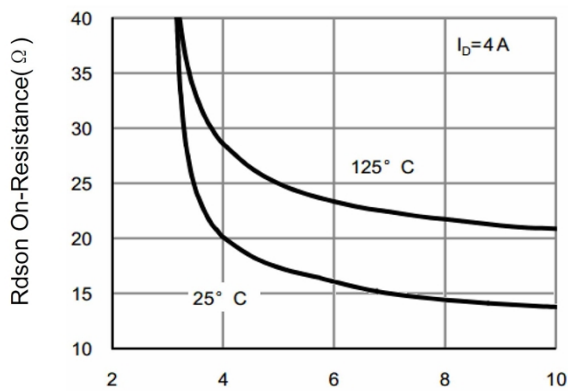
Drain-Source On-Resistance



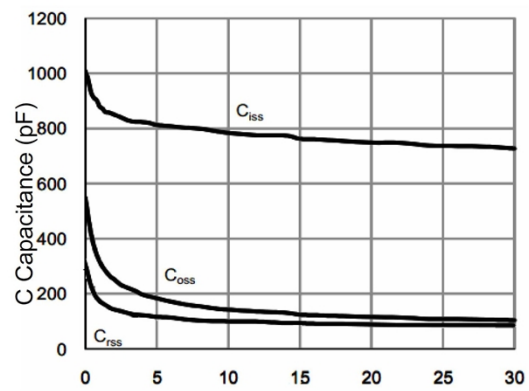
$V_{GS}$  Gate-Source Voltage (V)  
**Transfer Characteristics**



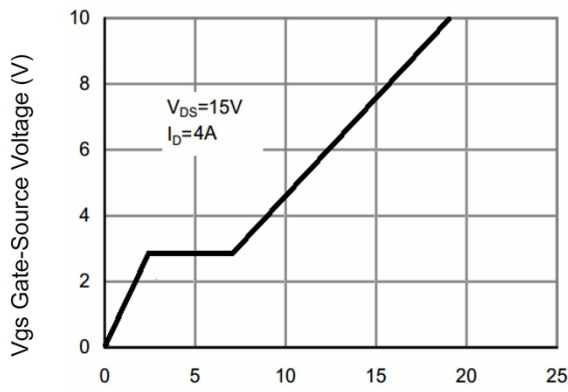
$T_J$  Junction Temperature ( $^\circ C$ )  
**Drain-Source On-Resistance**



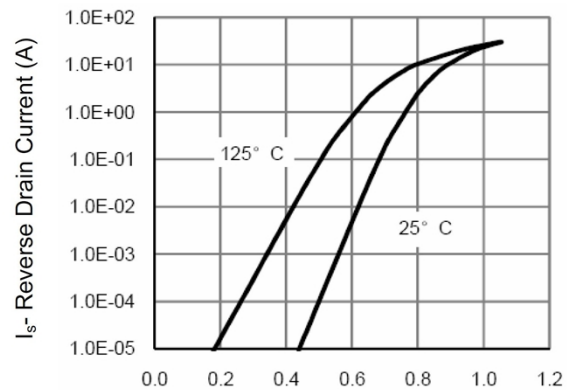
$V_{GS}$  Gate-Source Voltage (V)  
 **$R_{DS(on)}$  vs  $V_{GS}$**



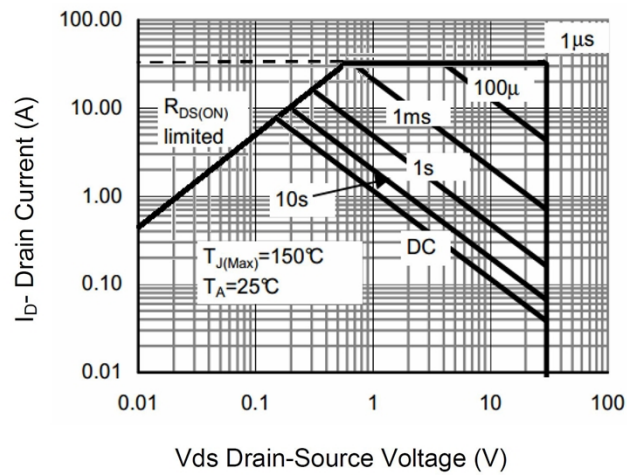
$V_{DS}$  Drain-Source Voltage (V)  
**Capacitance vs  $V_{DS}$**



