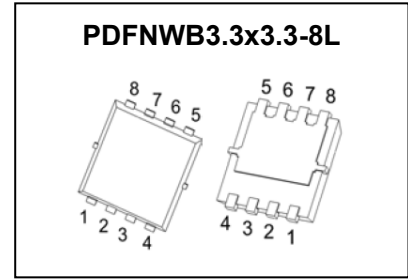


**CJAB5R0SN03A** N-Channel Power MOSFET

**Key Performance Parameters**

<b>V<sub>BR(DSS)</sub></b>	<b>R<sub>DS(on)</sub>TYP</b>	<b>I<sub>D</sub></b>
<b>30V</b>	<b>3.6mΩ@10V</b>	<b>80A</b>
	<b>5.5mΩ@4.5V</b>	



**DESCRIPTION**

The N-Channel enhancement mode power field effect transistors is using SGT technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance. These devices are well suited for high efficiency fast switching applications.

**FEATURES**

- 100% Avalanche Tested
- Low drain-source on-resistance:  
R<sub>DS(ON)</sub> = 3.6 mΩ (typ.) (V<sub>GS</sub> = 10V)
- Excellent package for good heat dissipation

**APPLICATIONS**

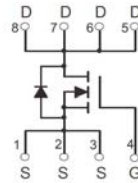
- High-Efficiency DC-DC Converters
- Switching Voltage Regulators
- Motor Drivers

**MARKING**



XXXXX = 5R0SN03A  
Solid dot = Pin1 indicator.  
YY = Code.

**EQUIVALENT CIRCUIT**



**ABSOLUTE MAXIMUM RATINGS ( T<sub>J</sub>=25°C unless otherwise specified )**

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DS</sub>	30	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current	I <sub>D</sub>	T <sub>C</sub> = 25°C	80
		T <sub>C</sub> = 100°C	50.6
Pulsed Drain Current	I <sub>DM</sub> <sup>①②</sup>	320	A
Continuous Drain Current	I <sub>D</sub>	T <sub>A</sub> = 25°C	15.9
		T <sub>A</sub> = 75°C	12.3
Avalanche Current	I <sub>AS</sub> <sup>③</sup>	10	A
Single Pulsed Avalanche Energy	E <sub>AS</sub> <sup>③</sup>	25	mJ
Power Dissipation	P <sub>D</sub> <sup>①</sup>	52	W
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-55~+150	°C

**Thermal Characteristics**

Parameter	Symbol	Value		Unit
		Typ	Max	
Thermal Resistance from Junction to Case	R <sub>θJC</sub>	1.6	2.4	°C/W
Thermal Resistance from Junction to Ambient	R <sub>θJA</sub> <sup>⑥</sup>	50	62.5	°C/W

# Typical Characteristics

## ELECTRICAL CHARACTERISTICS (T<sub>J</sub>=25°C unless otherwise specified)

### Static Characteristics

Parameter	Symbol	Test Condition	Value			Unit	
			Min	Typ	Max		
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	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> = 30V, V <sub>GS</sub> = 0V	T <sub>J</sub> = 25°C	-	-	1.0	μA
			T <sub>J</sub> = 125°C	-	-	100	
Gate-body leakage current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V	-	-	±100	nA	
Gate-threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	1.4	1.8	2.2	V	
Static drain-source on-state resistance	R <sub>DS(on)</sub> <sup>④</sup>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 20A	T <sub>J</sub> = 25°C	-	3.6	5.0	mΩ
			T <sub>J</sub> = 125°C	-	5.2	7.2	
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 20A	-	5.5	7.8		
Forward transconductance	g <sub>FS</sub>	V <sub>DS</sub> = 5V, I <sub>D</sub> = 20A	-	80	-	S	

### Dynamic Characteristics<sup>⑤</sup>

Input capacitance	C <sub>iss</sub>	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 15V, f = 1MHz	-	789	-	pF
Output capacitance	C <sub>oss</sub>		-	595	-	
Reverse transfer capacitance	C <sub>rss</sub>		-	17	-	
Gate resistance	R <sub>g</sub>	f = 1MHz	-	2.0	-	Ω
Total gate charge	Q <sub>g</sub>	V <sub>GS</sub> = 4.5V, V <sub>DS</sub> = 15V, I <sub>D</sub> = 20A	-	5.0	-	nC
Total gate charge	Q <sub>g</sub>	V <sub>GS</sub> = 10V, V <sub>DS</sub> = 15V, I <sub>D</sub> = 20A	-	11	-	
Gate charge at threshold	Q <sub>G(th)</sub>		-	1.6	-	
Gate-source charge	Q <sub>gs</sub>		-	2.3	-	
Gate-drain charge	Q <sub>gd</sub>		-	1.2	-	
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> = 15V, V <sub>GS</sub> = 10V, I <sub>D</sub> = 20A, R <sub>g</sub> = 3Ω	-	3.4	-	ns
Turn-on rise time	t <sub>r</sub>		-	2.1	-	
Turn-off delay time	t <sub>d(off)</sub>		-	10.7	-	
Turn-off fall time	t <sub>f</sub>		-	1.8	-	

