

N-Channel Trench MOSFET

<p>Description</p> <p>The G6N02L 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} 20V ● I_D (at $V_{GS} = 10V$) 6A ● $R_{DS(ON)}$ (at $V_{GS} = 4.5V$) < 11.3mΩ ● $R_{DS(ON)}$ (at $V_{GS} = 2.5V$) < 14.1mΩ ● 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>SOT-23-3L</p>	
Device	Package	Marking	Packaging
G6N02L	SOT-23-3L	G6N02	3000pcs/Reel

Absolute Maximum Ratings $T_C = 25^\circ C$, unless otherwise noted			
Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	20	V
Continuous Drain Current	I_D	6	A
Pulsed Drain Current (note1)	I_{DM}	24	A
Gate-Source Voltage	V_{GS}	± 12	V
Power Dissipation	P_D	1.8	W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 To 150	$^\circ C$

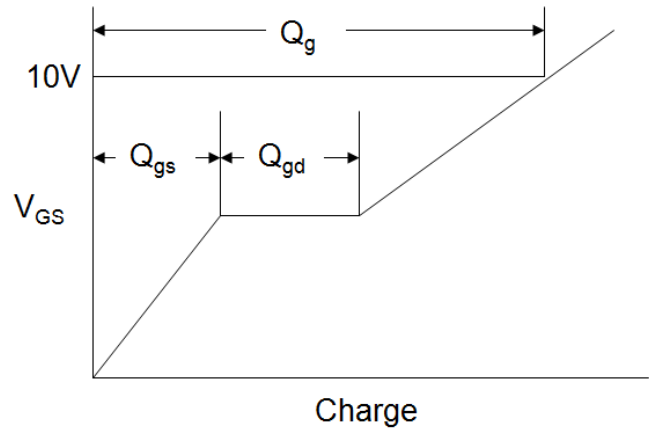
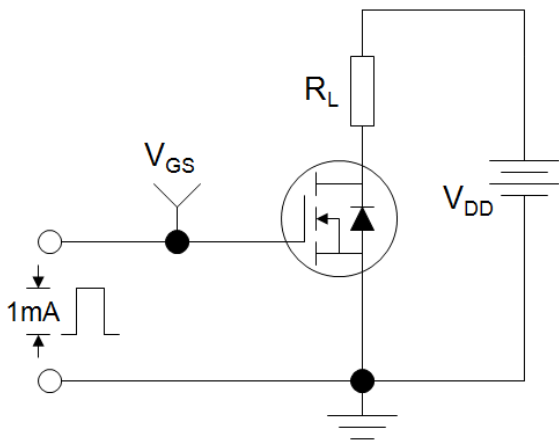
Thermal Resistance			
Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Ambient	R_{thJA}	80	$^\circ C/W$

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	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	20	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 20V, V_{GS} = 0V$	--	--	1	μA
Gate-Source Leakage	I_{GSS}	$V_{GS} = \pm 12V$	--	--	± 100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	0.5	0.7	0.9	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = 4.5V, I_D = 3A$	--	10	11.3	m Ω
		$V_{GS} = 2.5V, I_D = 3A$	--	12	14.1	
Forward Transconductance	g_{FS}	$V_{DS}=5V, I_D=6A$	--	50	--	S
Dynamic Parameters						
Input Capacitance	C_{iss}	$V_{GS} = 0V,$ $V_{DS} = 10V,$ $f = 1.0MHz$	--	1140	--	pF
Output Capacitance	C_{oss}		--	165	--	
Reverse Transfer Capacitance	C_{rss}		--	110	--	
Total Gate Charge	Q_g	$V_{DD} = 4.5V,$ $I_D = 6A,$ $V_{GS} = 10V$	--	12.5	--	nC
Gate-Source Charge	Q_{gs}		--	1.2	--	
Gate-Drain Charge	Q_{gd}		--	2.7	--	
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = 4.5V,$ $I_D = 3A,$ $R_G = 3\Omega$	--	2.7	--	ns
Turn-on Rise Time	t_r		--	3	--	
Turn-off Delay Time	$t_{d(off)}$		--	37	--	
Turn-off Fall Time	t_f		--	7	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	$T_C = 25^\circ\text{C}$	--	--	6	A
Body Diode Voltage	V_{SD}	$T_J = 25^\circ\text{C}, I_{SD} = 1A, V_{GS} = 0V$	--	0.6	1	V

