



# CC20N06P33 N-Channel MOSFET

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	$I_D$
60V	26mΩ@10V	20A

## Description

The CC20N06P33 provides excellent  $R_{DS(ON)}$  with low gate charge. It can be used in a wide variety of applications .

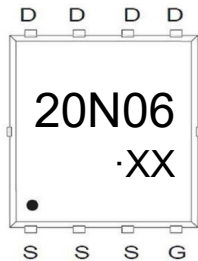
## Feature

- High density cell design for ultra low  $R_{ds(on)}$
- 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

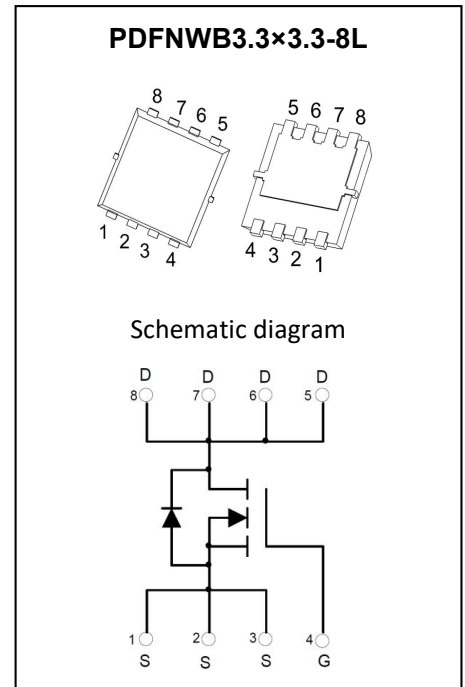
## Application

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible Power Supply
- AEC-Q101 Qualified

## MARKING



20N06 = Device code  
 Solid dot = Pin1 indicator  
 XX = Date Code



## ABSOLUTE MAXIMUM RATINGS ( $T_C=25^{\circ}C$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	±20	V
Continuous Drain Current	$I_D$	20	A
Pulsed Drain Current	$I_{DM}$	80	A
Single Pulse Avalanche Energy <sup>5</sup>	$E_{AS}$	72	mJ
Total Power Dissipation	$P_D$	35	W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	4.3	$^{\circ}C/W$
Junction Temperature	$T_J$	175	$^{\circ}C$
Storage Temperature	$T_{STG}$	-55~ +175	$^{\circ}C$

**MOSFET ELECTRICAL CHARACTERISTICS(T<sub>c</sub>=25°C unless otherwise noted)**

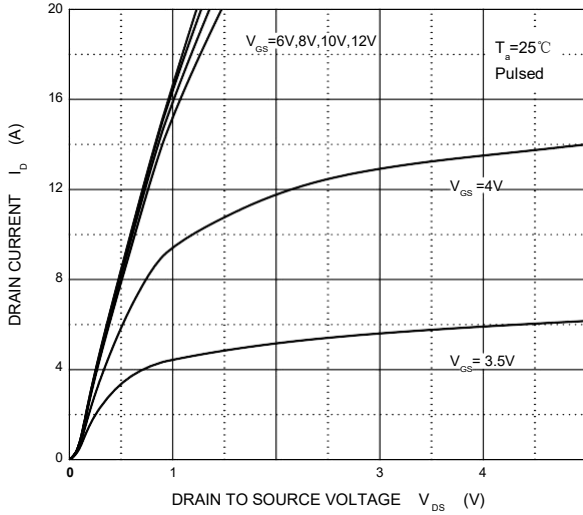
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	60			V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =60V, V <sub>GS</sub> = 0V			1	μA
Gate-body leakage current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> = 0V			±100	nA
Gate threshold voltage <sup>3</sup>	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1	2	3	V
Drain-source on-resistance <sup>3</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =10A		26	35	mΩ
Forward tranconductance <sup>3</sup>	g <sub>FS</sub>	V <sub>DS</sub> =6V, I <sub>D</sub> =10A	18			S
<b>Dynamic characteristics<sup>4</sup></b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V, f =1MHz		960		pF
Output Capacitance	C <sub>oss</sub>			62		
Reverse Transfer Capacitance	C <sub>rss</sub>			54		
<b>Switching Characteristics<sup>4</sup></b>						
Total Gate Charge@-4.5V	Q <sub>g</sub>	V <sub>DS</sub> =48V , V <sub>GS</sub> =10V , I <sub>D</sub> =15A		12		nC
Gate-Source Charge	Q <sub>gs</sub>			4.1		
Gate-Drain Charge	Q <sub>gd</sub>			4.5		
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> =30V , V <sub>GS</sub> =10V , R <sub>L</sub> =15Ω , R <sub>G</sub> =2.5Ω		5		ns
Turn-on rise time	t <sub>r</sub>			2.6		
Turn-off delay time	t <sub>d(off)</sub>			17		
Turn-off fall time	t <sub>f</sub>			2.5		
<b>Diode Characteristics</b>						
Continuous Source Current <sup>2</sup>	I <sub>S</sub>	V <sub>G</sub> =V <sub>D</sub> =0V , Force Current			20	A
Diode Forward Voltage <sup>3</sup>	V <sub>SD</sub>	V <sub>GS</sub> =0V , I <sub>S</sub> =1A , T <sub>J</sub> =25°C		0.72	1.2	V