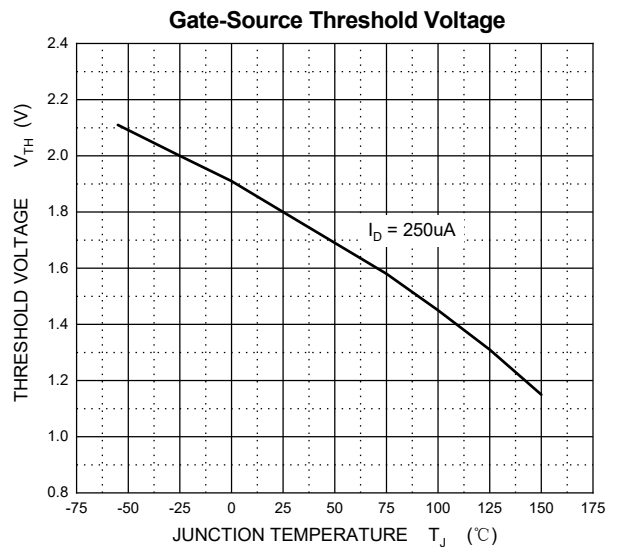
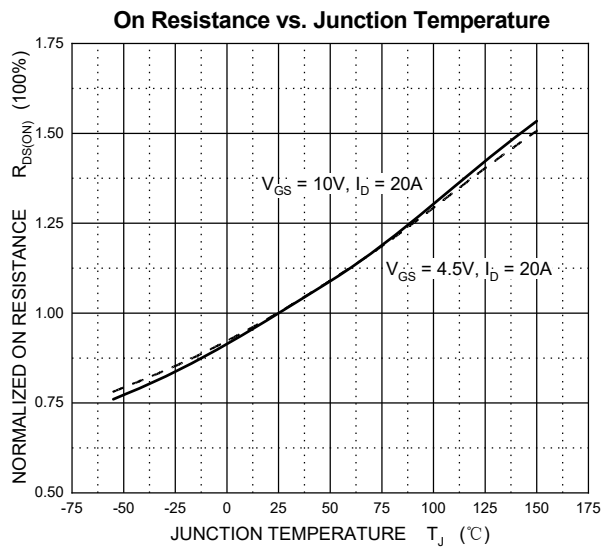
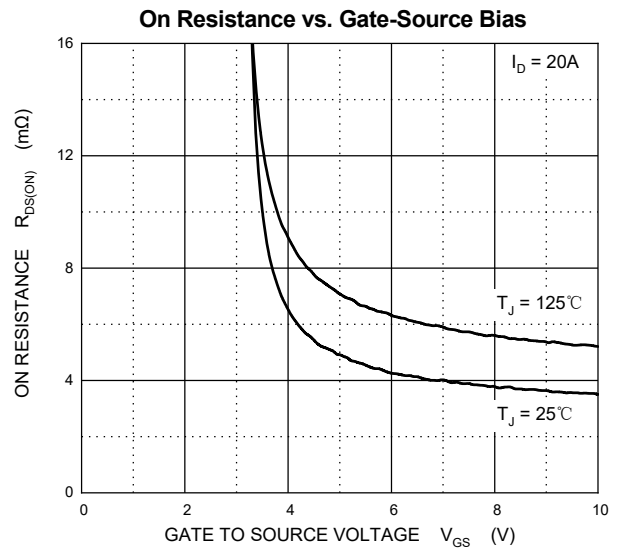
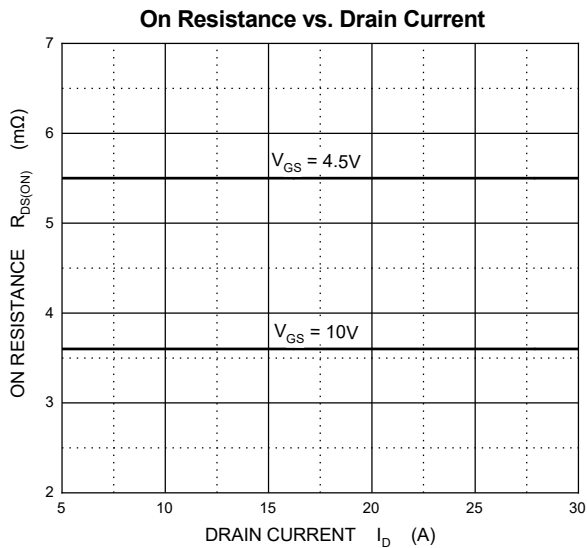
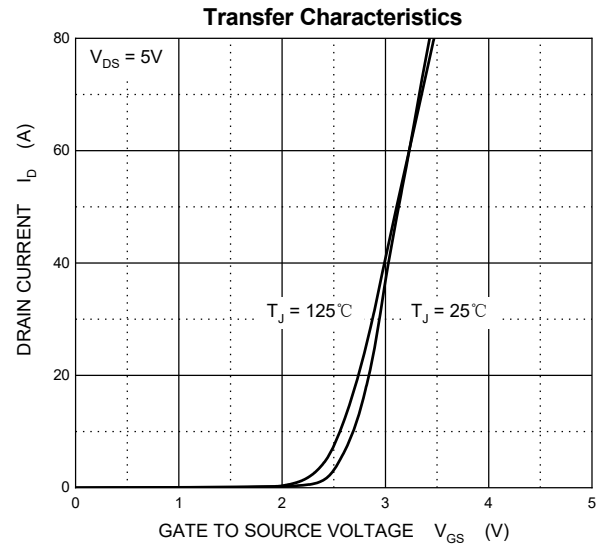
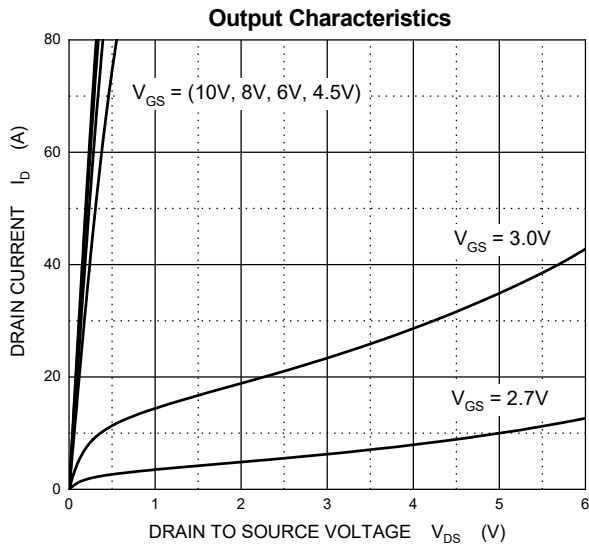
### Reverse Diode Characteristics

