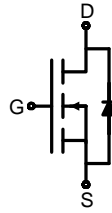
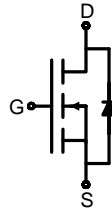




<p><b>30V N-Channel MOSFET</b></p> <p><b>PRODUCT SUMMARY</b></p> <p><math>V_{DS} (V) = 30V</math>  <math>I_D = 24A</math>  <math>R_{DS(ON)(typ)} &lt; 16m\Omega (V_{GS} = 10V)</math>  <math>R_{DS(ON)(typ)} &lt; 21m\Omega (V_{GS} = 4.5V)</math></p> <p>100% UIS Tested          100% <math>R_g</math> Tested</p> <ul style="list-style-type: none"> <li>• Trench Power MOS Technology</li> <li>• Low <math>R_{DS(ON)}</math></li> <li>• Low Gate Charge</li> <li>• High Current Capability</li> <li>• RoHS and Halogen-Free Compliant</li> </ul> <p><b>Applications</b></p> <ul style="list-style-type: none"> <li>• DC/DC Converters in Computing</li> <li>• Isolated DC/DC Converters in Telecom and Industrial</li> </ul>	<p style="text-align: center;"><b>PDFNWB3.3x3.3-8L</b></p> <div style="text-align: right;">  </div> <div style="text-align: center;">  </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p style="font-size: small;">D D D D G S S S</p> </div> <div style="text-align: center;">  <p style="font-size: small;">D D D D S S S G</p> </div> </div> <p style="text-align: center; font-size: small;">TF:tuofeng; AA:device code; Y:year code; X:Week</p>
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**Package Marking and Ordering Information**

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
100N03M	TF100N03M	PDFN3x3-8	Ø330mm	12mm	5000 units

Absolute Maximum Ratings $T_A=25^\circ C$ unless otherwise noted					
Parameter		Symbol	Maximum		Units
Drain-Source Voltage		$V_{DS}$	30		V
Gate-Source Voltage		$V_{GS}$	±20		V
Continuous Drain Current <sup>B</sup>	$T_C=25^\circ C$	$I_D$	24		A
	Pulsed Drain Current <sup>C</sup>		$I_{DM}$	50	
Continuous Drain Current <sup>A</sup>	$T_A=25^\circ C$	$I_{DSM}$	9.5		W
	Avalanche Current <sup>C</sup>		$I_{AS}, I_{AR}$	17	
Repetitive avalanche energy $L=0.1mH$ <sup>C</sup>		$E_{AS}, E_{AR}$	14		mJ
Power Dissipation <sup>B</sup>	$T_C=25^\circ C$	$P_D$	20		W
	$T_A=25^\circ C$	$P_{DSM}$	3.1		
Junction and Storage Temperature Range		$T_J, T_{STG}$	-55 to 150		°C
Thermal Characteristics					
Parameter		Symbol	Typ	Max	Units
Maximum Junction-to-Ambient <sup>A</sup>	$t \leq 10s$	$R_{\theta JA}$	30	40	°C/W
	Steady-State		60	75	
Maximum Junction-to-Case <sup>B</sup>	Steady-State	$R_{\theta JC}$	5	6	°C/W

