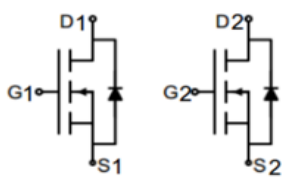
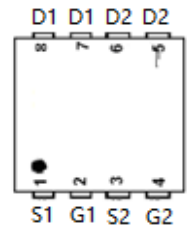



N-Channel Trench MOSFET

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

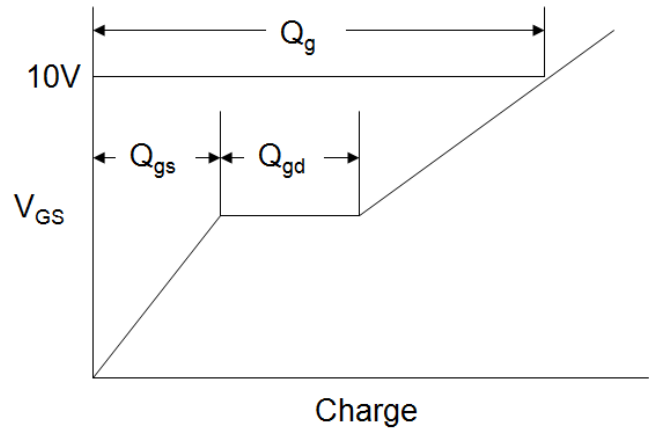
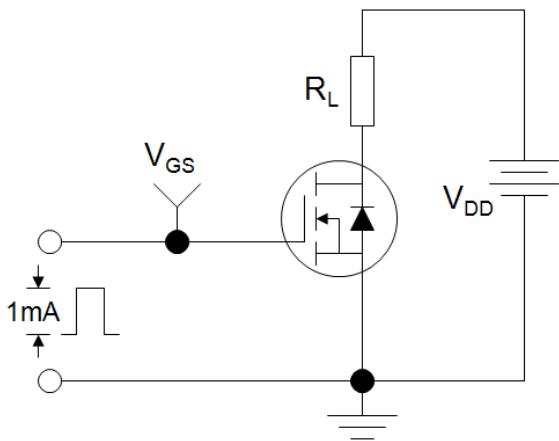
Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Ambient	R_{thJA}	78	$^\circ C/W$
Thermal Resistance, Junction-to-Case	R_{thJC}	6.25	$^\circ C/W$

Specifications $T_J = 25^\circ\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static Parameters						
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	μA
Gate-Source Leakage	I_{GSS}	$V_{GS} = \pm 20V$	--	--	± 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 Ω
		$V_{GS} = 4.5V, I_D = 18A$	--	11	13	
Forward Transconductance	g_{FS}	$V_{DS}=5V, I_D=18A$	26	--	--	S
Dynamic Parameters						
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	--	
Drain-Source Body Diode Characteristics						
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

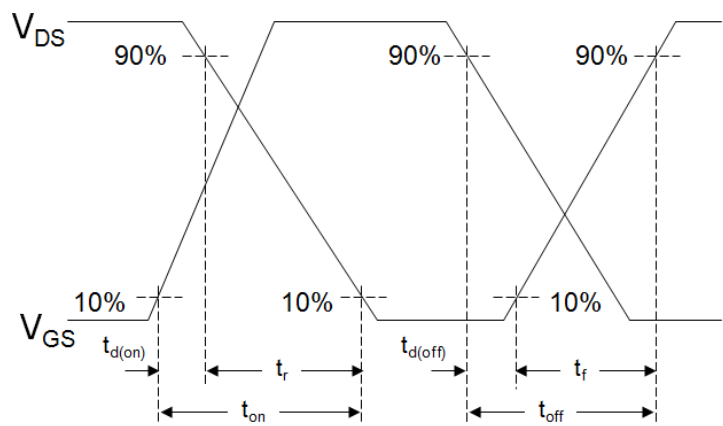
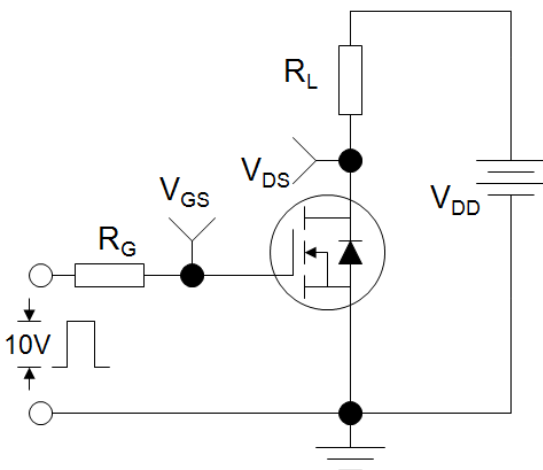
Notes