Drain-source diode forward voltage	V <sub>SD</sub> <sup>④</sup>	V <sub>GS</sub> = 0V, I <sub>S</sub> = 20A	-	-	1.2	V
Continuous drain-source diode forward current	I <sub>S</sub> <sup>①</sup>		-	-	80	A
Pulsed drain-source diode forward current	I <sub>SM</sub> <sup>①②</sup>		-	-	320	A
Reverse recovery time	t <sub>rr</sub>	V <sub>DD</sub> = 15V, I <sub>S</sub> = 20A,	-	10.9	-	ns
Reverse recovery charge	Q <sub>rr</sub>	di/dt = 500A/μs	-	16.2	-	nC

Notes:

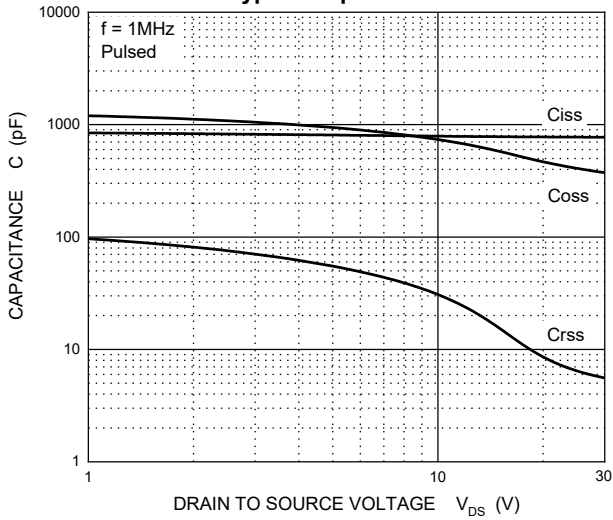
- ①. T<sub>c</sub> = 25°C Limited only by maximum temperature allowed.
- ②. P<sub>w</sub> ≤ 10μs, Duty cycle ≤ 1%.
- ③. EAS condition: V<sub>DD</sub> = 15V, V<sub>GS</sub> = 10V, L = 0.5mH, R<sub>g</sub> = 25Ω Starting T<sub>J</sub> = 25°C.
- ④. Pulse Test : Pulse Width ≤ 380μs, duty cycle ≤ 2%.
- ⑤. Guaranteed by design, not subject to production.
- ⑥. Device mounted on 1 in<sup>2</sup> FR-4 board with 2oz. double-sided Copper, in a still air environment with T<sub>A</sub> = 25°C.

