
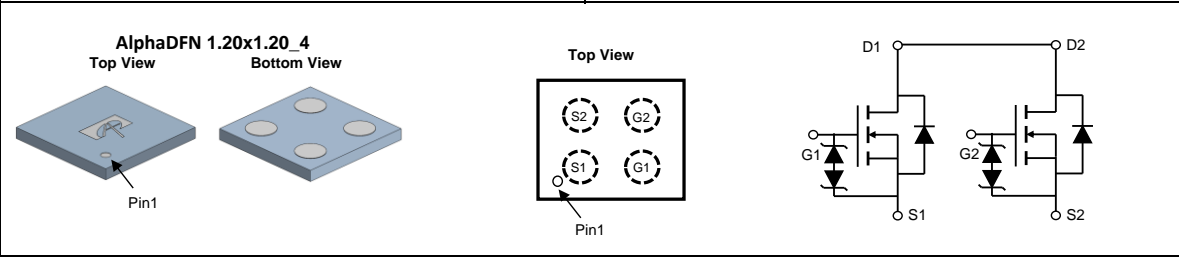


<p><b>General Description</b></p> <ul style="list-style-type: none"> <li>• Trench Power MOSFET technology</li> <li>• Ultra low <math>R_{SS(ON)}</math></li> <li>• Common drain configuration for design simplicity</li> <li>• RoHS and Halogen-Free Compliant</li> </ul> <p><b>Applications</b></p> <ul style="list-style-type: none"> <li>• Battery protection switch</li> <li>• Mobile device battery charging and discharging</li> </ul>	<p><b>Product Summary</b></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 60%;"><math>V_{SS}</math></td> <td style="text-align: right;">20V</td> </tr> <tr> <td><math>R_{SS(ON)}</math> (at <math>V_{GS}=4.5V</math>)</td> <td style="text-align: right;">&lt; 36m<math>\Omega</math></td> </tr> <tr> <td><math>R_{SS(ON)}</math> (at <math>V_{GS}=3.8V</math>)</td> <td style="text-align: right;">&lt; 39m<math>\Omega</math></td> </tr> <tr> <td><math>R_{SS(ON)}</math> (at <math>V_{GS}=3.1V</math>)</td> <td style="text-align: right;">&lt; 44m<math>\Omega</math></td> </tr> <tr> <td><math>R_{SS(ON)}</math> (at <math>V_{GS}=2.5V</math>)</td> <td style="text-align: right;">&lt; 55m<math>\Omega</math></td> </tr> </table> <p><b>Typical ESD protection</b> <span style="float: right;"><b>HBM Class 2</b></span></p> <div style="text-align: right;">  </div>	$V_{SS}$	20V	$R_{SS(ON)}$ (at $V_{GS}=4.5V$ )	< 36m $\Omega$	$R_{SS(ON)}$ (at $V_{GS}=3.8V$ )	< 39m $\Omega$	$R_{SS(ON)}$ (at $V_{GS}=3.1V$ )	< 44m $\Omega$	$R_{SS(ON)}$ (at $V_{GS}=2.5V$ )	< 55m $\Omega$
$V_{SS}$	20V										
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$R_{SS(ON)}$ (at $V_{GS}=2.5V$ )	< 55m $\Omega$										



Orderable Part Number	Package Type	Form	Minimum Order Quantity
AOCA32116E	AlphaDFN 1.20x1.20_4	Tape & Reel	8000

**Absolute Maximum Ratings**  $T_A=25^\circ C$  unless otherwise noted

Parameter	Symbol	Rating	Units
Source-Source Voltage	$V_{SS}$	20	V
Gate-Source Voltage	$V_{GS}$	$\pm 12$	V
Source Current(DC) <sup>Note1</sup>	$I_S$	6	A
Source Current(Pulse) <sup>Note2</sup>		25	
Power Dissipation <sup>Note1</sup>	$P_D$	1.7	W
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to 150	$^\circ C$

**Thermal Characteristics**

Parameter	Symbol	Typical	Units
Maximum Junction-to-Ambient	$R_{\theta JA}$	65	$^\circ C/W$
Maximum Junction-to-Ambient		75	$^\circ C/W$

**Note 1.**  $I_S$  rated value is based on bare silicon.Mounted on 70mmx70mm FR-4 board.  
**Note 2.** PW <10  $\mu s$  pulses, duty cycle 1% max.

