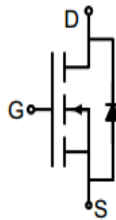
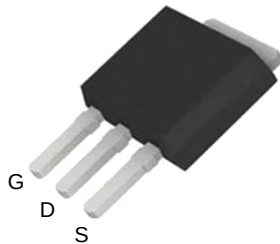


N-Channel Enhancement Mode Power MOSFET

Description The G50N03J uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. It can be used in a wide variety of applications.		 Schematic diagram  TO-251	
General Features • V_{DS} 30V • I_D (at $V_{GS} = 10V$) 65A • $R_{DS(ON)}$ (at $V_{GS} = 10V$) < 7mΩ • $R_{DS(ON)}$ (at $V_{GS} = 4.5V$) < 12mΩ • 100% Avalanche Tested • RoHS Compliant			
Application • Power switch • DC/DC converters			
Device	Package	Marking	Packaging
G50N03J	TO-251	G50N03	75pcs/Tube

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	30	V
Continuous Drain Current	I_D	65	A
Pulsed Drain Current (note1)	I_{DM}	260	A
Gate-Source Voltage	V_{GS}	± 20	V
Power Dissipation	P_D	48	W
Single pulse avalanche energy (note3)	E_{AS}	43	mJ
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 To 150	$^\circ\text{C}$

Thermal Resistance

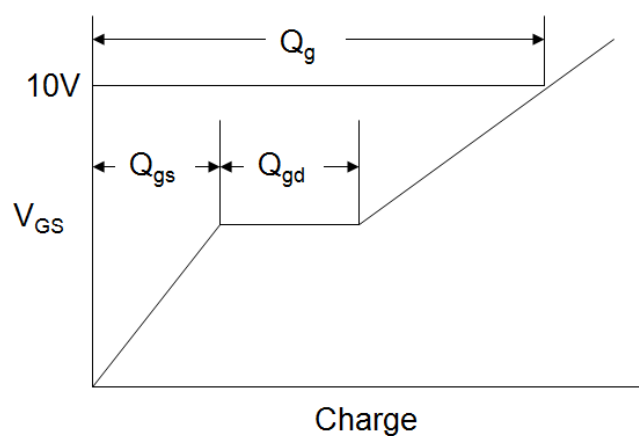
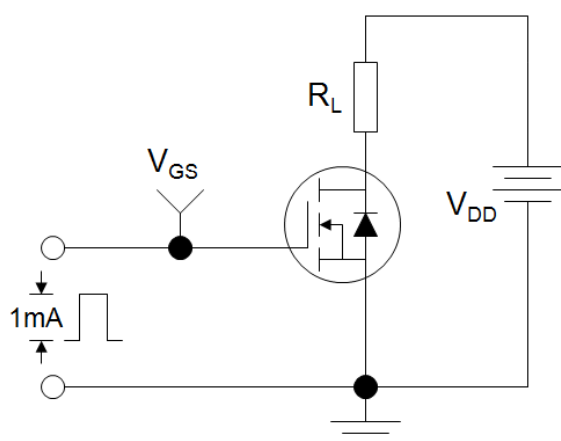
Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case	R_{thJC}	2.59	$^\circ\text{C/W}$

Specifications T _j = 25°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 = 250μA	30	--	--	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 30V, V _{GS} = 0V	--	--	1	μA
Gate-Source Leakage	I _{GSS}	V _{GS} = ±20V	--	--	±100	nA
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	1	1.45	2.5	V
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} = 10V, I _D = 20A	--	5.0	7	mΩ
		V _{GS} = 4.5V, I _D = 15A	--	7.2	12	
Forward Transconductance	g _{FS}	V _{DS} =5V,I _D =20A	--	33	--	S
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{GS} = 0V, V _{DS} = 15V, f = 1.0MHz	--	1255	--	pF
Output Capacitance	C _{oss}		--	232	--	
Reverse Transfer Capacitance	C _{rss}		--	185	--	
Total Gate Charge	Q _g	V _{DD} = 10V, I _D = 20A, V _{GS} = 10V	--	16.6	--	nC
Gate-Source Charge	Q _{gs}		--	3.6	--	
Gate-Drain Charge	Q _{gd}		--	3	--	
Turn-on Delay Time	t _{d(on)}	V _{DD} = 15V, I _D = 20A, R _G = 1.8Ω	--	10	--	ns
Turn-on Rise Time	t _r		--	8	--	
Turn-off Delay Time	t _{d(off)}		--	30	--	
Turn-off Fall Time	t _f		--	5	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I _S	T _C = 25°C	--	--	65	A
Body Diode Voltage	V _{SD}	T _J = 25°C, I _{SD} = 30A, V _{GS} = 0V	--	--	1.2	V