**Electrical Characteristics (T<sub>j</sub>=25°C unless otherwise noted)**

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>STATIC PARAMETERS</b>						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	I <sub>D</sub> =250μA, V <sub>GS</sub> =0V	30			V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V			1	μA
I <sub>GSS</sub>	Gate-Body leakage current	V <sub>DS</sub> =0V, V <sub>GS</sub> = ±20V			±100	nA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> I <sub>D</sub> =250μA	1.4	1.8	2.5	V
I <sub>D(ON)</sub>	On state drain current	V <sub>GS</sub> =10V, V <sub>DS</sub> =5V	50			A
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =8A		16	20	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =7A		21	26	
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =5V, I <sub>D</sub> =8A		30		S
V <sub>SD</sub>	Diode Forward Voltage	I <sub>S</sub> =1A, V <sub>GS</sub> =0V		0.75	1	V
I <sub>S</sub>	Maximum Body-Diode Continuous Current				20	A
<b>DYNAMIC PARAMETERS</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =15V, f=1MHz	440	550	660	pF
C <sub>oss</sub>	Output Capacitance		77	110	143	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		33	55	77	pF
R <sub>g</sub>	Gate resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1MHz	3	4	4.9	Ω
<b>SWITCHING PARAMETERS</b>						
Q <sub>g</sub> (10V)	Total Gate Charge	V <sub>GS</sub> =10V, V <sub>DS</sub> =15V, I <sub>D</sub> =8A	7.8	9.8	12	nC
Q <sub>g</sub> (4.5V)	Total Gate Charge		3.6	4.6	5.5	nC
Q <sub>gs</sub>	Gate Source Charge		1.4	1.8	2.2	nC
Q <sub>gd</sub>	Gate Drain Charge		1.3	2.2	3	nC
t <sub>D(on)</sub>	Turn-On DelayTime	V <sub>GS</sub> =10V, V <sub>DS</sub> =15V, R <sub>L</sub> =2Ω, R <sub>GEN</sub> =3Ω		5		ns
t <sub>r</sub>	Turn-On Rise Time			3.2		ns
t <sub>D(off)</sub>	Turn-Off DelayTime			24		ns
t <sub>f</sub>	Turn-Off Fall Time			6		ns
t <sub>rr</sub>	Body Diode Reverse Recovery Time	I <sub>F</sub> =8A, di/dt=500A/μs	7	9	11	ns
Q <sub>rr</sub>	Body Diode Reverse Recovery Charge	I <sub>F</sub> =8A, di/dt=500A/μs	12	15	18	nC

A: The value of R<sub>θJA</sub> is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with T<sub>A</sub>=25° C. The Power dissipation P<sub>DSM</sub> is based on R<sub>θJA</sub> t ≤ 10s value and the maximum allowed junction temperature of 150° C. The value in any given application depends on the user's specific board design, and the maximum temperature of 150° C may be used if the PCB allows it.

B: The power dissipation P<sub>D</sub> is based on T<sub>J(MAX)</sub>=150° C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.

C: Repetitive rating, pulse width limited by junction temperature T<sub>J(MAX)</sub>=150° C.

D: The R<sub>θJA</sub> is the sum of the thermal impedance from junction to case R<sub>θJC</sub> and case to ambient.

E: The static characteristics in Figures 1 to 6 are obtained using <300ms pulses, duty cycle 0.5% max.

F: These curves are based on the junction-to-case thermal impedance which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of T<sub>J(MAX)</sub>=150° C.

G: The maximum current rating is limited by bond-wires.

H: These tests are performed with the device mounted on 1 in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with T<sub>A</sub>=25° C. The SOA curve provides a single pulse rating.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