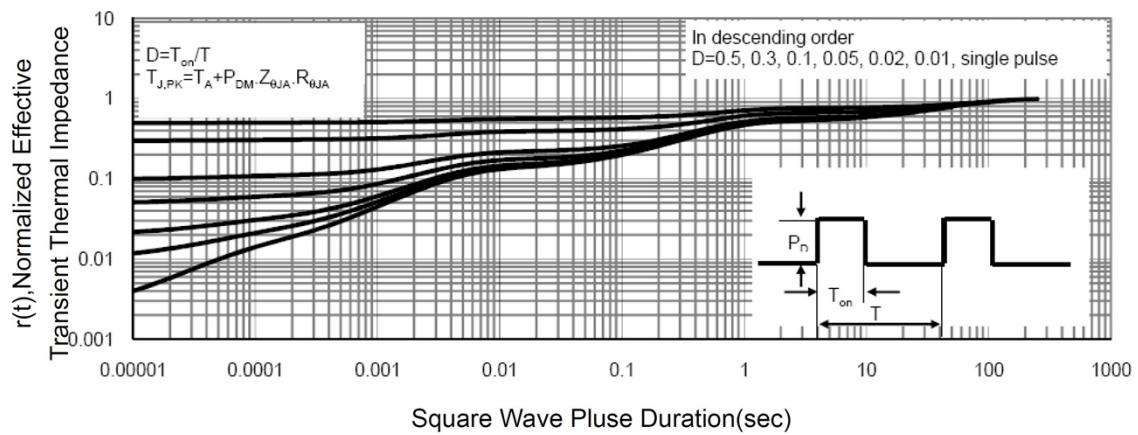
$Q_g$  Gate Charge (nC)  
**Gate Charge**



$V_{SD}$  Source-Drain Voltage (V)  
**Source- Drain Diode Forward**

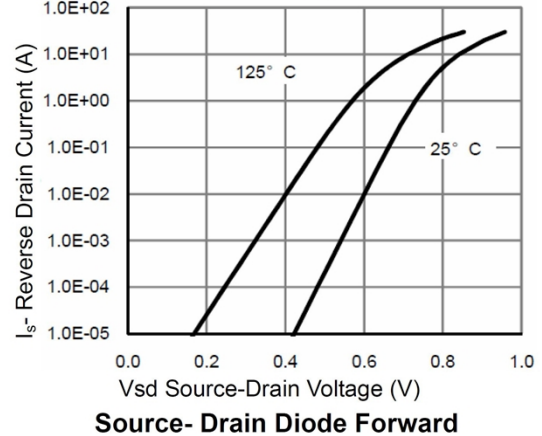