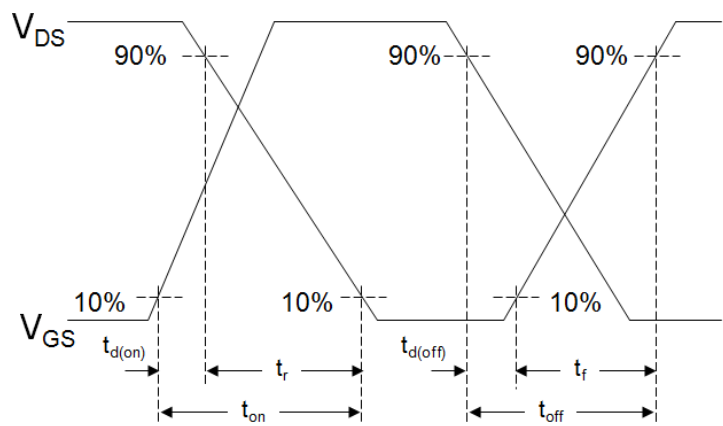
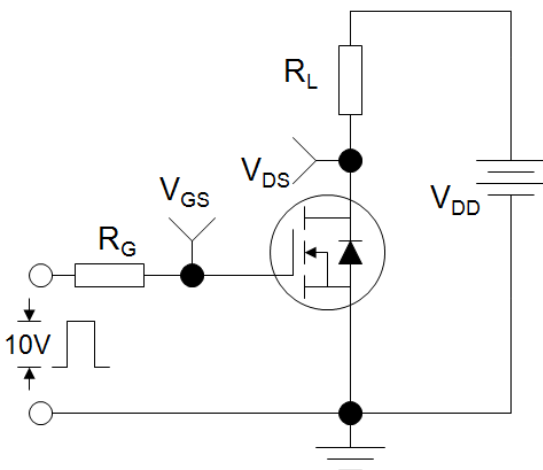
Notes

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

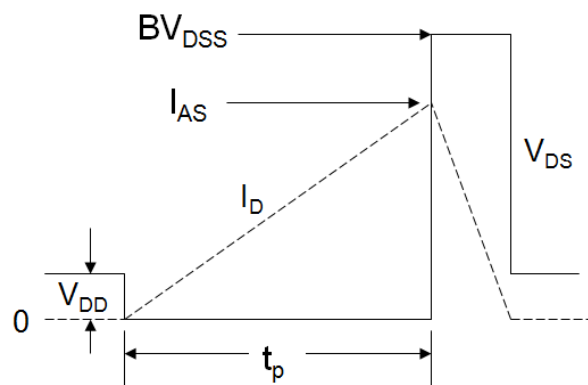
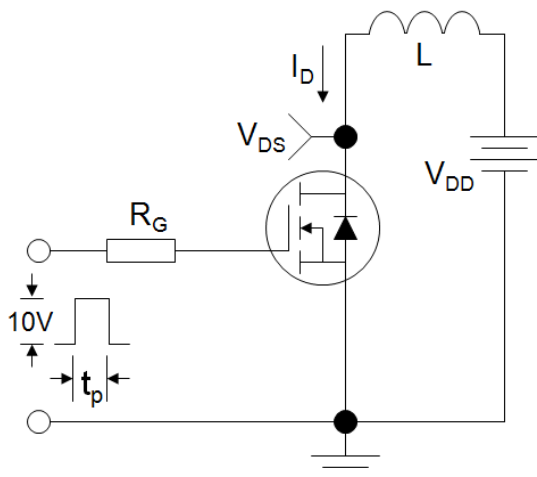
Gate Charge Test Circuit