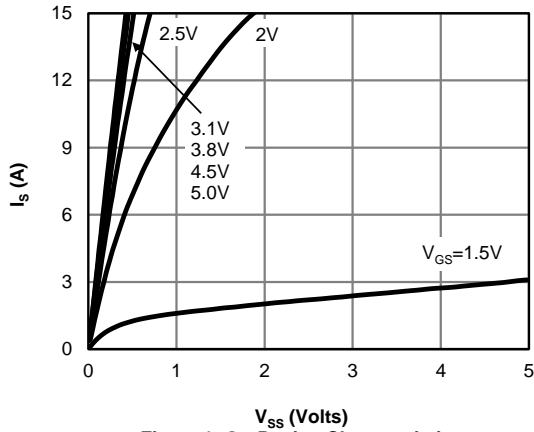
**Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)**

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>STATIC PARAMETERS</b>						
BV <sub>SSS</sub>	Source-Source Breakdown Voltage	I <sub>S</sub> =250μA, V <sub>GS</sub> =0V Test Circuit 6	20			V
I <sub>SSS</sub>	Zero Gate Voltage Source Current	V <sub>SS</sub> =20V, V <sub>GS</sub> =0V Test Circuit 1			1	μA
		T <sub>J</sub> =55°C			5	
I <sub>GSS</sub>	Gate leakage current	V <sub>SS</sub> =0V, V <sub>GS</sub> =±12V Test Circuit 2			±10	μA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>SS</sub> =V <sub>GS</sub> , I <sub>S</sub> =250μA Test Circuit 3	0.5	0.85	1.3	V
R <sub>SS(ON)</sub>	Static Source to Source On-Resistance	V <sub>GS</sub> =4.5V, I <sub>S</sub> =3A Test Circuit 4	20	29.5	36	mΩ
		T <sub>J</sub> =125°C	28	40.5	50	
		V <sub>GS</sub> =3.8V, I <sub>S</sub> =3A Test Circuit 4	21	31	39	mΩ
		V <sub>GS</sub> =3.1V, I <sub>S</sub> =3A Test Circuit 4	23	33.6	44	mΩ
		V <sub>GS</sub> =2.5V, I <sub>S</sub> =3A Test Circuit 4	26	38.6	55	mΩ
g <sub>FS</sub>	Forward Transconductance	V <sub>SS</sub> =5V, I <sub>S</sub> =3A Test Circuit 3		20		S
V <sub>FSS</sub>	Forward Source to Source Voltage	I <sub>S</sub> =1A, V <sub>GS</sub> =0V Test Circuit 5		0.68	1	V
<b>DYNAMIC PARAMETERS</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>SS</sub> =10V, f=1MHz	410	520	630	pF
C <sub>oss</sub>	Output Capacitance		50	72	95	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		14	48	82	pF
R <sub>g</sub>	Gate resistance	f=1MHz		2		KΩ
<b>SWITCHING PARAMETERS</b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>G1S1</sub> =4.5V, V <sub>SS</sub> =10V, I <sub>S</sub> =3A		5.5		nC
t <sub>D(on)</sub>	Turn-On DelayTime	V <sub>G1S1</sub> =4.5V, V <sub>SS</sub> =10V, R <sub>L</sub> =3.3Ω, R <sub>GEN</sub> =3Ω Test Circuit8		0.5		μs
t <sub>r</sub>	Turn-On Rise Time		1.4	μs		
t <sub>D(off)</sub>	Turn-Off DelayTime		1.9	μs		
t <sub>f</sub>	Turn-Off Fall Time		2.7	μs		

