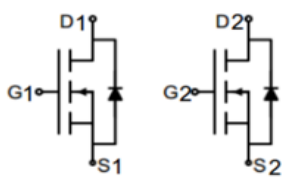
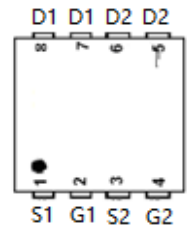



# N-Channel Trench MOSFET

<p><b>Description</b></p> <p>The G33N03D3 uses advanced trench technology to provide excellent <math>R_{DS(ON)}</math>, low gate charge. It can be used in a wide variety of applications.</p> <p><b>General Features</b></p> <ul style="list-style-type: none"> <li>● <math>V_{DS}</math> 30V</li> <li>● <math>I_D</math> (at <math>V_{GS} = 10V</math>) 33A</li> <li>● <math>R_{DS(ON)}</math> (at <math>V_{GS} = 10V</math>) &lt; 12m<math>\Omega</math></li> <li>● <math>R_{DS(ON)}</math> (at <math>V_{GS} = 4.5V</math>) &lt; 13m<math>\Omega</math></li> <li>● 100% Avalanche Tested</li> <li>● RoHS Compliant</li> </ul> <p><b>Application</b></p> <ul style="list-style-type: none"> <li>● Power switch</li> <li>● DC/DC converters</li> </ul>		 <p>Schematic Diagram</p>  <p>Marking and pin assignment</p>  <p>DFN3.3*3.3-8L</p>	
<b>Device</b>	<b>Package</b>	<b>Marking</b>	<b>Packaging</b>
G33N03D3	DFN3.3*3.3-8L	G33N03	5000pcs/Reel

**Absolute Maximum Ratings**  $T_C = 25^{\circ}C$ , unless otherwise noted

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	30	V
Continuous Drain Current	$I_D$	33	A
Pulsed Drain Current (note1)	$I_{DM}$	132	A
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Power Dissipation	$P_D$	20	W
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 To 150	$^{\circ}C$

**Thermal Resistance**

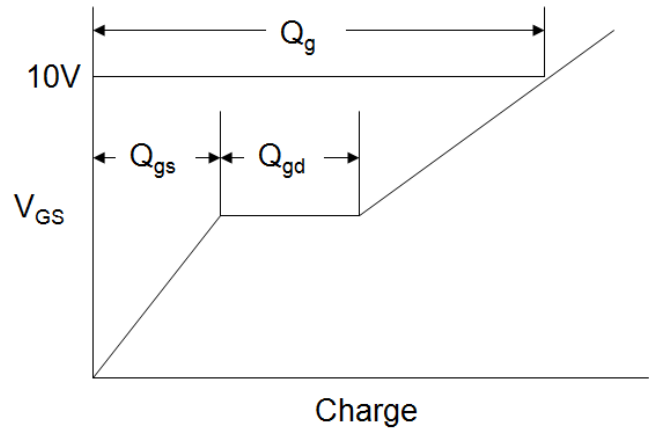
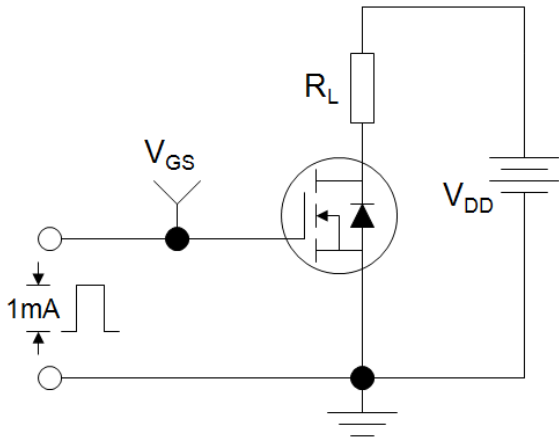
Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Ambient	$R_{thJA}$	78	$^{\circ}C/W$
Thermal Resistance, Junction-to-Case	$R_{thJC}$	6.25	$^{\circ}C/W$