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

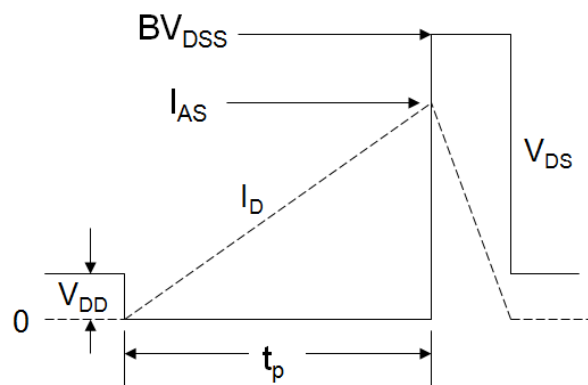
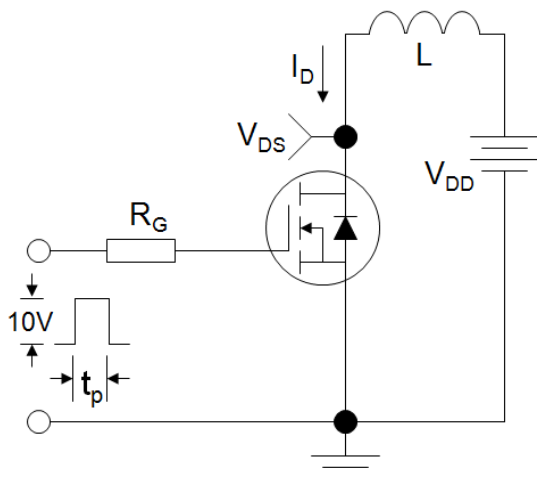
Gate Charge Test Circuit