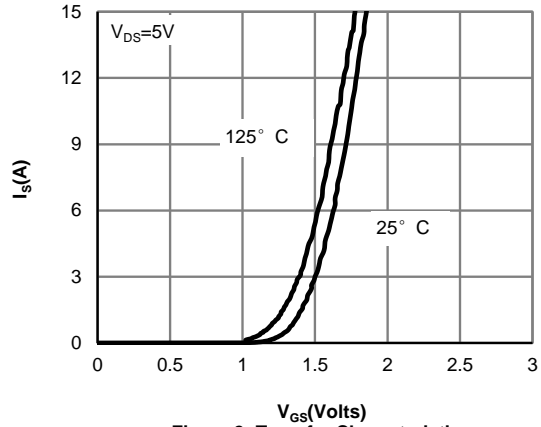
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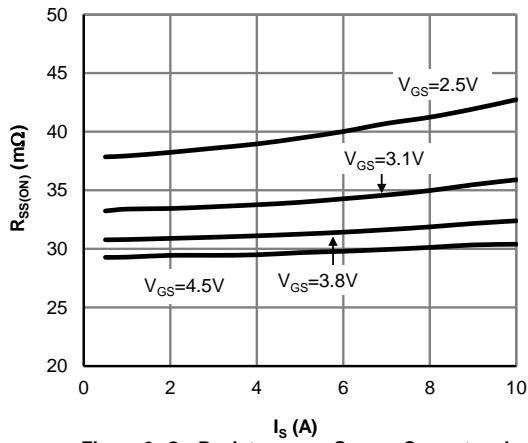
**TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**



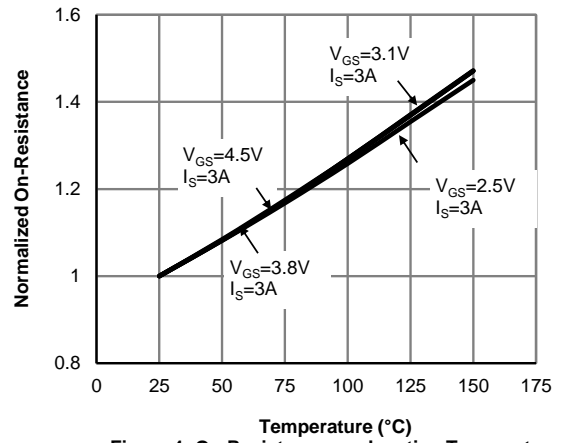
**Figure 1: On-Region Characteristics**



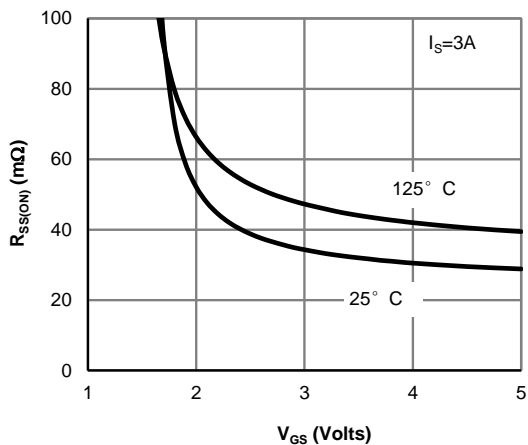
**Figure 2: Transfer Characteristics**



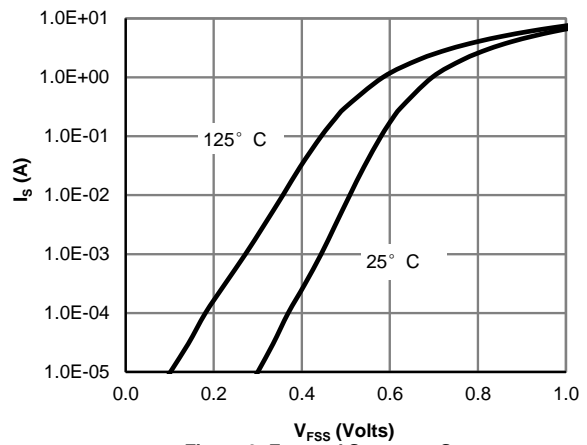
**Figure 3: On-Resistance vs. Source Current and Gate Voltage**