Note :

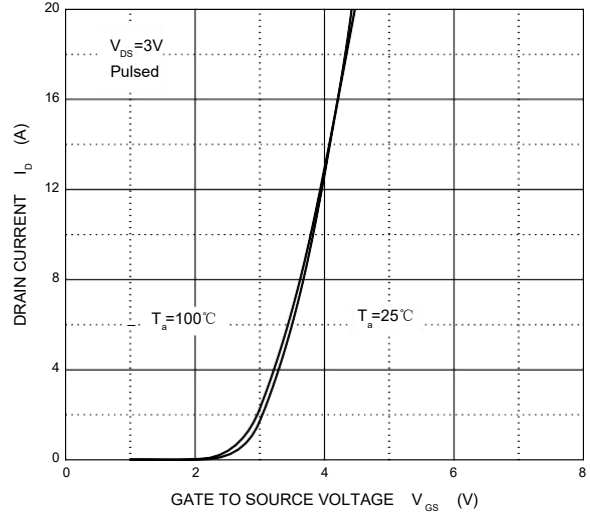
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production
5. EAS condition : T<sub>j</sub>=25°C, V<sub>DD</sub>=30V, V<sub>G</sub>=10V, L=0.5mH, R<sub>G</sub>=25Ω

# Typical Characteristics

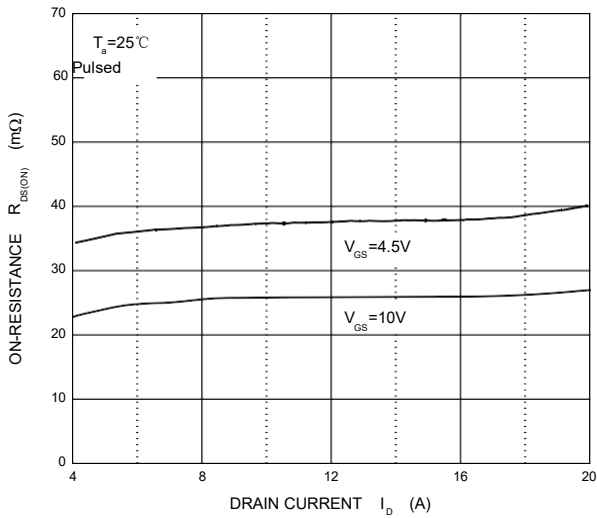
Output Characteristics



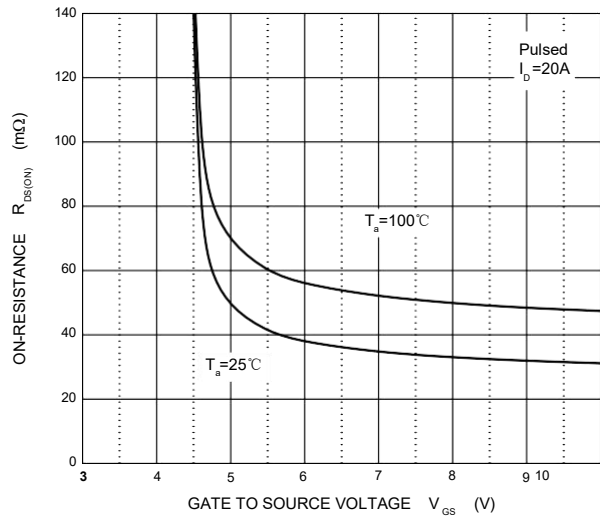