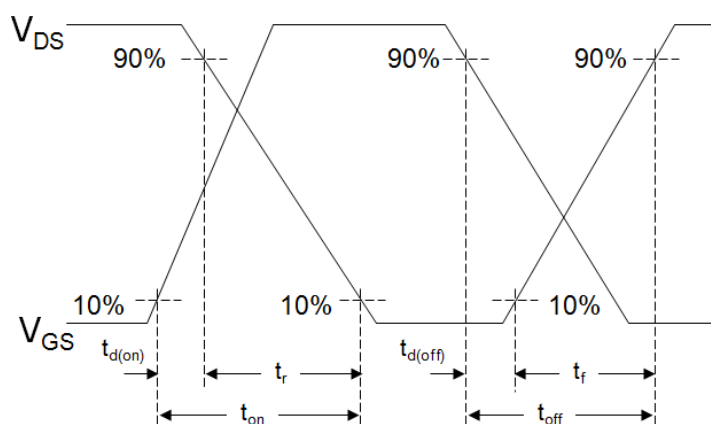
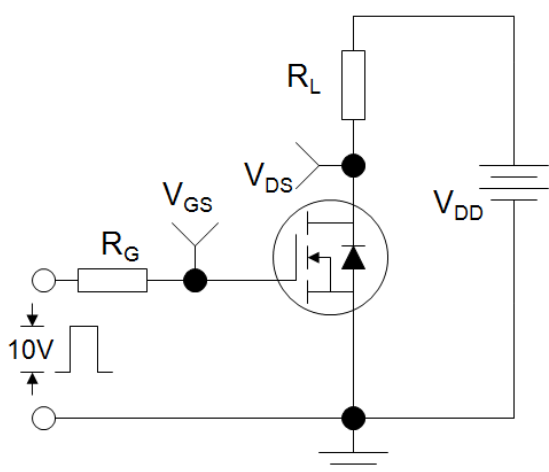
Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. Identical low side and high side switch with identical R_G
3. EAS condition : $T_J=25^{\circ}\text{C}$, $V_{DD}=30V, V_{GS}=10V, L=0.5mH, R_g=25\Omega$

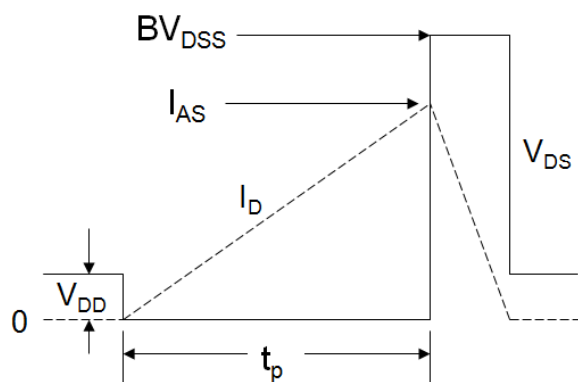
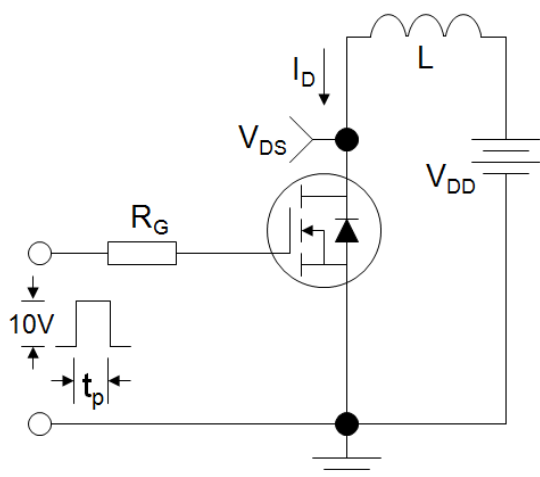
Gate Charge Test Circuit