# Typical Characteristics

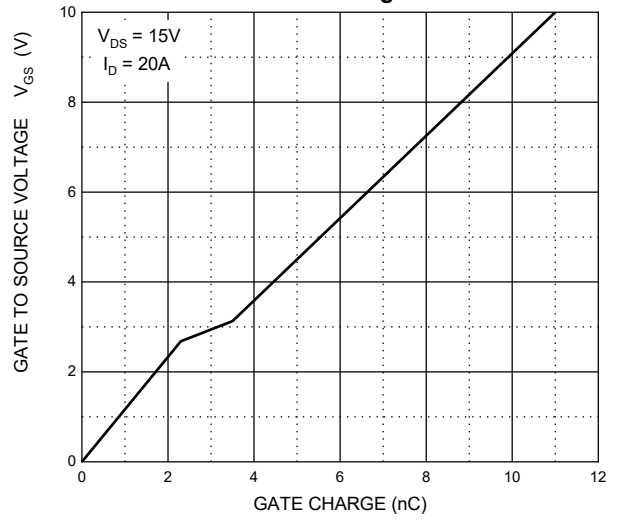


# Typical Characteristics

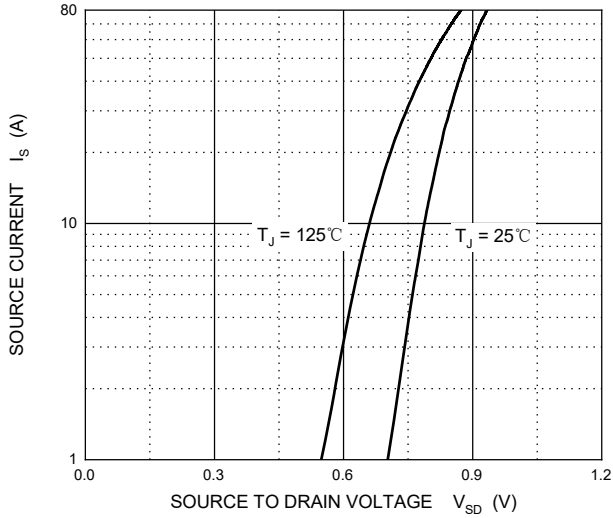
**Typical Capacitances**



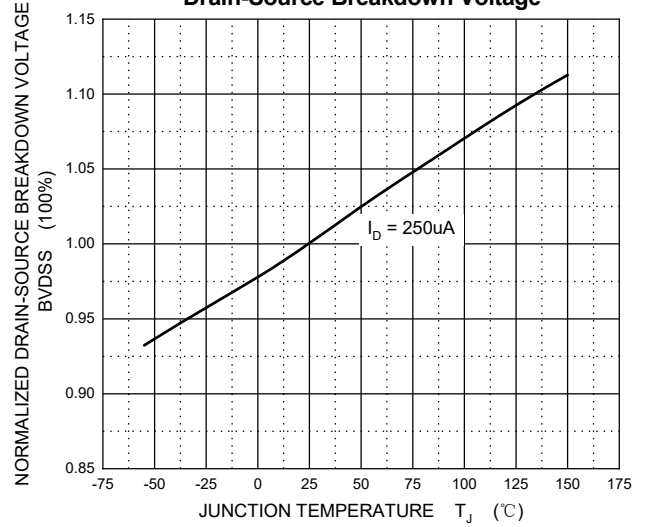
**Gate Charge**



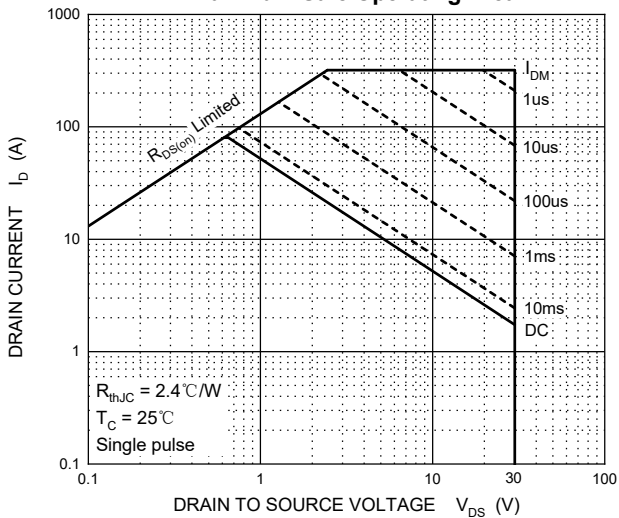
**Source-Drain Diode Forward Characteristics**