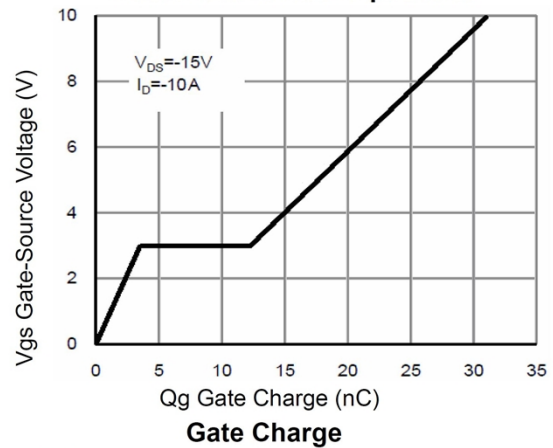
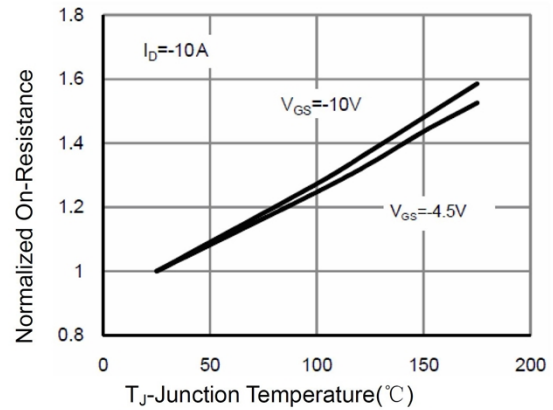
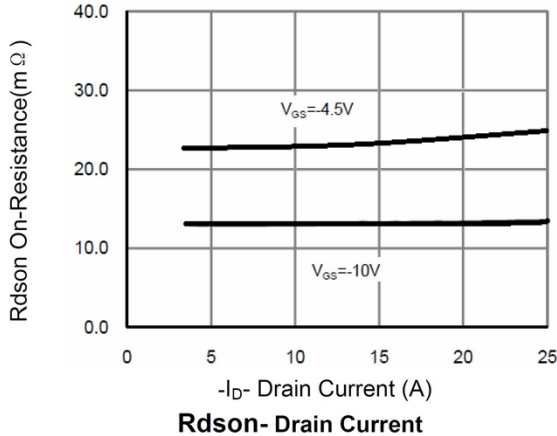
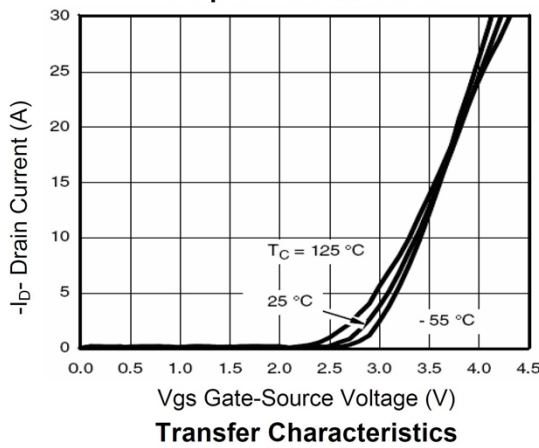
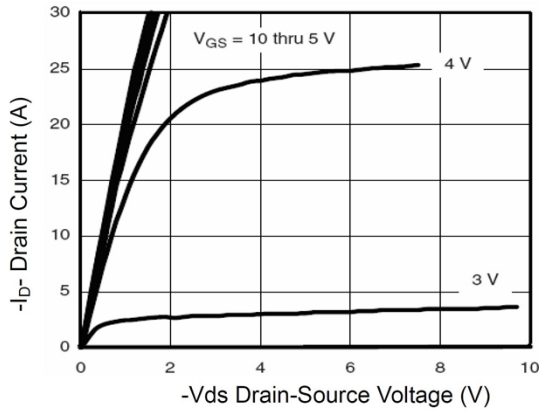