Transfer Characteristics



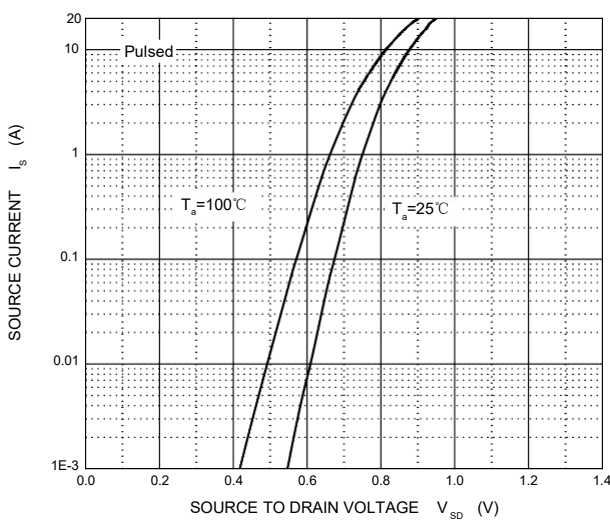
$R_{DS(ON)}$  —  $I_D$



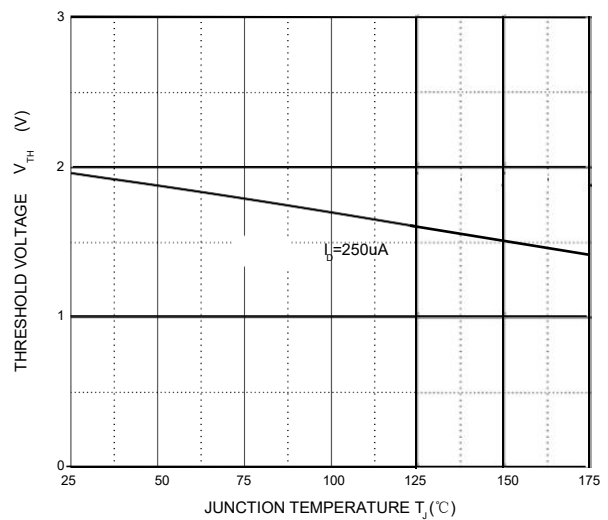
$R_{DS(ON)}$  —  $V_{GS}$



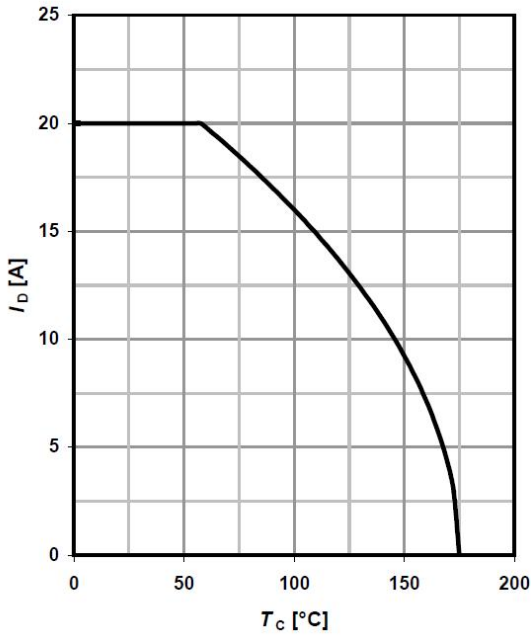
$I_S$  —  $V_{SD}$



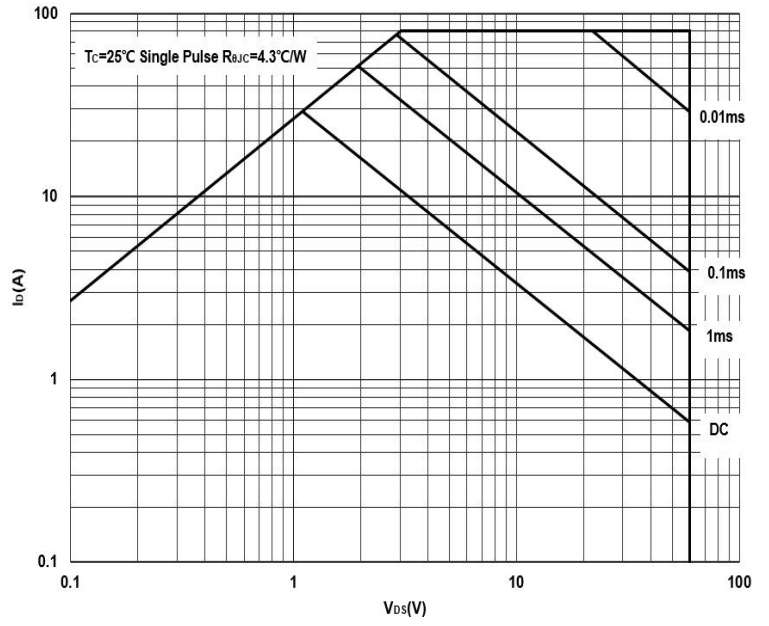
Threshold Voltage



ID—Tc

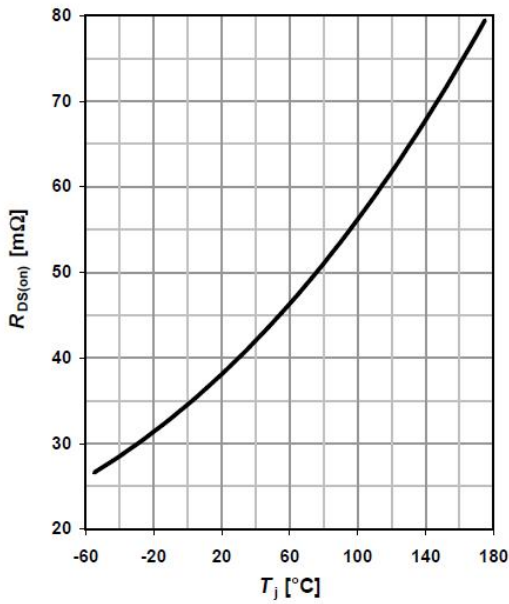


Safe operating area