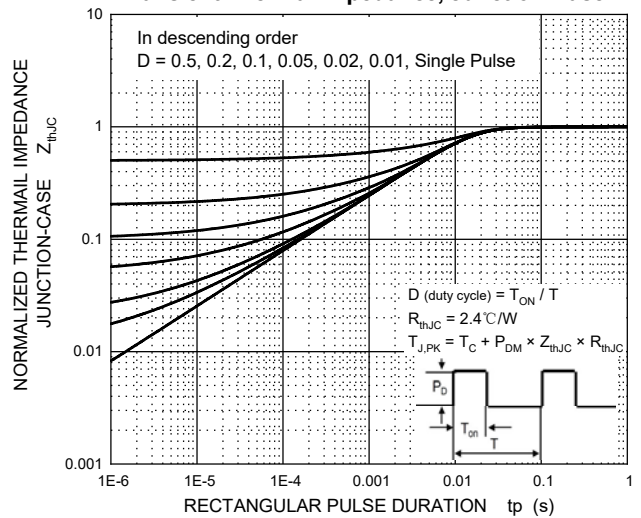
**Drain-Source Breakdown Voltage**



**Maximum Safe Operating Area**

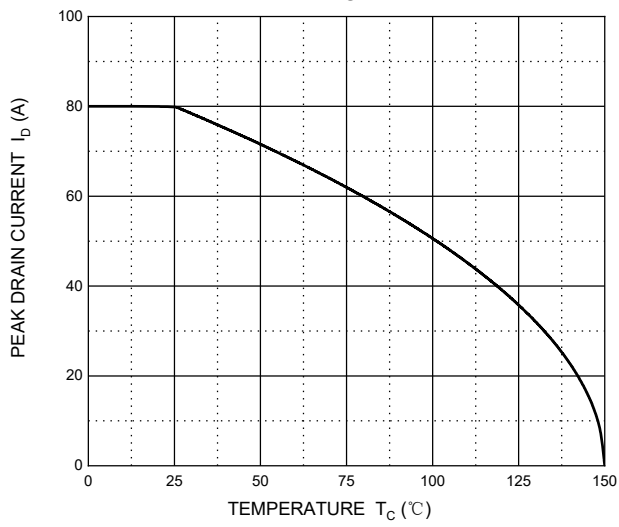


**Transient Thermal Impedance, Junction-Case**

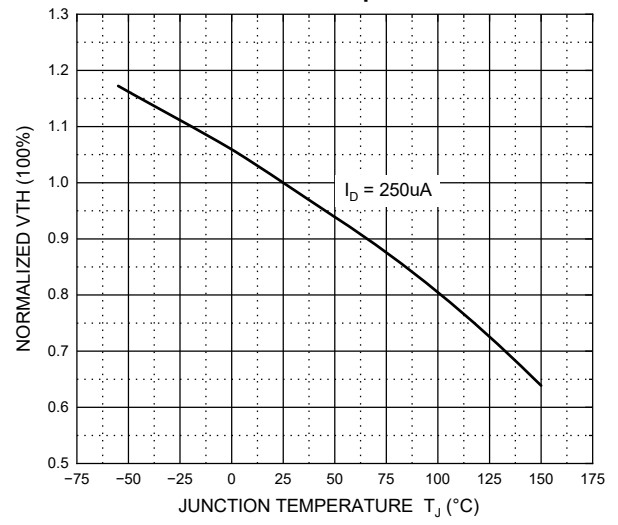