**Figure 4: On-Resistance vs. Junction Temperature**

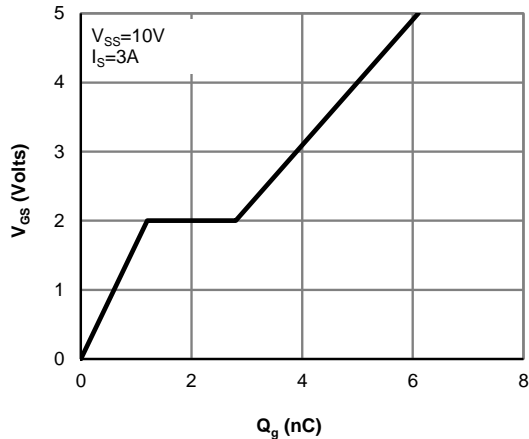


**Figure 5: On-Resistance vs. Gate-Source Voltage**

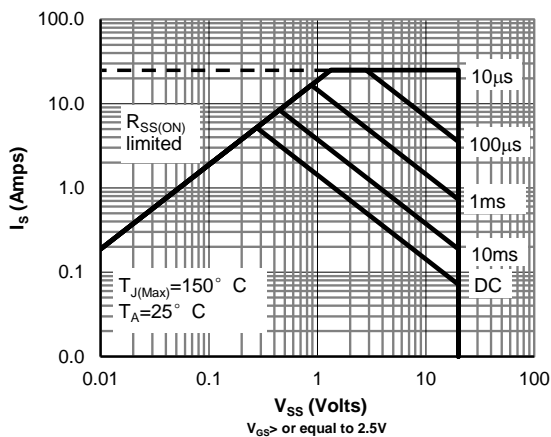


**Figure 6: Forward Source to Source Characteristics**

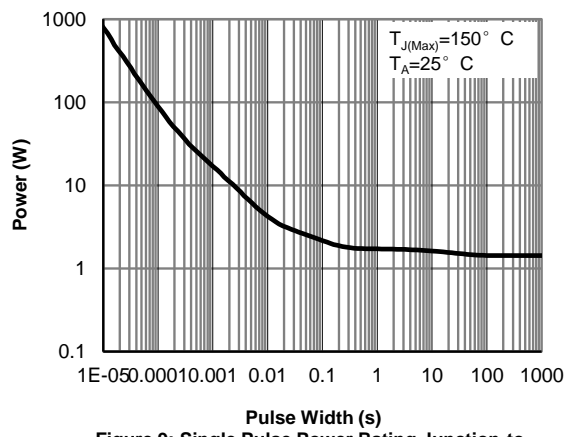
**TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**



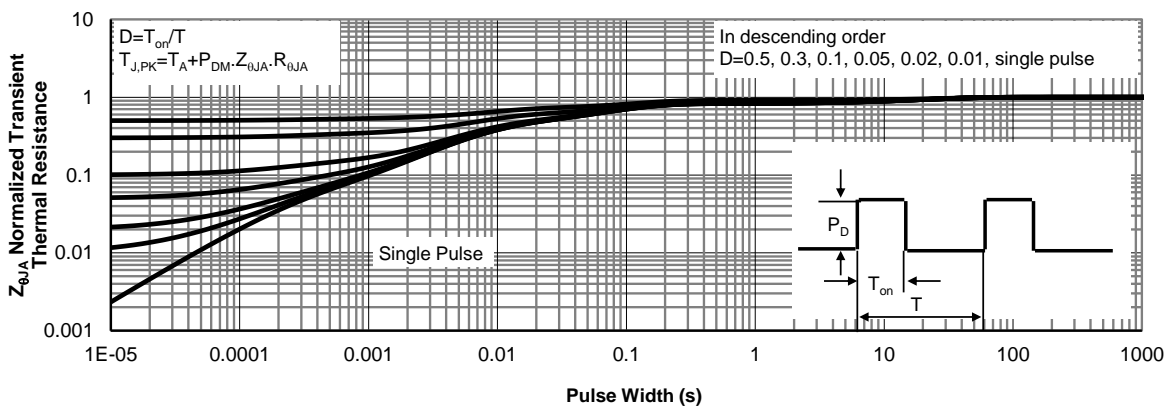
**Figure 7: Gate-Charge Characteristics**