Specifications $T_J = 25^\circ\text{C}$ , unless otherwise noted						
Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
<b>Static Parameters</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu\text{A}$	30	--	--	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 30V, V_{GS} = 0V, T_J = 25^\circ\text{C}$	--	--	1	$\mu\text{A}$
Gate-Source Leakage	$I_{GSS}$	$V_{GS} = \pm 20V$	--	--	$\pm 100$	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	0.5	0.66	1.1	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 18A$	--	10	12	m $\Omega$
		$V_{GS} = 4.5V, I_D = 18A$	--	11	13	
Forward Transconductance	$g_{FS}$	$V_{DS}=5V, I_D=18A$	26	--	--	S
<b>Dynamic Parameters</b>						
Input Capacitance	$C_{iss}$	$V_{GS} = 0V,$ $V_{DS} = 15V,$ $f = 1.0\text{MHz}$	--	938	--	pF
Output Capacitance	$C_{oss}$		--	142	--	
Reverse Transfer Capacitance	$C_{rss}$		--	99	--	
Total Gate Charge	$Q_g$	$V_{DD} = 15V,$ $I_D = 18A,$ $V_{GS} = 10V$	--	17.5	--	nC
Gate-Source Charge	$Q_{gs}$		--	3	--	
Gate-Drain Charge	$Q_{gd}$		--	7.1	--	
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = 15V,$ $I_D = 18A,$ $R_G = 3\Omega$	--	5	--	ns
Turn-on Rise Time	$t_r$		--	12	--	
Turn-off Delay Time	$t_{d(off)}$		--	19	--	
Turn-off Fall Time	$t_f$		--	6	--	
<b>Drain-Source Body Diode Characteristics</b>						
Continuous Body Diode Current	$I_S$	$T_C = 25^\circ\text{C}$	--	--	33	A
Pulsed Diode Forward Current	$I_{SM}$		--	--	132	
Body Diode Voltage	$V_{SD}$	$T_J = 25^\circ\text{C}, I_{SD} = 18A, V_{GS} = 0V$	--	--	1.2	V

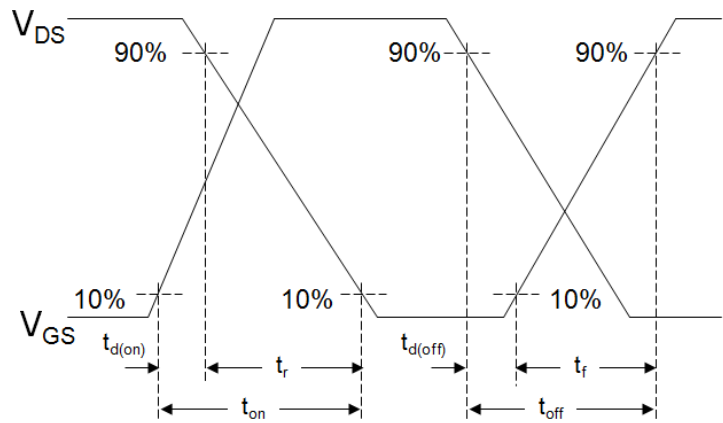
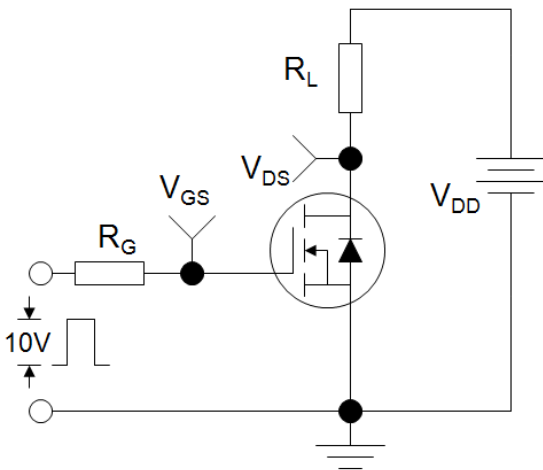
**Notes**

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. Identical low side and high side switch with identical  $R_G$

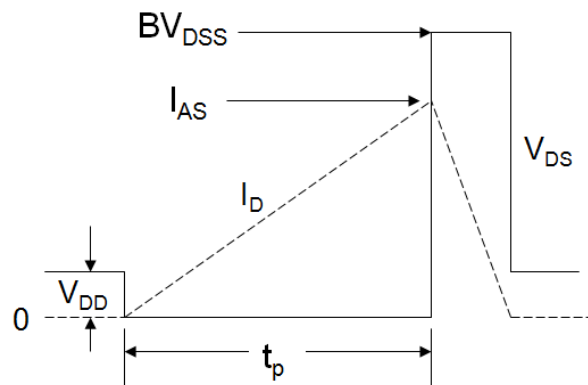
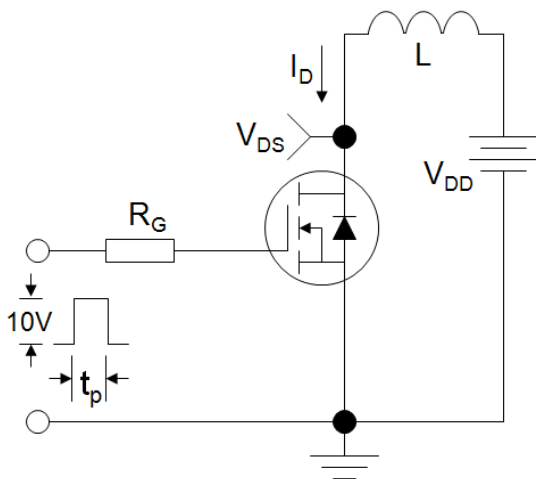
Gate Charge Test Circuit