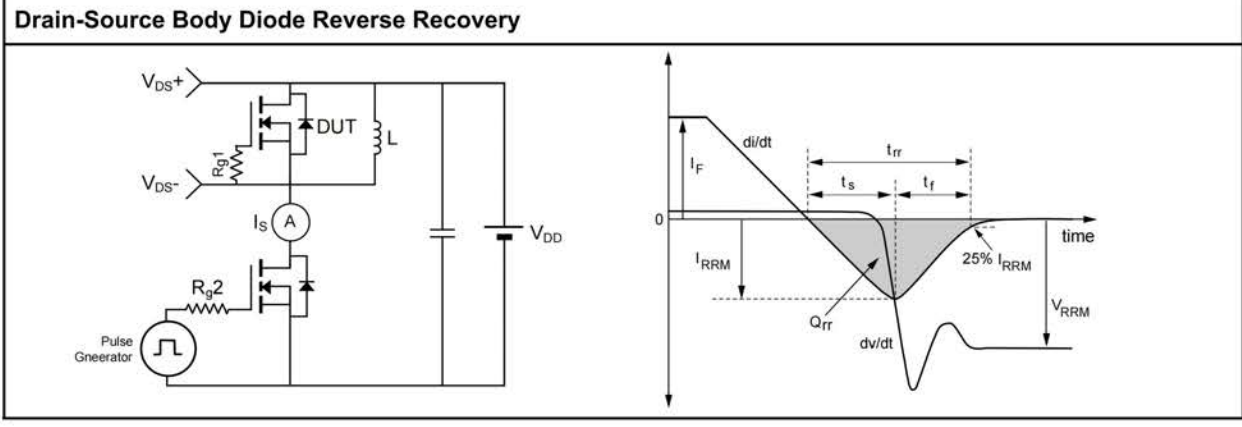
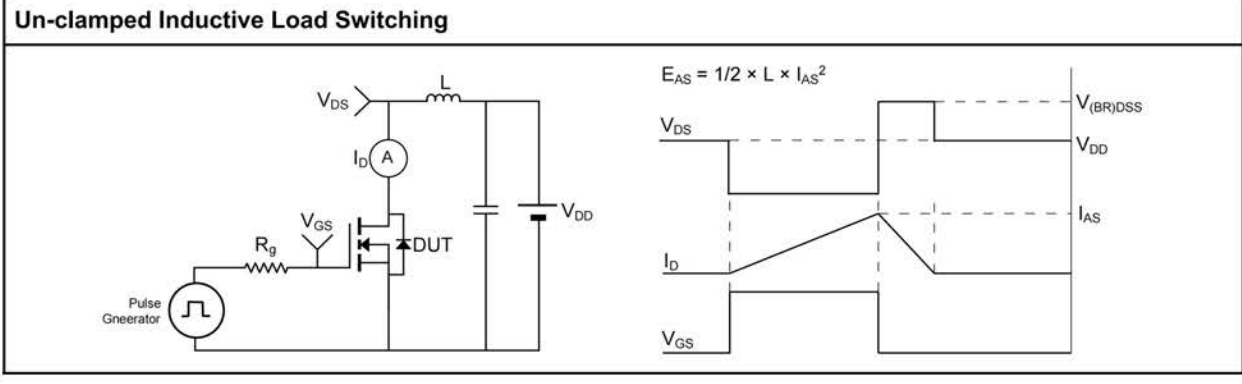
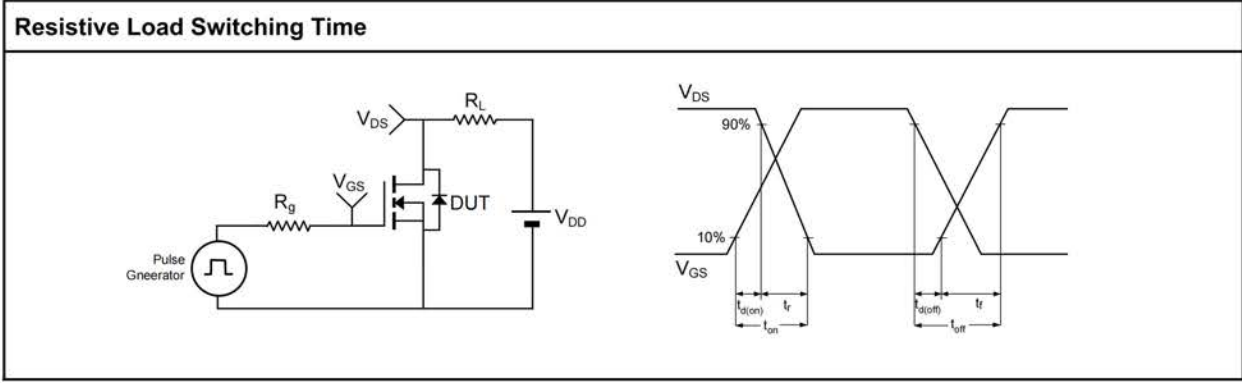
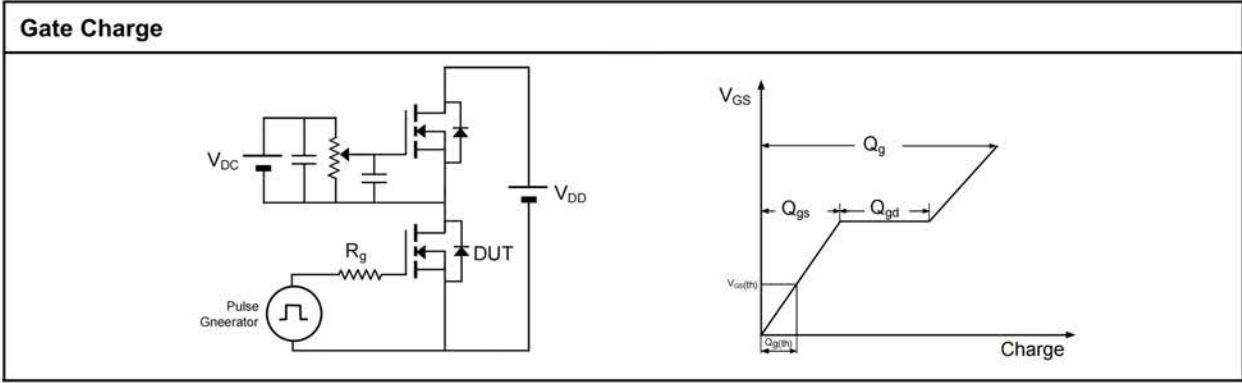
# Typical Characteristics