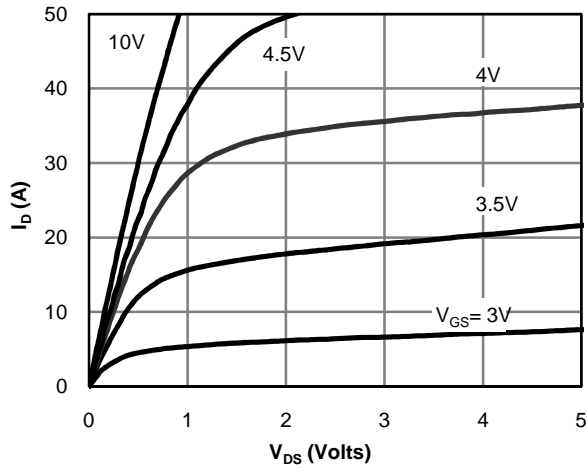


Figure 1: On-Region Characteristics

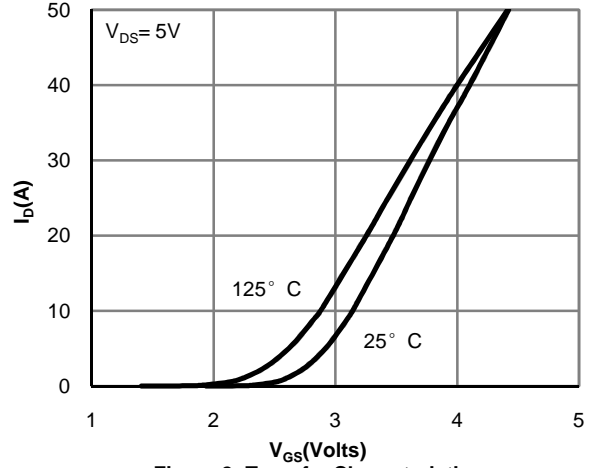


Figure 2: Transfer Characteristics

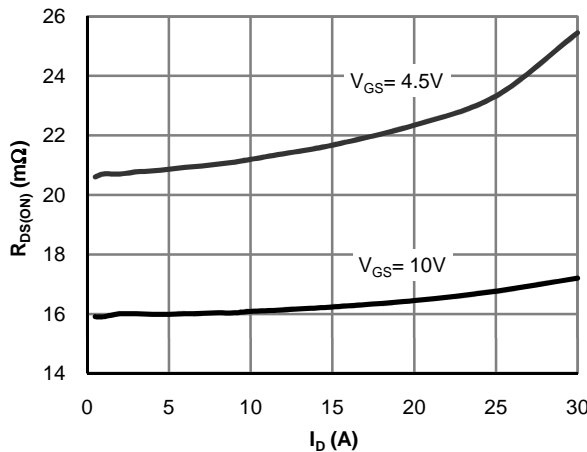


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

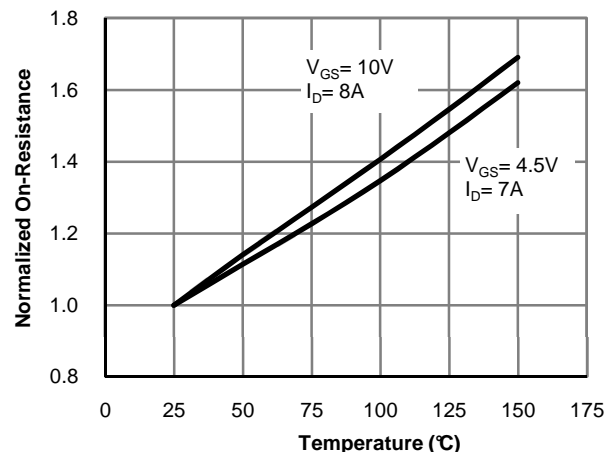


Figure 4: On-Resistance vs. Junction Temperature

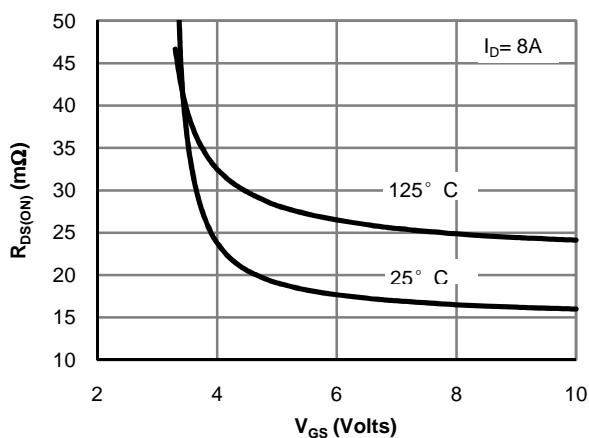


Figure 5: On-Resistance vs. Gate-Source Voltage

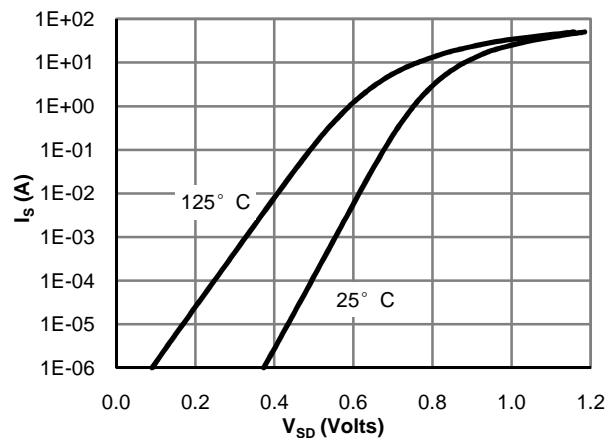