EAS Test Circuit



Switch Time Test Circuit



Typical Characteristics  $T_J = 25^\circ\text{C}$ , unless otherwise noted

Figure 1. Output Characteristics

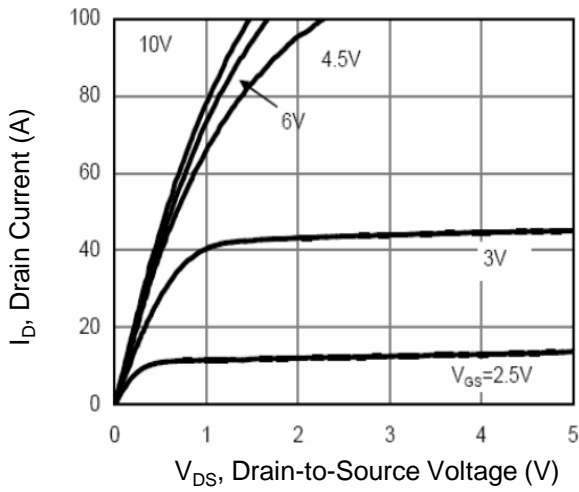


Figure 2. Transfer Characteristics

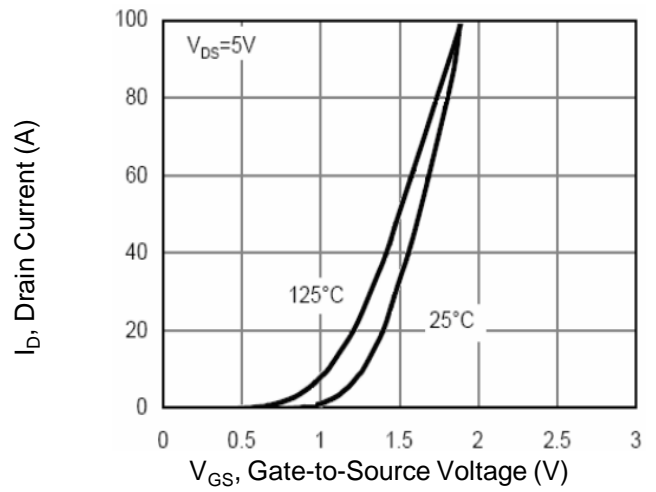