Switch Time Test Circuit



EAS Test Circuit



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

Figure 1. Output Characteristics

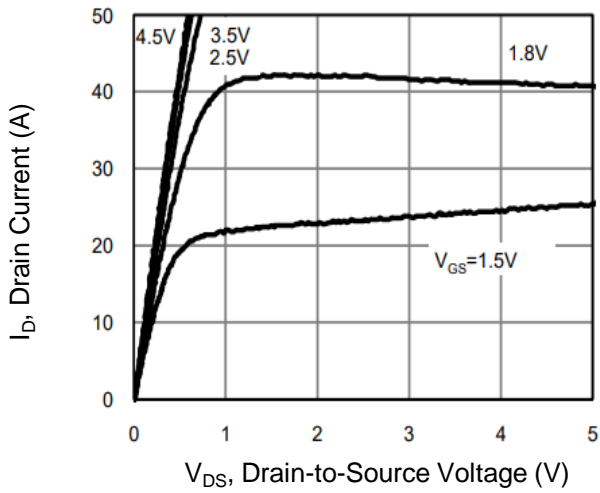


Figure 2. Transfer Characteristics

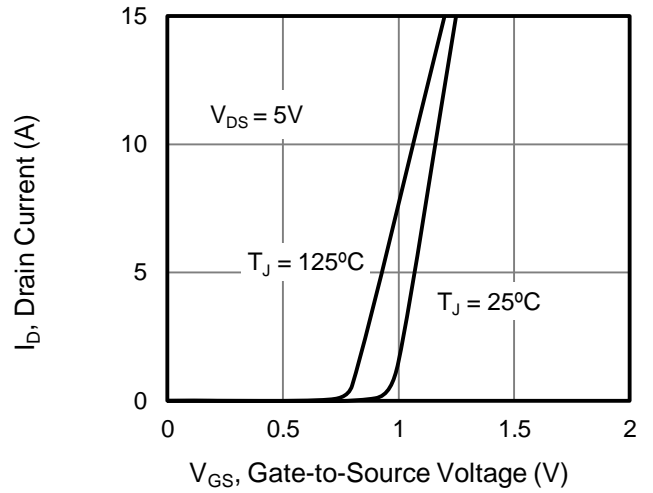


