

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	$I_D$
20V	3m $\Omega$ @10V	60A
	3.5m $\Omega$ @4.5V	

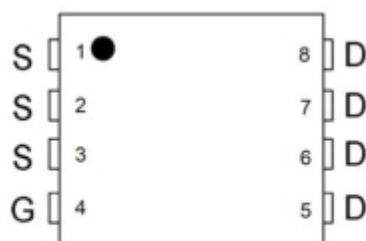
## Feature

- $V_{DS} = 20V, I_D = 50A$
- $R_{DS(ON)} < 4.5m\Omega @ V_{GS} = 10V$
- High density cell design for ultra low  $R_{dson}$
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high  $E_{AS}$
- Excellent package for good heat dissipation
- Special process technology for high ESD capability

## Applications

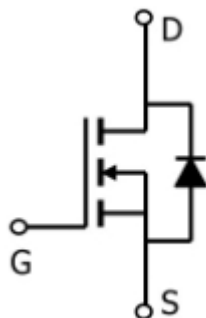
- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

## Package

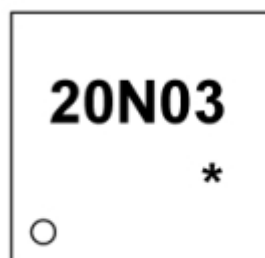


**PDFNWB3.3×3.3-8L**

## Circuit diagram



## Marking



20N03 =Device Code  
\* =Month Code

## Absolute maximum ratings

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DS</sub>	20	V
Gate-Source Voltage	V <sub>GS</sub>	±10	V
Drain Current-Continuous	I <sub>D</sub>	60	W
Pulsed Drain Current	I <sub>DM</sub>	240	A
Single Pulse Avalanche Energy	E <sub>AS</sub>	40	mJ
Power Dissipation	P <sub>D</sub>	83	W
Thermal Resistance Junction- Case	R <sub>θJC</sub>	1.47	°C/ W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55~ +175	°C

## 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	$BV_{DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	20			V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = 20V, V_{GS} = 0V$			1	$\mu A$
Gate-body leakage current	$I_{GSS}$	$V_{GS} = \pm 10V, V_{DS} = 0V$			$\pm 100$	$\mu A$
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	0.4	0.62	1	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = 4.5V, I_D = 10A$		3	4.5	m $\Omega$
		$V_{GS} = 2.5V, I_D = 6A$		3.5	5.5	
Dynamic characteristics <sup>4</sup>						
Input Capacitance	$C_{iss}$	$V_{DS} = 10V, V_{GS} = 0V,$ $f = 1MHz$		3935		pF
Output Capacitance	$C_{oss}$			701		
Reverse Transfer Capacitance	$C_{rss}$			333		
Switching Characteristics						
Total Gate Charge(4.5V)	$Q_g$	$V_{GS} = 4.5V, V_{DS} = 10V,$ $I_D = 15A$		105		nC
Gate-Source Charge	$Q_{gS}$			25		
Gate-Drain Charge	$Q_{gd}$			21		
Turn-On Delay Time	$T_{d(on)}$	$V_{GS} = 4.5V, V_{DD} = 10V,$ $I_D = 10A, R_L = 1\Omega,$ $R_{GEN} = 3\Omega$		12		nS
Rise Time	$T_r$			26		
Turn-Off Delay Time	$T_{d(off)}$			35		
Fall Time	$T_f$			10		
Drain-Source Diode Characteristics						
Diode Forward Voltage	$V_{SD}$	$I_S = 20A, V_{GS} = 0V$		0.8	1.2	V
Maximum Body-Diode Continuous Current	$I_S$				60	A