Figure 3.  $R_{DS(on)}$ -Drain Current

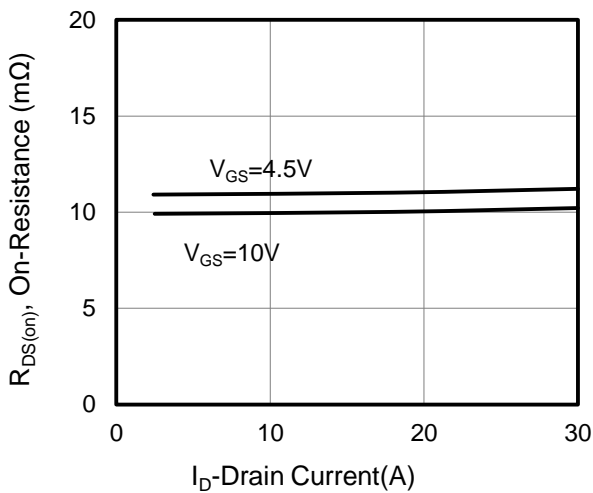


Figure 4. Gate Charge

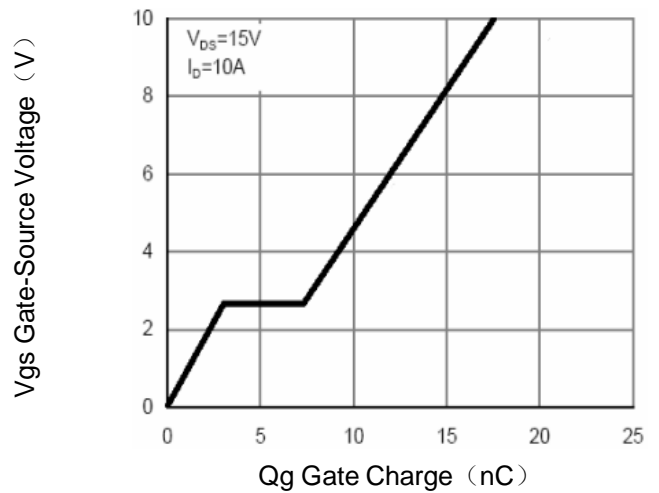


Figure 5. Capacitance vs Vds

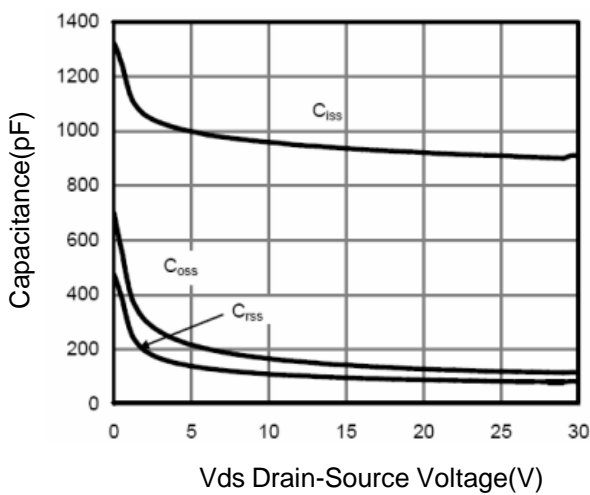
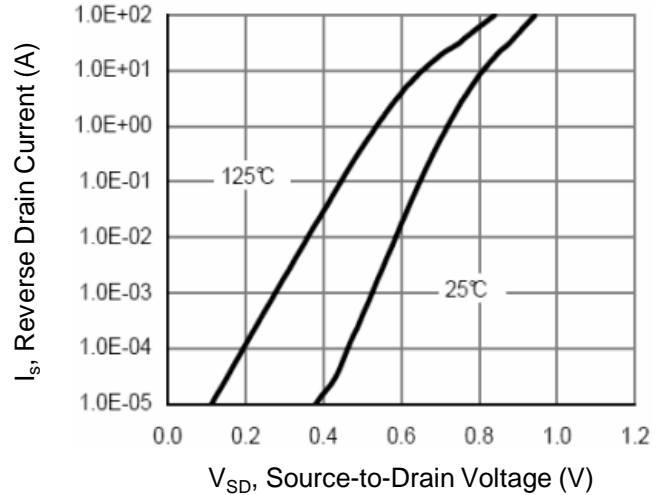