Figure 3. Drain Source On Resistance

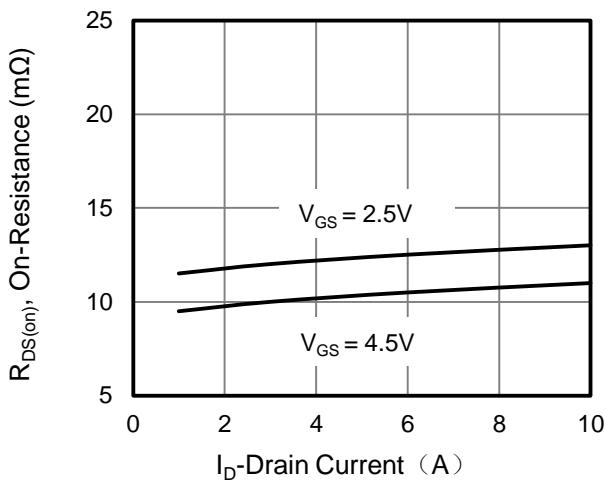


Figure 4. Gate Charge

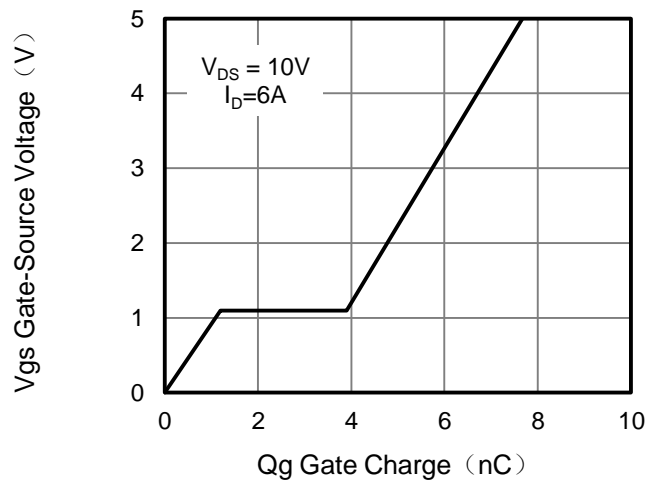


Figure 5. Capacitance vs Vds

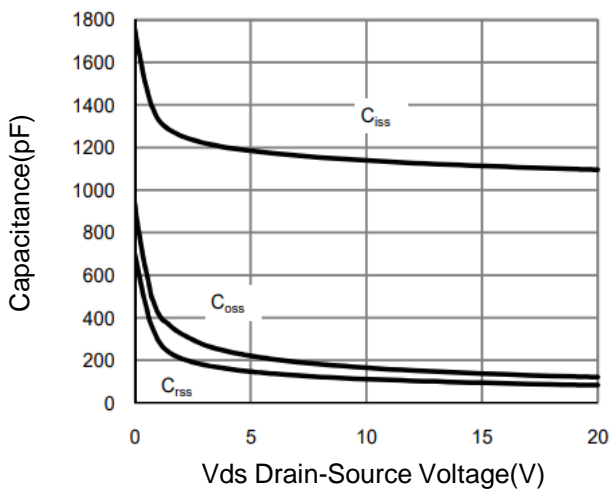
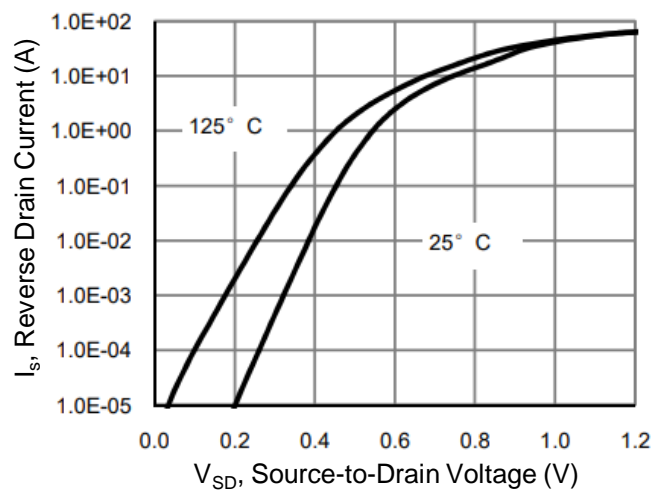