## Typical Characteristics

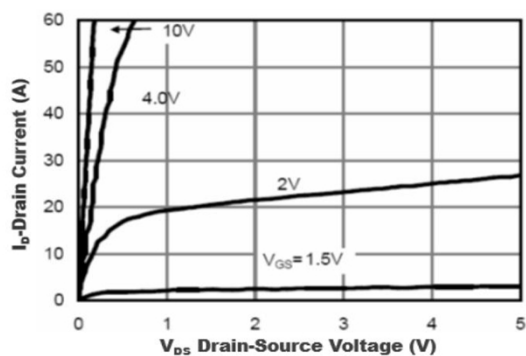


Figure1. Output Characteristics

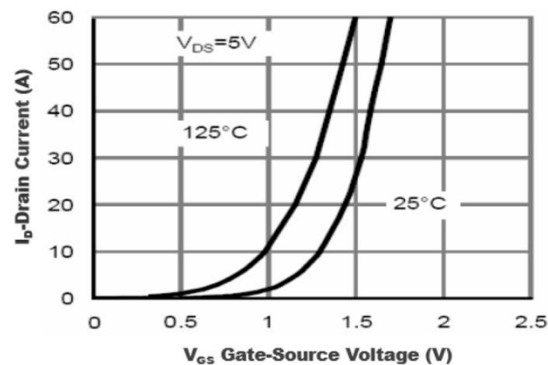


Figure2. Transfer Characteristics

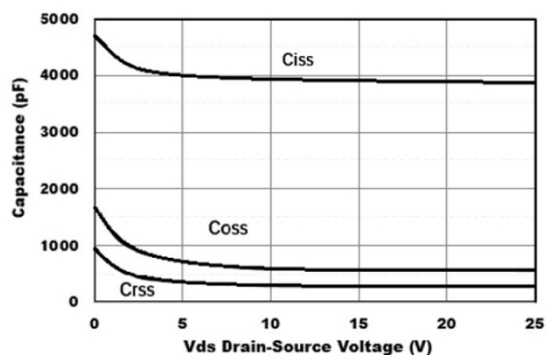


Figure3. Capacitance Characteristics

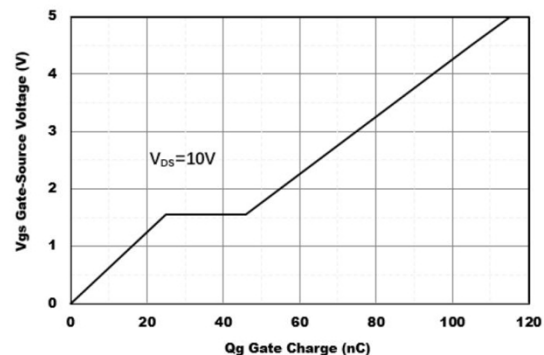


Figure4. Gate Charge

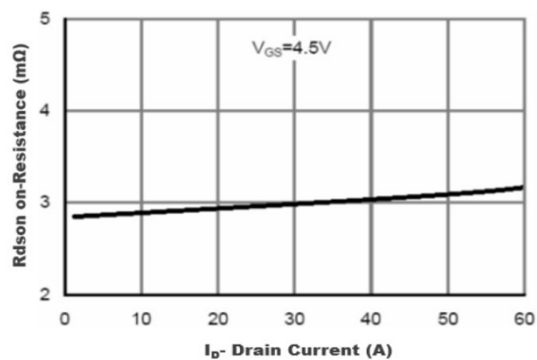


Figure5. Drain-Source on Resistance