**Safe Operation Area**

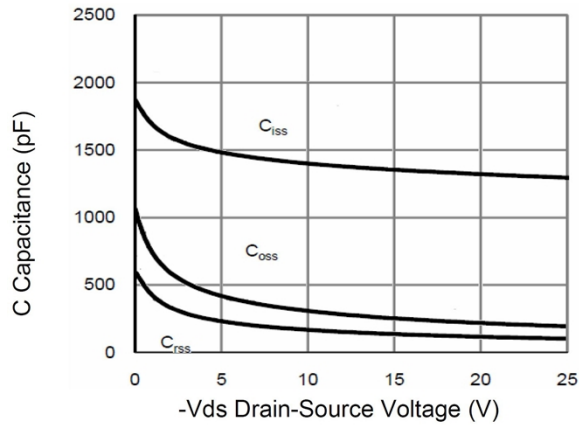


**Normalized Maximum Transient Thermal Impedance**

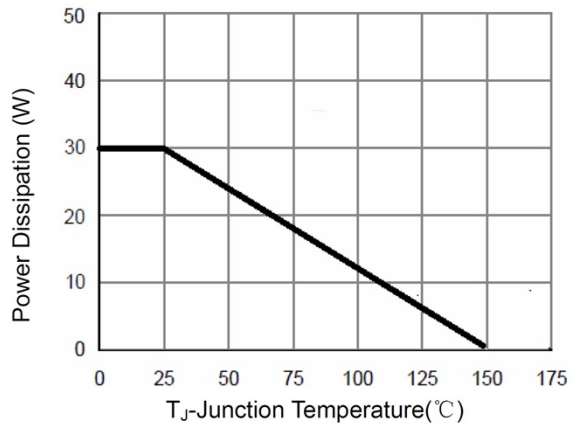
## P-Channel Typical Characteristics



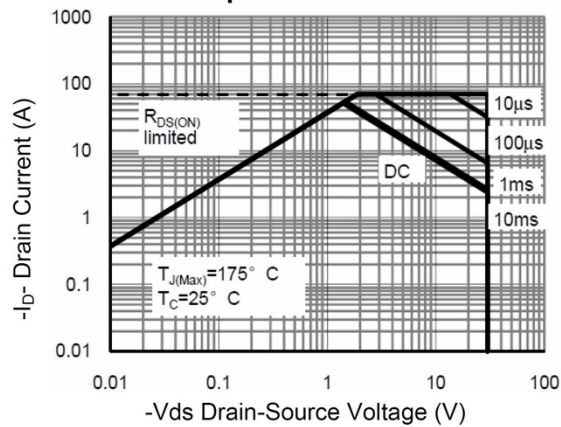




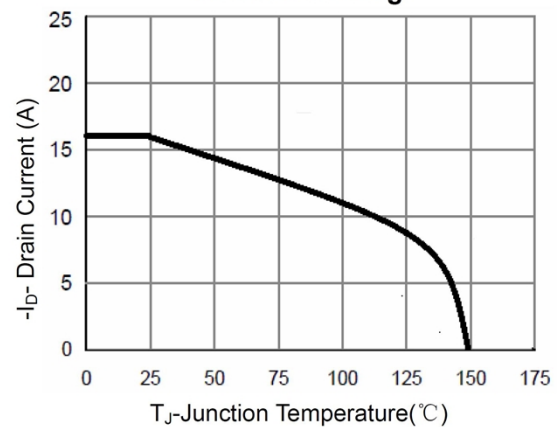
Capacitance vs Vds



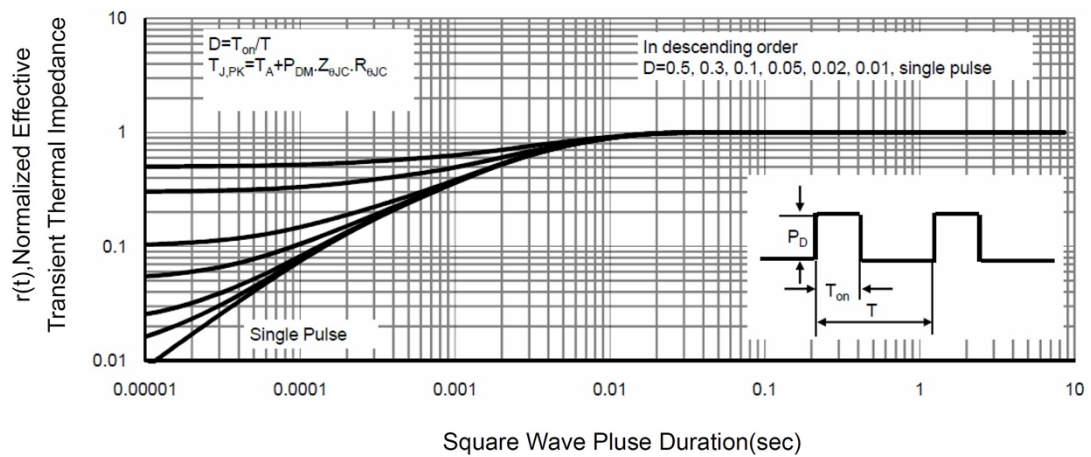
Power De-rating



Safe Operation Area

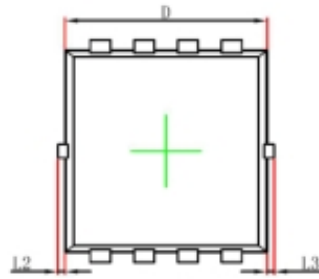


ID Current Derating

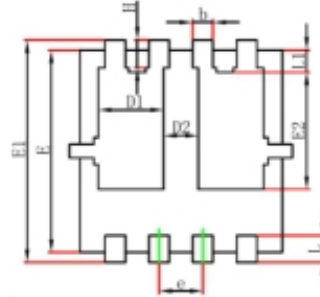


Normalized Maximum Transient Thermal Impedance

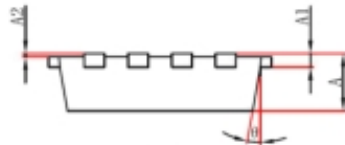
## PDFNWB3.3×3.3-8L-B Package Information



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°