Figure 6: Body-Diode Characteristics

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

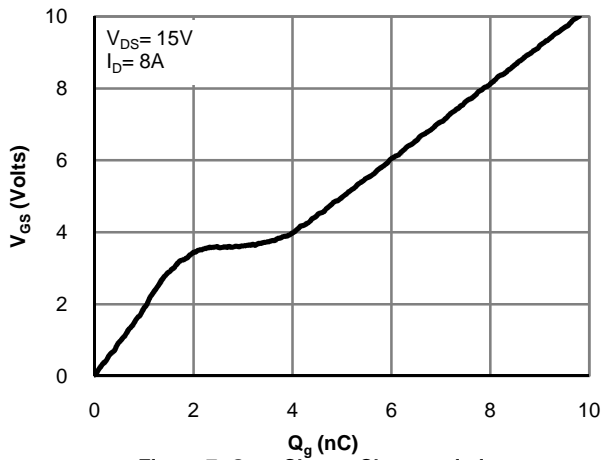


Figure 7: Gate-Charge Characteristics

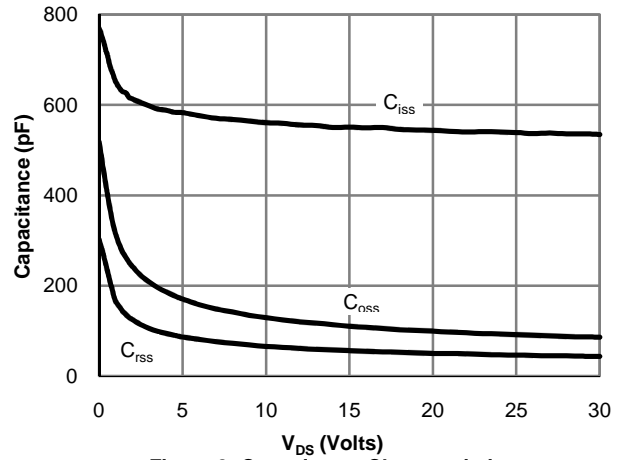


Figure 8: Capacitance Characteristics

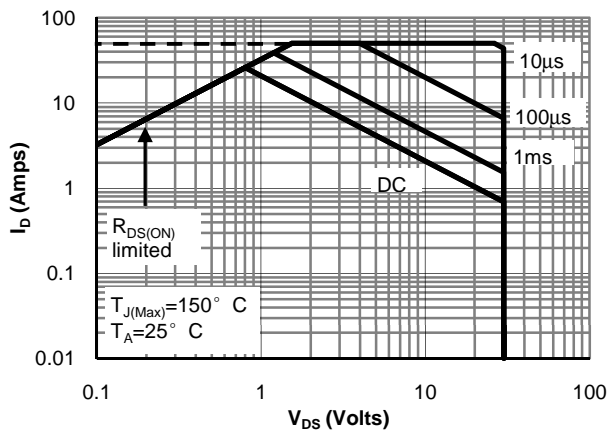


Figure 9: Maximum Forward Biased Safe Operating Area (Note H)

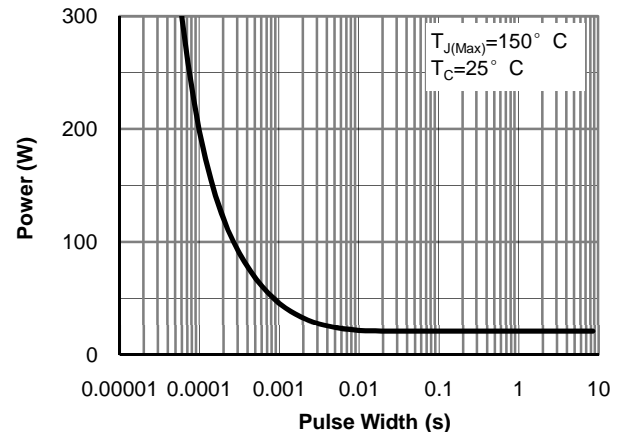


Figure 10: Single Pulse Power Rating Junction-to-Case (Note F)