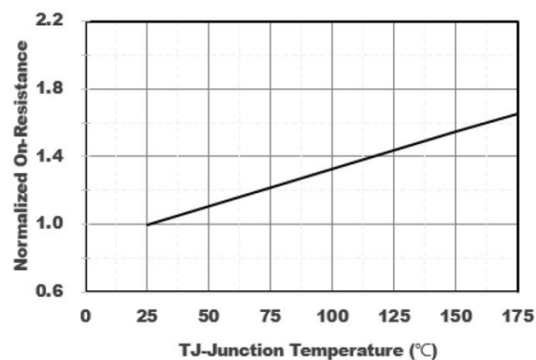


Figure6. Drain-Source on Resistance

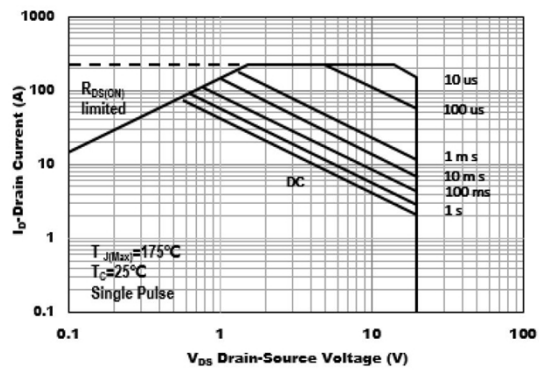


Figure7. Safe Operation Area

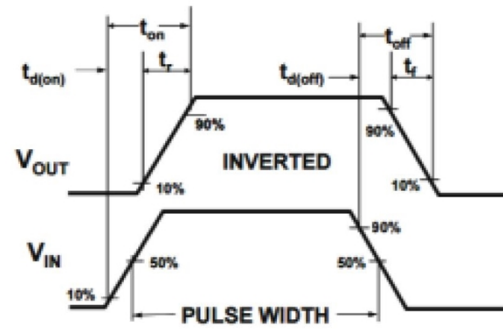
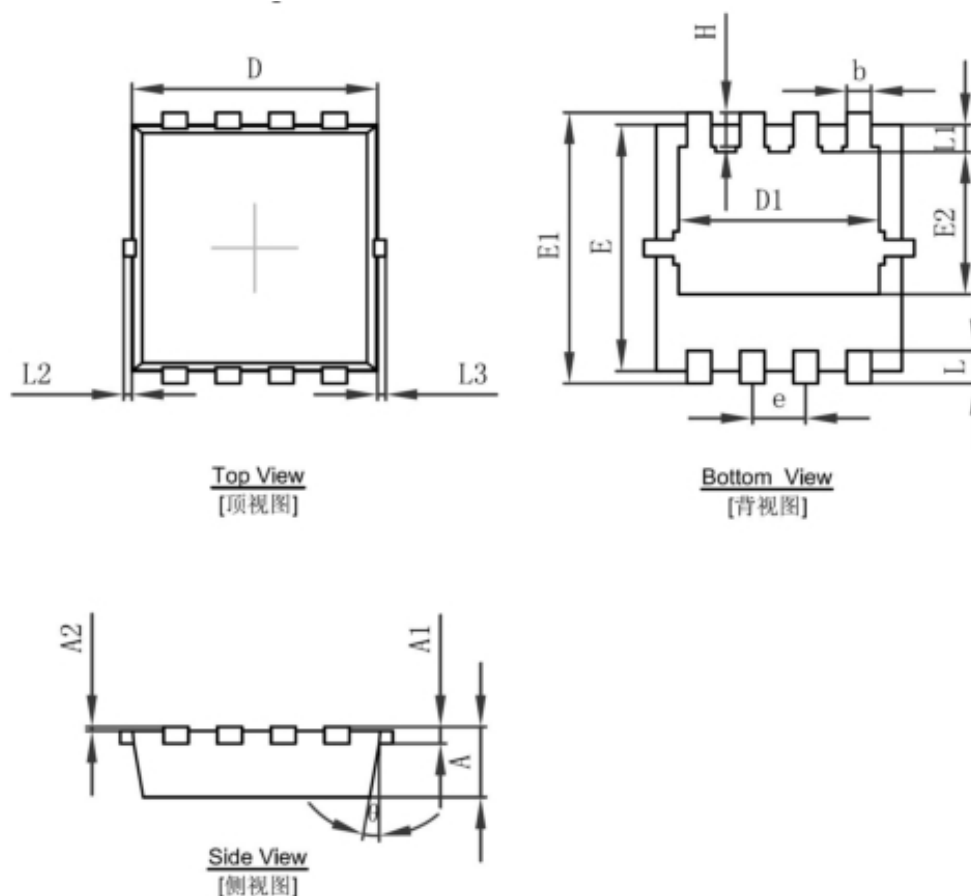


Figure8. Switching wave

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



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	2.300	2.600	0.091	0.102
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°