EAS Test Circuit



Switch Time Test Circuit



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

Figure 1. Output Characteristics

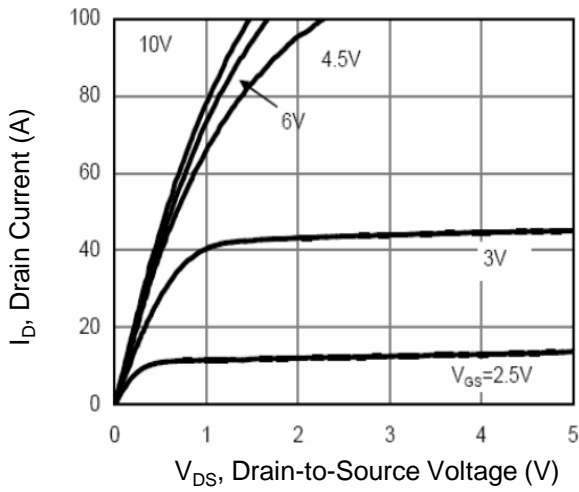


Figure 2. Transfer Characteristics

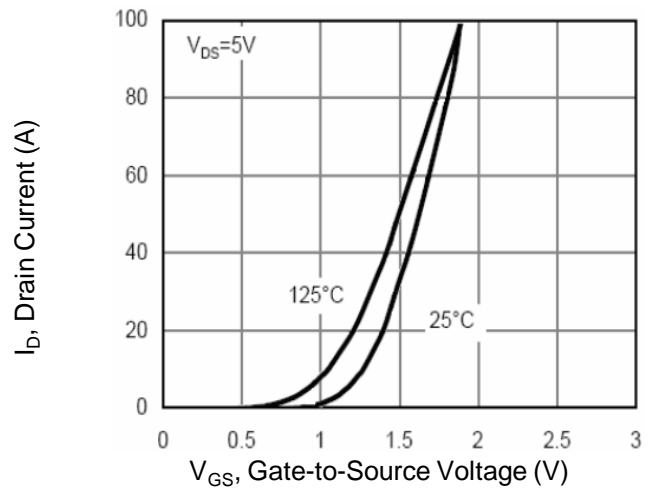


Figure 3. $R_{DS(on)}$ -Drain Current

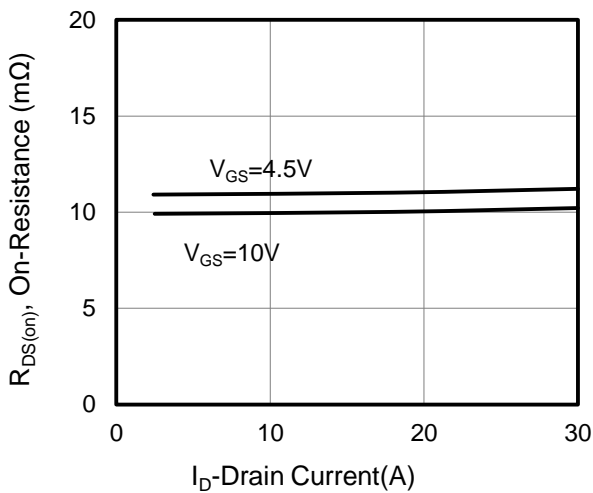


Figure 4. Gate Charge

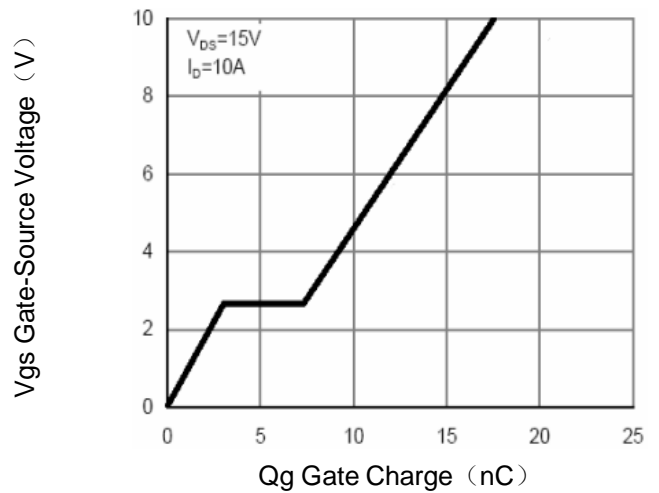


Figure 5. Capacitance vs Vds

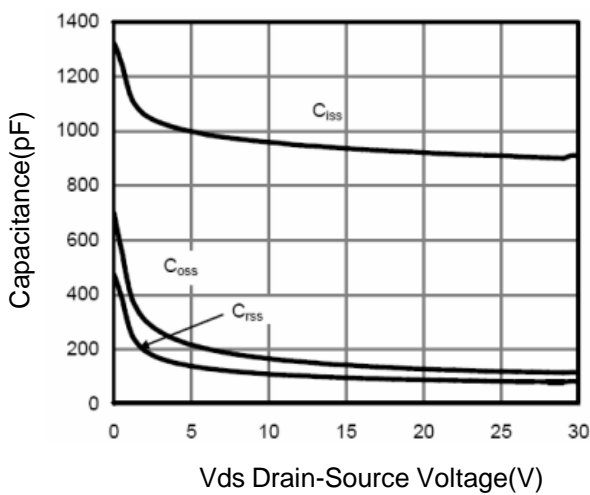
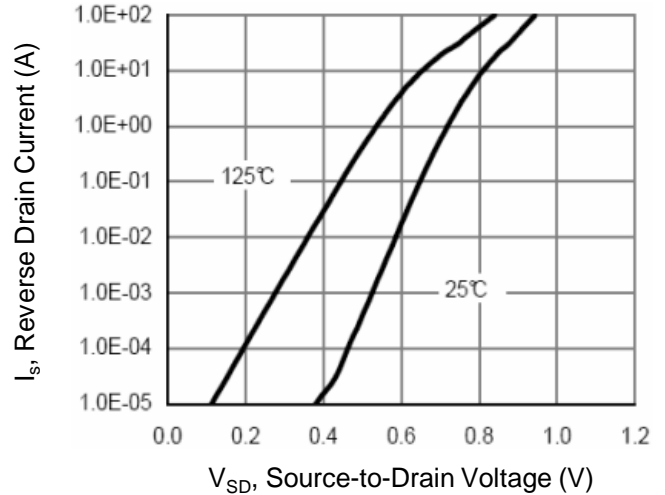