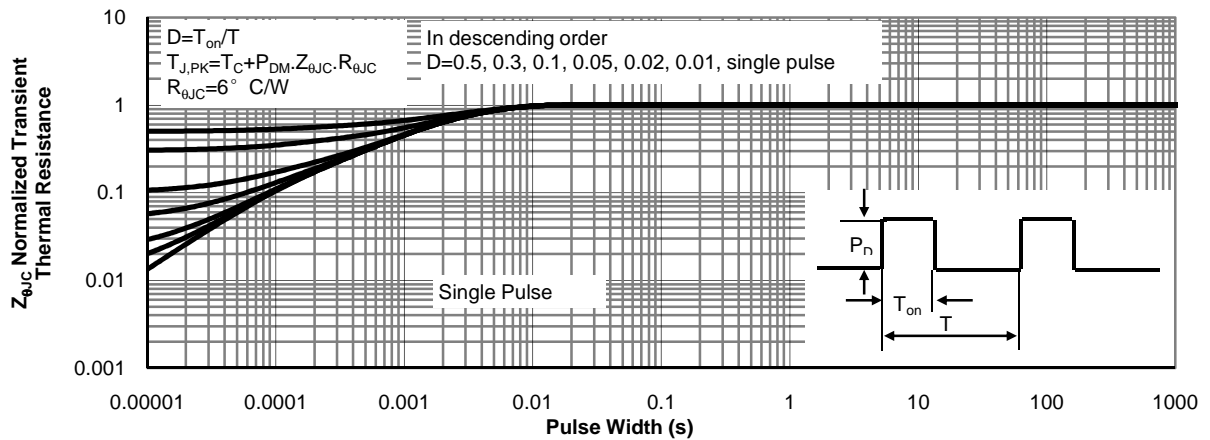


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

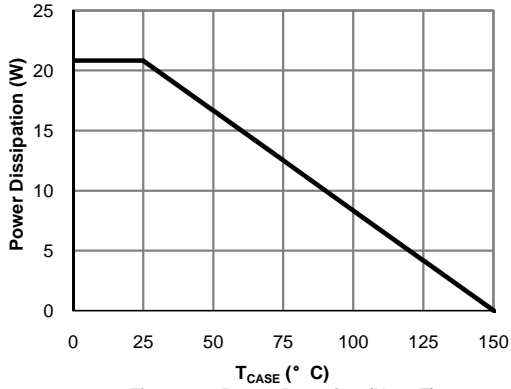


Figure 12: Power De-rating (Note F)

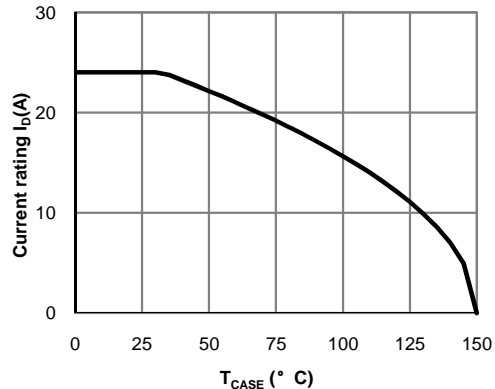


Figure 13: Current De-rating (Note F)

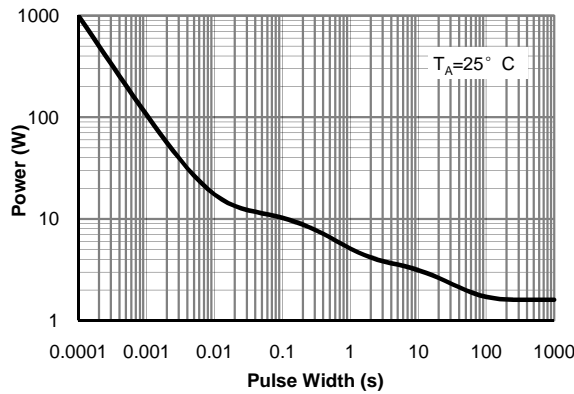


Figure 14: Single Pulse Power Rating Junction-to-Ambient (Note H)