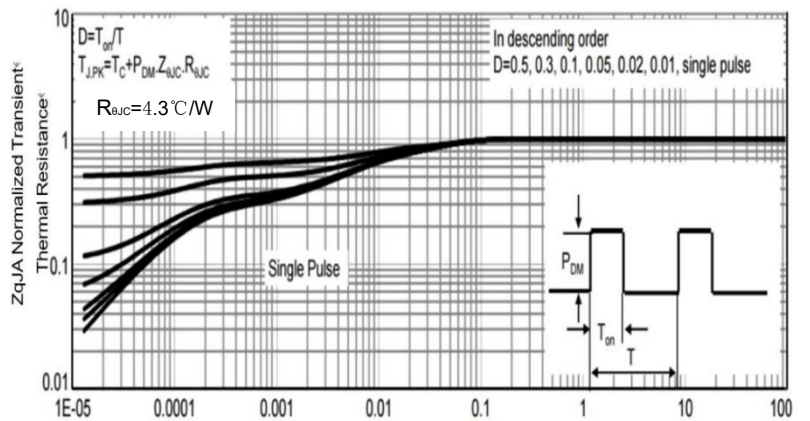


Drain-source on-state resistance(RDS(on))

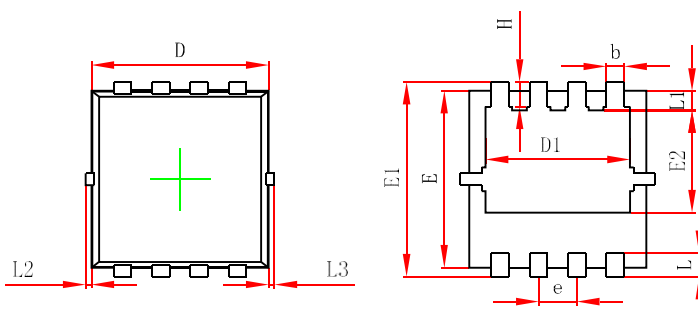
$$R_{DS(on)} = f(T_j); I_D = 15 \text{ A}; V_{GS} = 10 \text{ V}$$



Normalized Thermal Transient Impedance

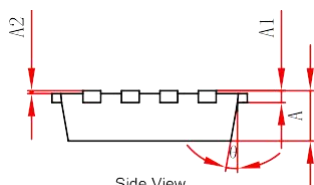


# PDFNWB3.3×3.3-8L Package Outline Dimension



Top View  
[顶视图]

Bottom View  
[背视图]



Side View  
[侧视图]