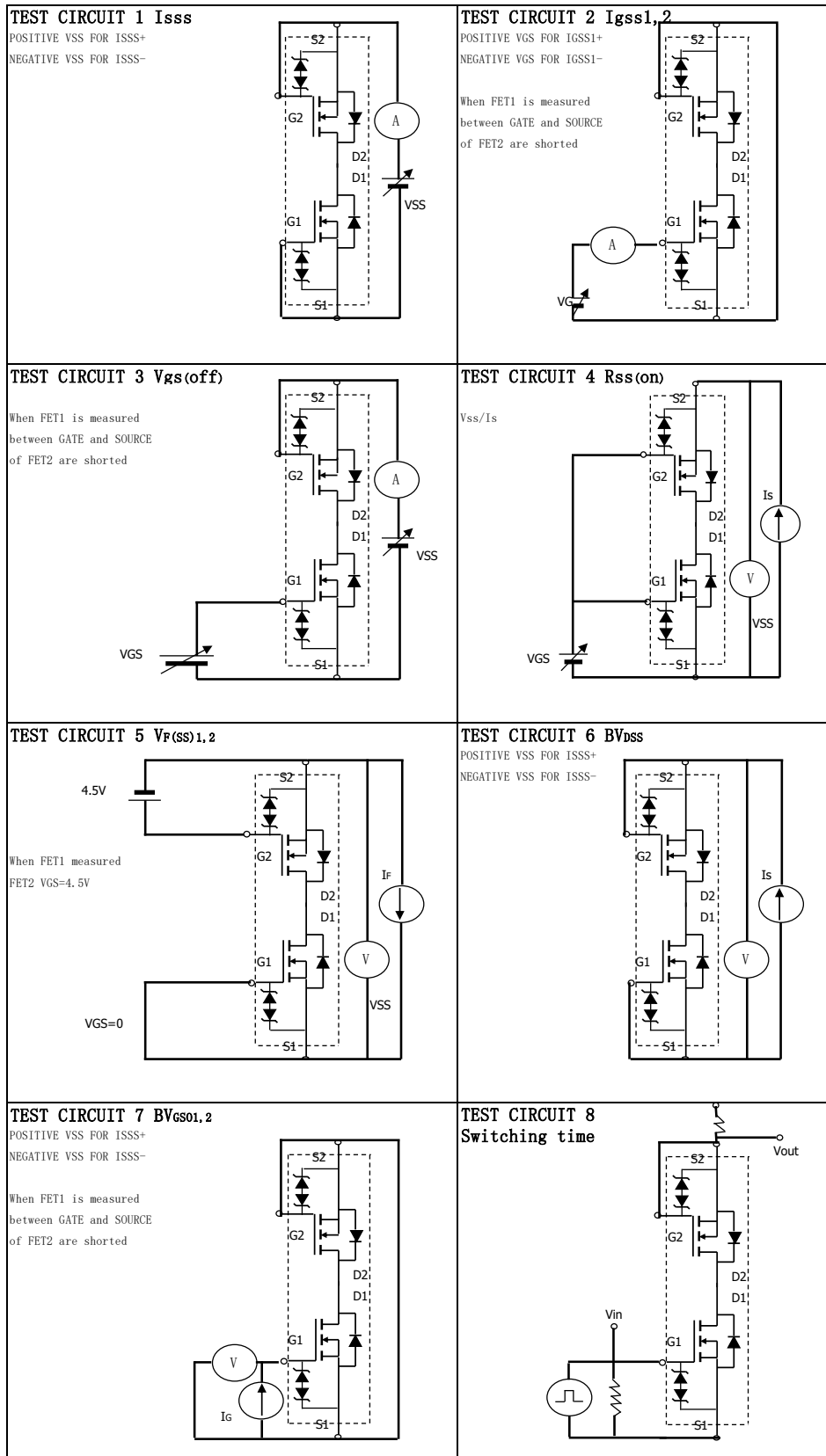
**Figure 8: Maximum Forward Biased Safe Operating Area (Note1)**