Figure 6. Source-Drain Diode Forward



Typical Characteristics  $T_J = 25^\circ\text{C}$ , unless otherwise noted

Figure 7. Power De-rating

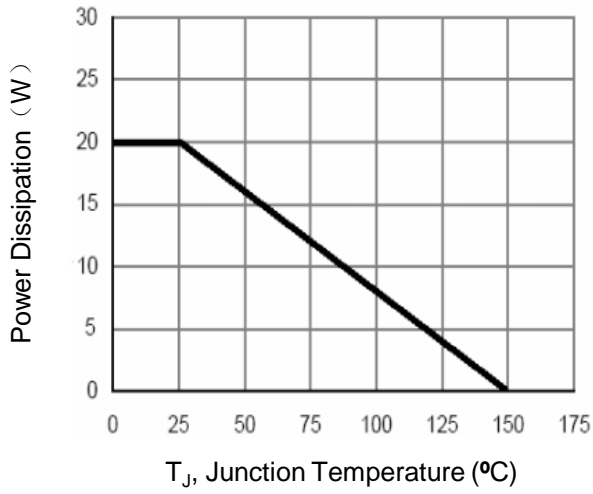


Figure 8. Safe Operation Area

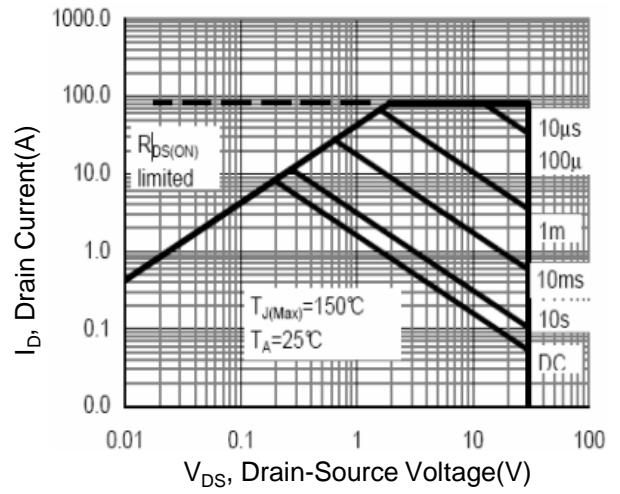
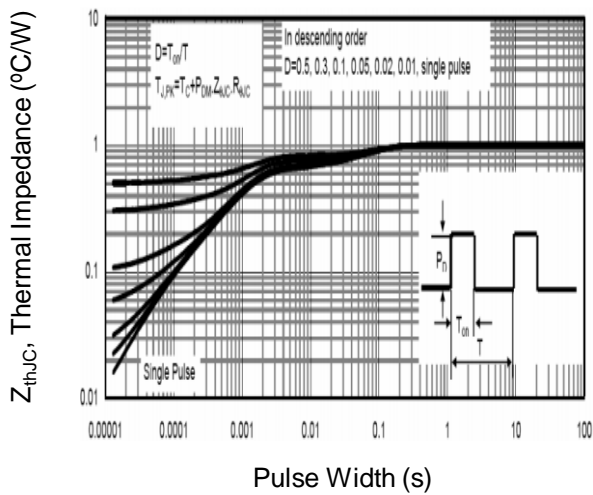
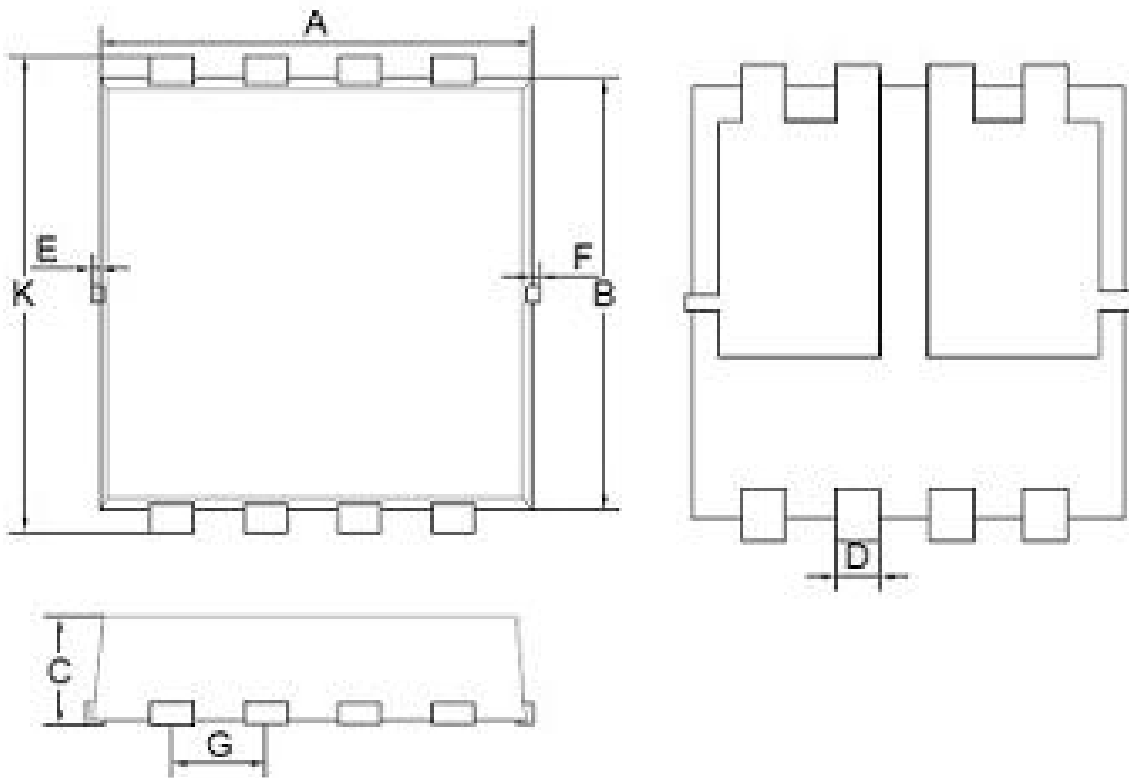


Figure 9. Normalized Maximum Transient Thermal Impedance



DFN3.3\*3.3 Package Information



DFN3.3X3.3-8L.		
Dim	Min	Max
A	2.90	3.10
B	2.90	3.10
C	0.65	0.85
D	0.20	0.40
E	0.00	0.10
F	0.00	0.10
G	0.55	0.75
K	3.15	3.45
All Dimensions in mm		

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