Figure 6. Source-Drain Diode Forward



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

Figure 7. Power De-rating

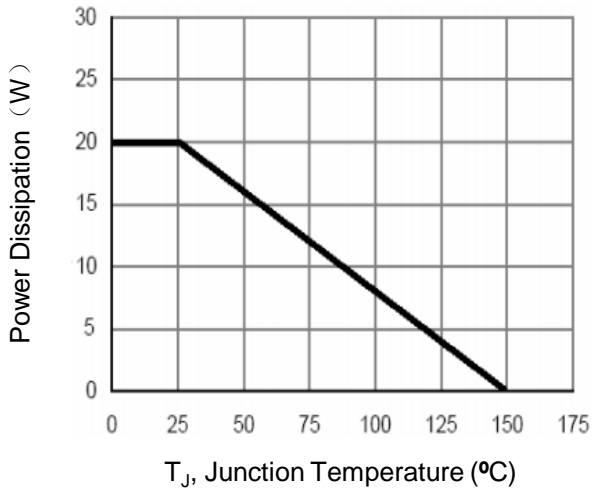


Figure 8. Safe Operation Area

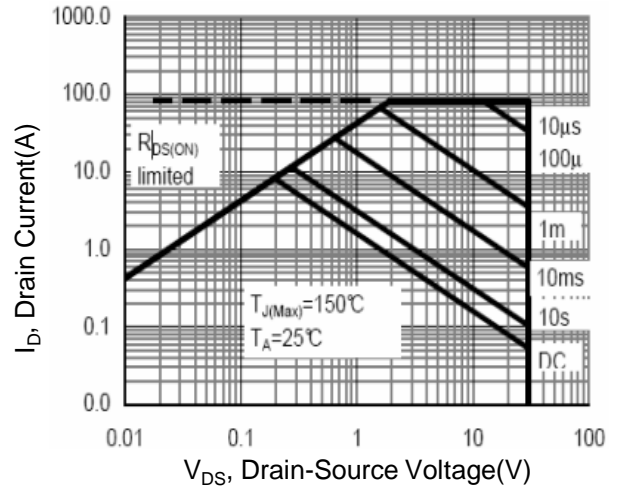
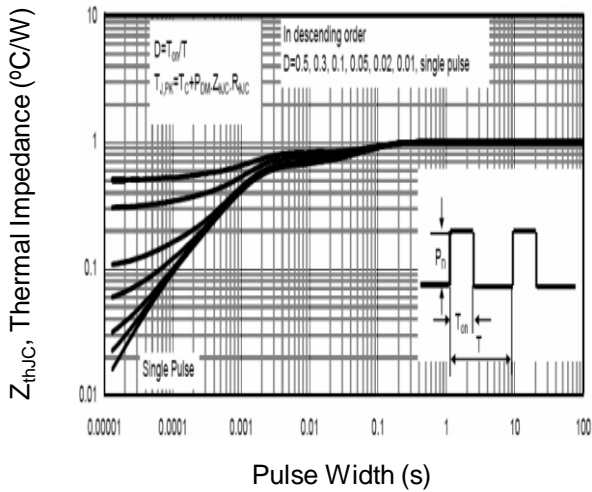
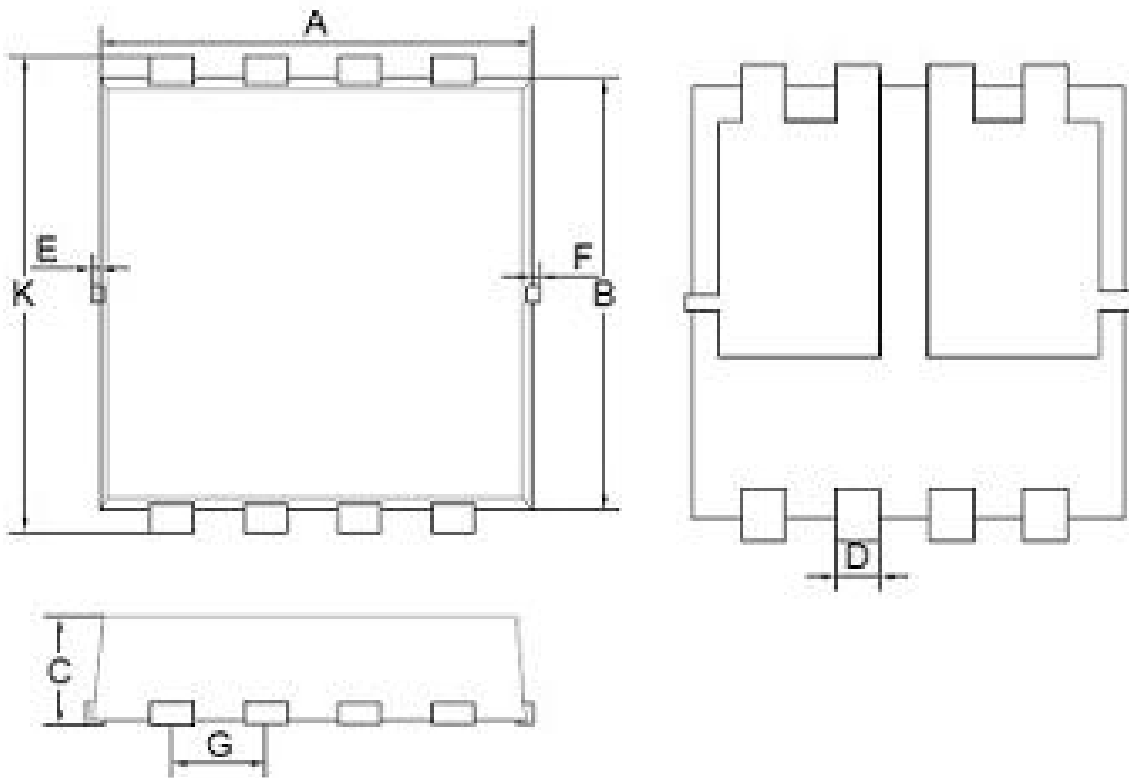


Figure 9. Normalized Maximum Transient Thermal Impedance



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		