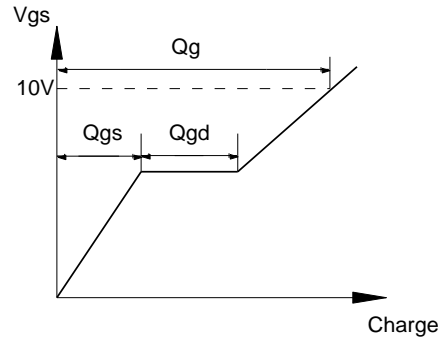
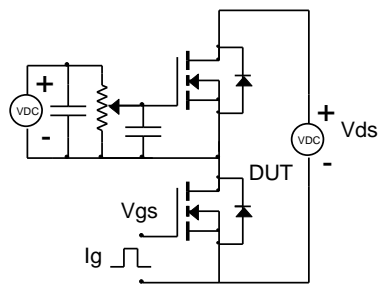
**Figure 9: Single Pulse Power Rating Junction-to-Ambient (Note1)**



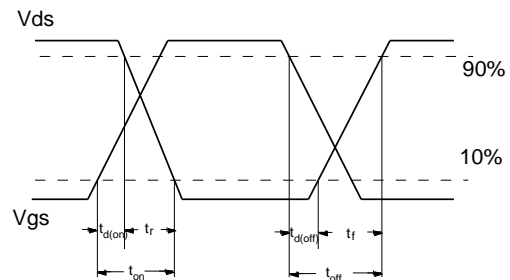
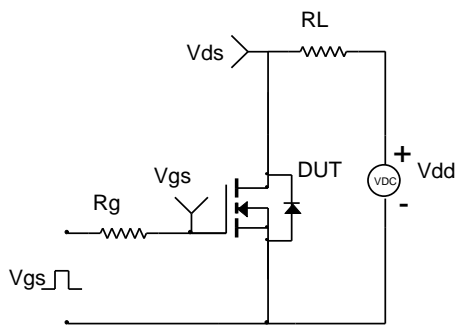
**Figure 10: Normalized Maximum Transient Thermal Impedance (Note1)**



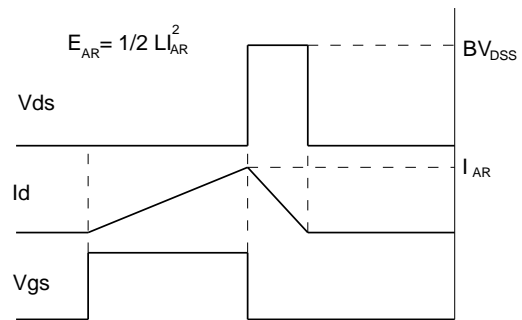
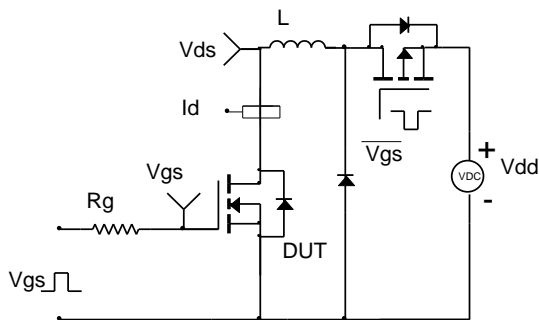
**Gate Charge Test Circuit & Waveform**



**Resistive Switching Test Circuit & Waveforms**



**Unclamped Inductive Switching (UIS) Test Circuit & Waveforms**



**Diode Recovery Test Circuit & Waveforms**