Figure 6. Source-Drain Diode Forward



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

Figure 7. Drain-Source On-Resistance

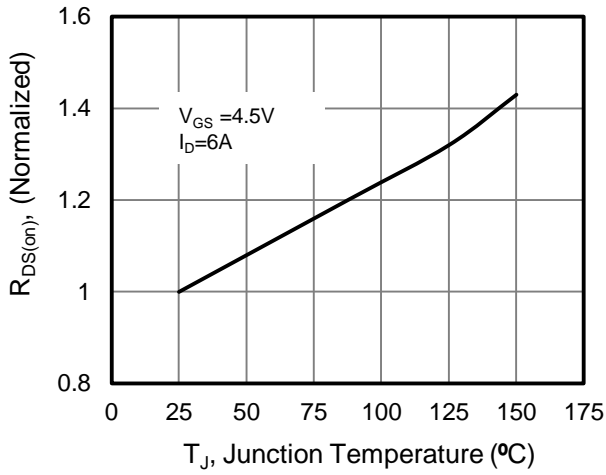


Figure 8. Safe Operation Area

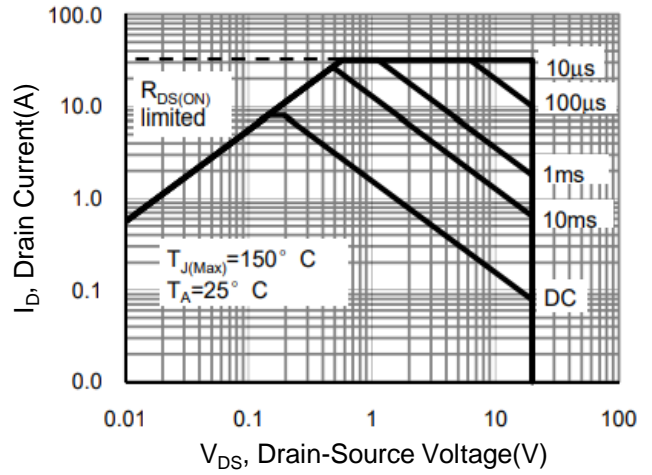
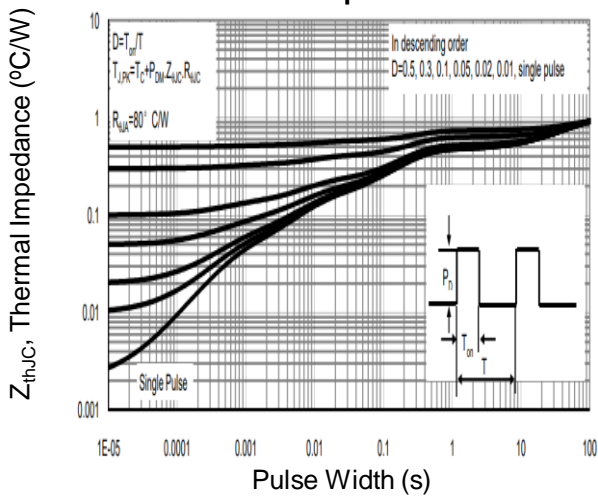
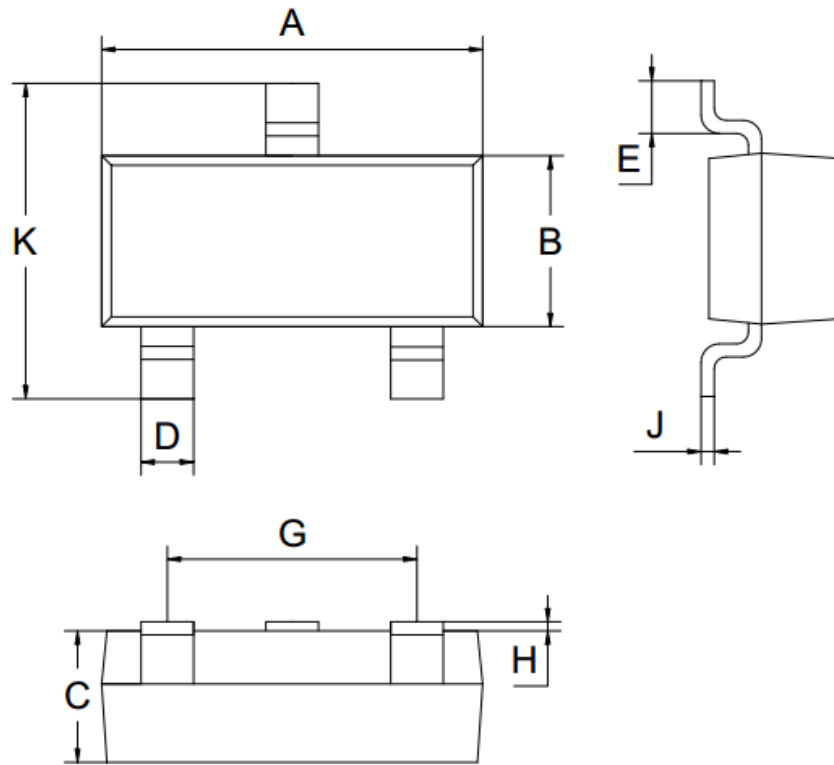


Figure 9. Normalized Maximum Transient Thermal Impedance



SOT-23-3L Package Information



Symbol	Dimensions in Millimeters		
	MIN.	NOM.	MAX.
A	2.80	2.90	3.00
B	1.50	1.60	1.70
C	1.00	1.10	1.20
D	0.30	0.40	0.50
E	0.25	0.40	0.55
G	1.90		
H	0.00	-	0.10
J	0.047	0.127	0.207
K	2.60	2.80	3.00
All Dimensions in mm			