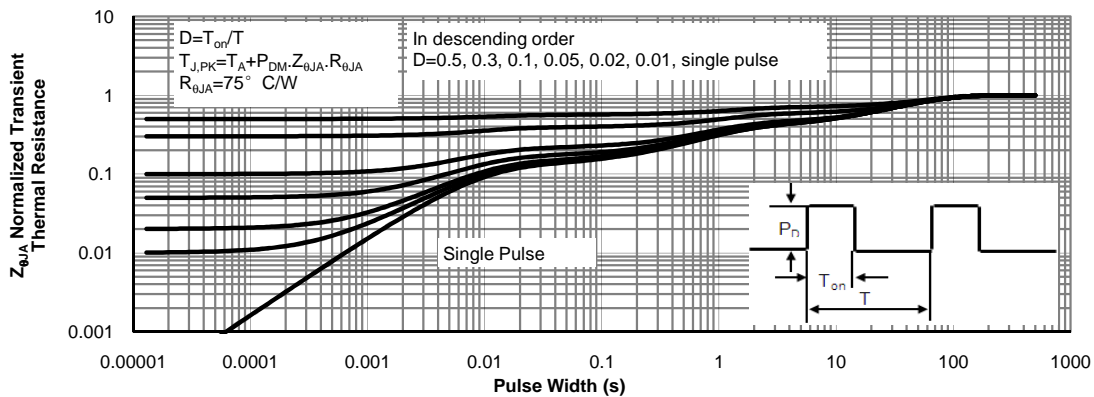
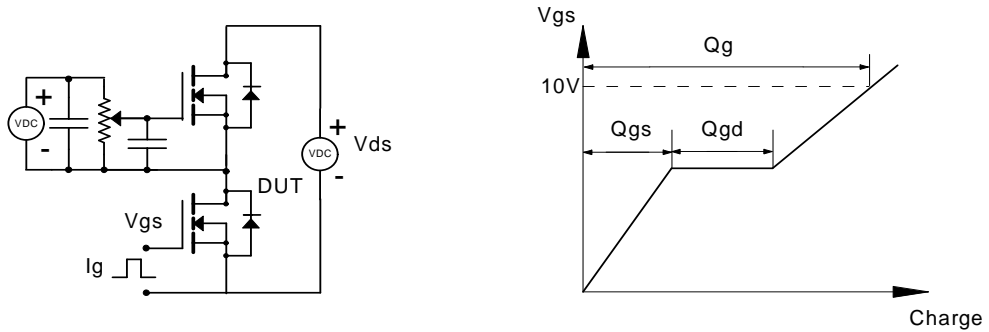
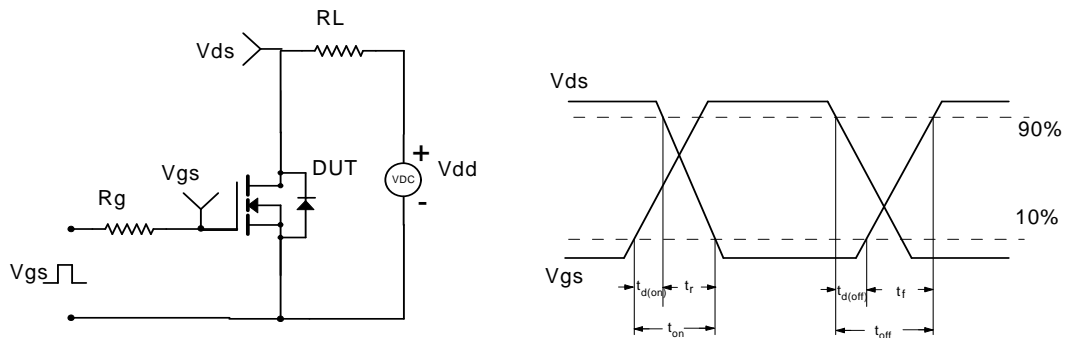


Figure 15: Normalized Maximum Transient Thermal Impedance(Note H)