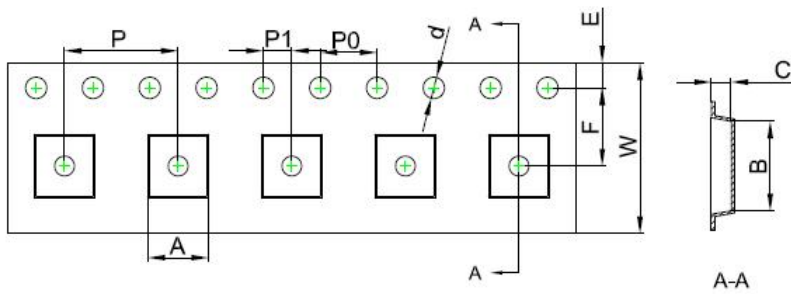
Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min.	Max.	Min.	Max.
A	0.650	0.850	0.026	0.033
A1	0.152 REF.		0.006 REF.	
A2	0~0.05		0~0.002	
D	2.900	3.100	0.114	0.122
D1	2.300	2.600	0.091	0.102
E	2.900	3.100	0.114	0.122
E1	3.150	3.450	0.124	0.136
E2	1.535	1.935	0.060	0.076
b	0.200	0.400	0.008	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°	

## NOTICE

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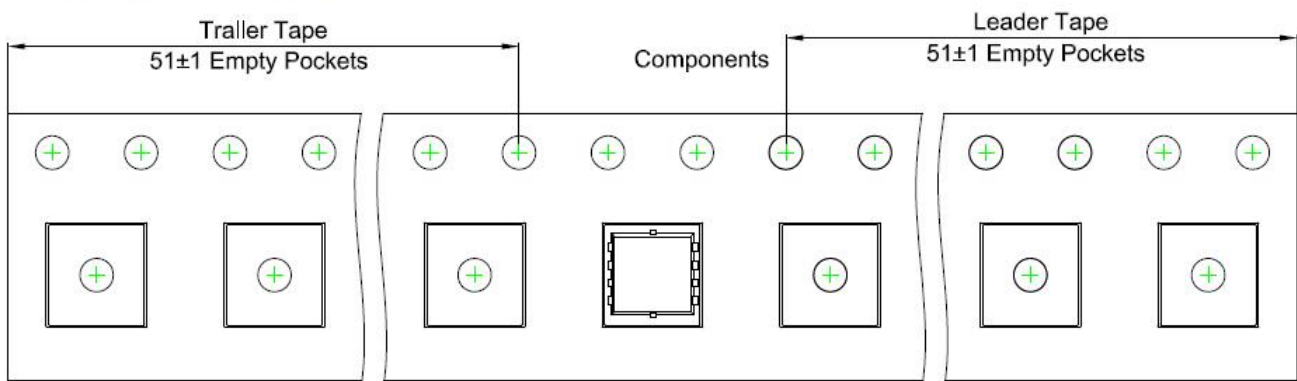
# PDFNWB3.3×3.3-8L Embossed Carrier Tape



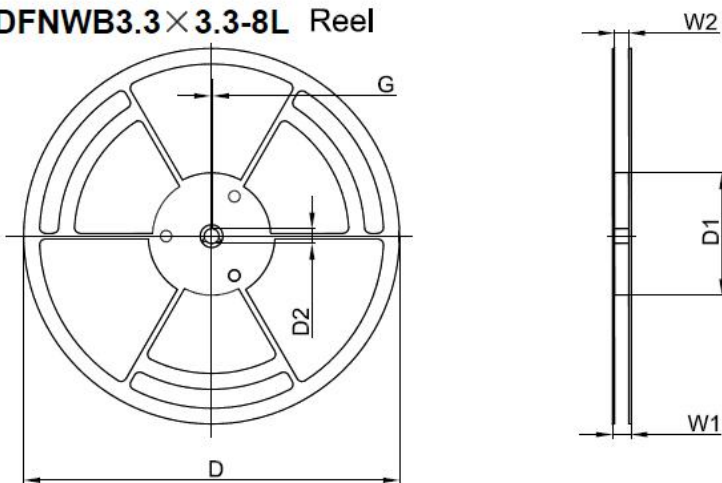
Dimensions are in millimeter

Pkg type	A	B	C	d	E	F	P0	P	P1	W
PDFNWB3.3×3.3-8L	3.55	3.55	1.10	Ø1.50	1.75	5.50	4.00	8.00	2.00	12.00

## PDFNWB3.3×3.3-8L Tape Leader and Trailer



## PDFNWB3.3×3.3-8L Reel



Dimensions are in millimeter

Reel Option	D	D1	D2	G	W1	W2
13"D1a	Ø330.00	100.00	13.00	1.90	17.60	12.40

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)
5,000 pcs	13 Inch	5,000 pcs	340×336×29	50,000 pcs	353×346×365

Date of change	Rev #	revise content
2023/2/22	A/0	/