### ID vs. TC

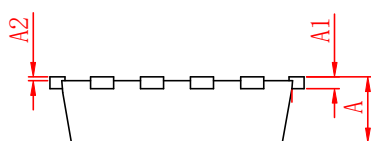
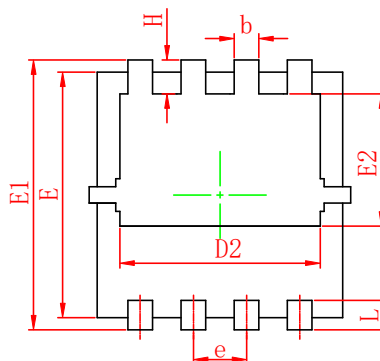
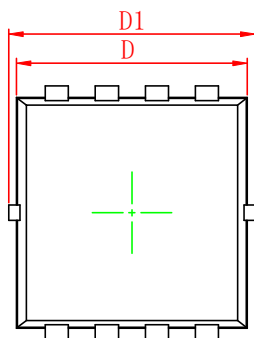


### Normalized Threshold Voltage vs. Junction Temperature





# PDFNWB3.3×3.3-8L PACKAGE OUTLINE DIMENSIONS

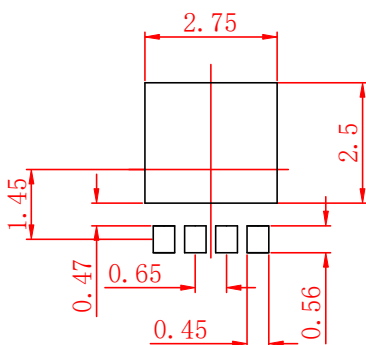


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.65	0.90	0.026	0.035
A1	0.15 REF.		0.006 REF.	
A2	0-0.05		0-0.002	
D	2.90	3.20	0.114	0.126
D1	3.00	3.40	0.118	0.134
D2	2.30	2.60	0.091	0.102
E	2.90	3.20	0.114	0.126
E1	3.00	3.40	0.118	0.134
E2	1.40	1.70	0.055	0.067
b	0.20	0.40	0.008	0.016
e	0.65 BSC.		0.026 BSC.	
L	0.20	0.50	0.008	0.020
H	0.32	0.52	0.012	0.020

**Notes:**

- 1 Dimensions exclusive of mold gate burrs.
- 2 Dimensions exclusive of mold flash and cutting burrs.