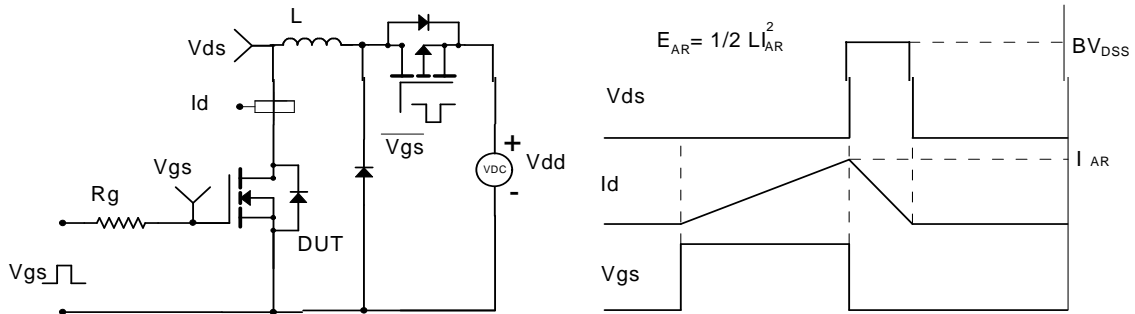
Gate Charge Test Circuit & Waveform



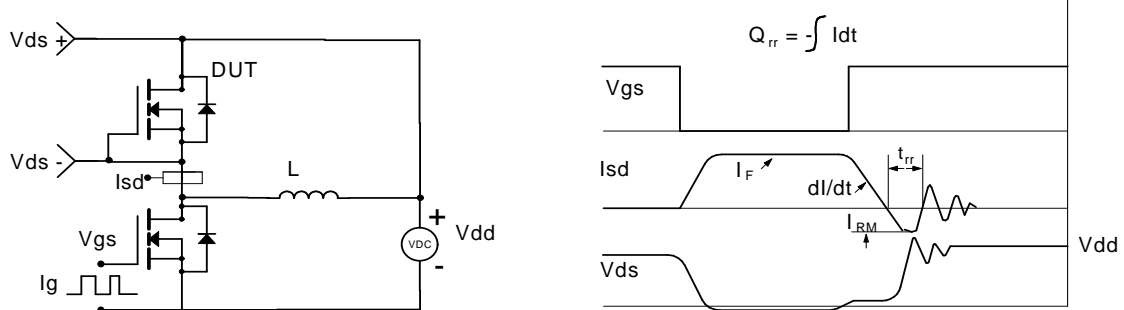
Resistive Switching Test Circuit & Waveforms



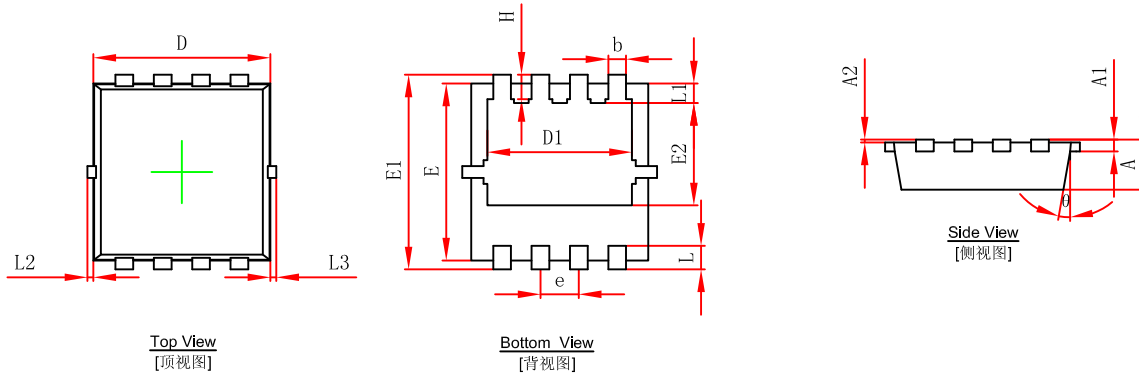
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

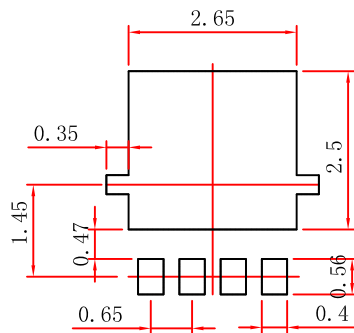


PDFNWB3.3x3.3-8L Package Outline Dimensions



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°

PDFNWB3.3x3.3-8L Suggested Pad Layout



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