## PDFNWB3.3×3.3-8L Suggested Pad Layout



**Notes:**

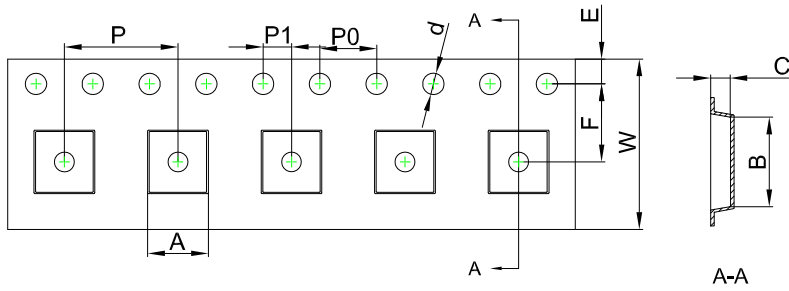
- 1 Controlling dimension: in millimeters.
- 2 General tolerance: ±0.05mm.
- 2 The pad layout is for reference purpose only.

**NOTICE**

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# PDFNWB3.3×3.3-8L Tape and Reel

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

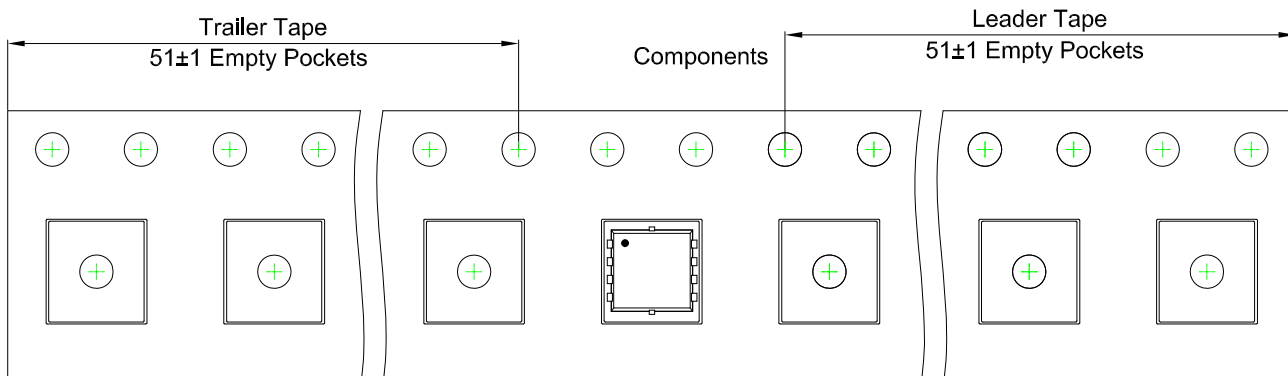


### Packaging Description:

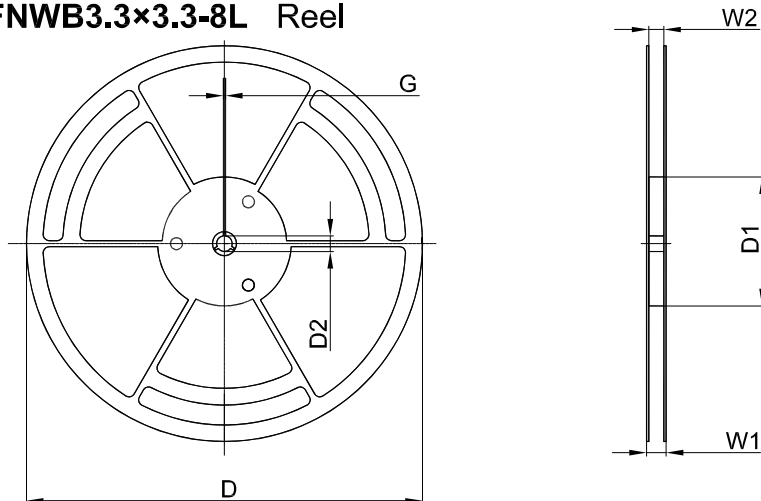
**PDFNWB3.3×3.3-8L** parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 5,000 units per 13" or 33.0 cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).

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" Dia	φ330.00	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	10,000 pcs	360×360×65	50,000 pcs	378×358×382