Switch Time Test Circuit



EAS Test Circuit



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

Figure 1. Output Characteristics

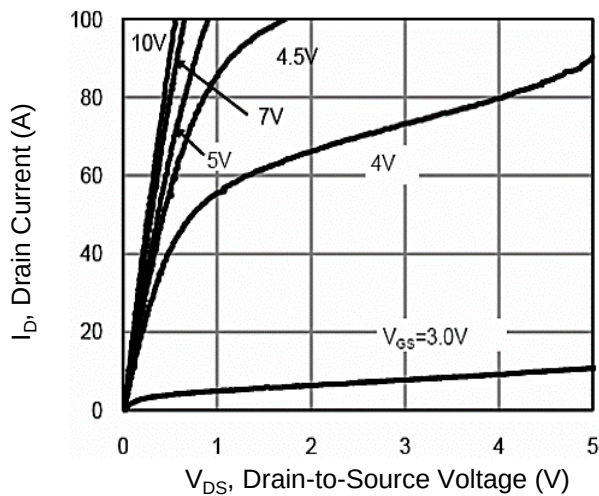


Figure 2. Transfer Characteristics

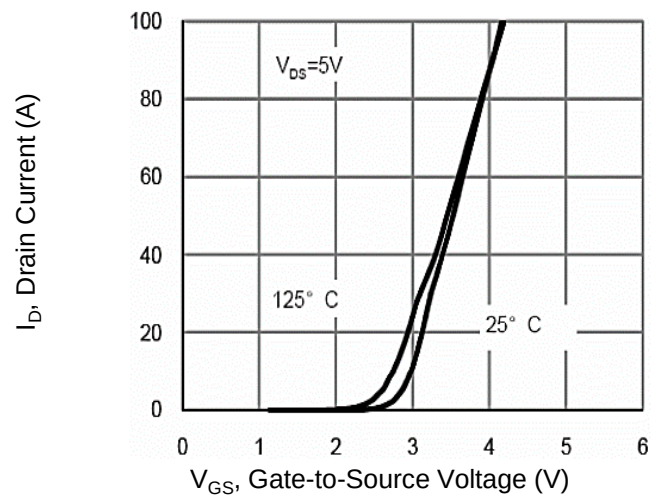


Figure 3. Gate Charge

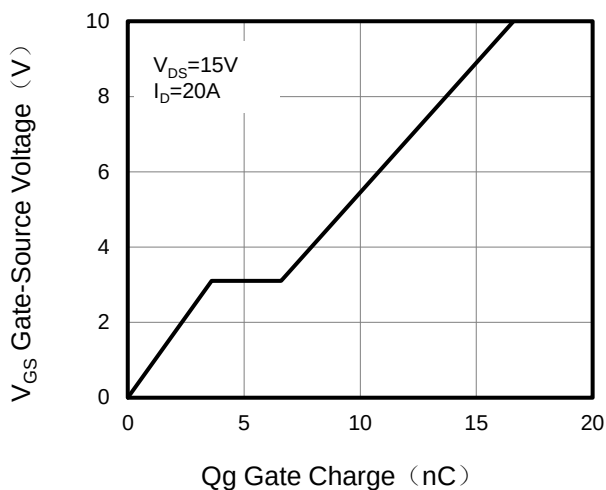


Figure 4. Drain Source On Resistance

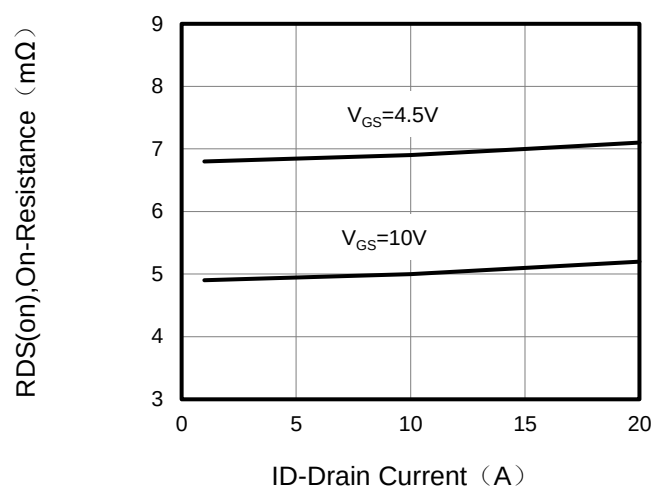


Figure 5. Capacitance

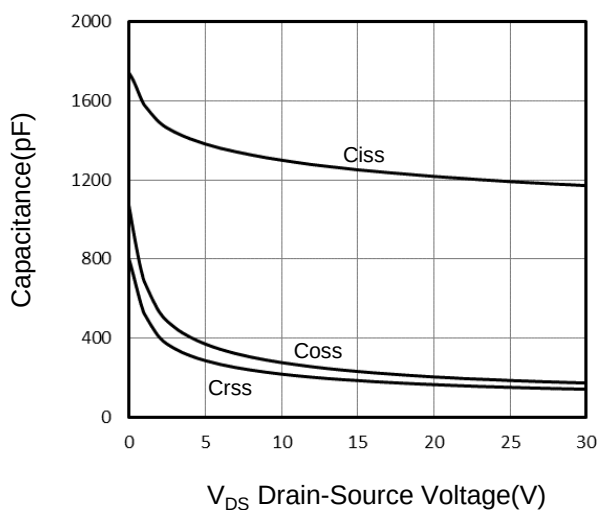
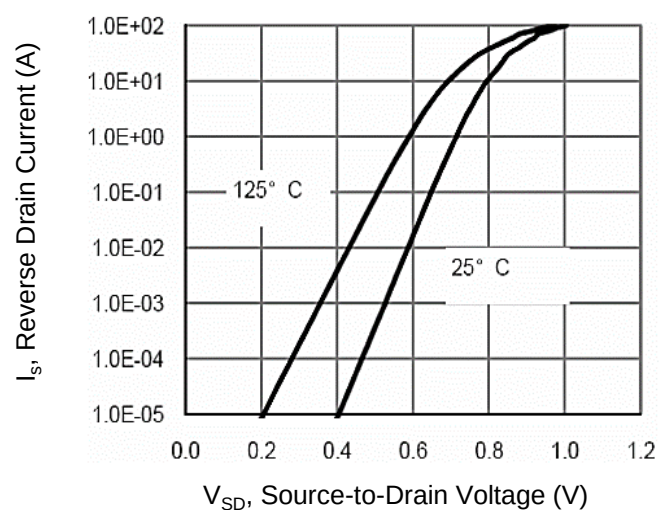


Figure 6. Source-Drain Diode Forward



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

Figure 7. Drain-Source On-Resistance

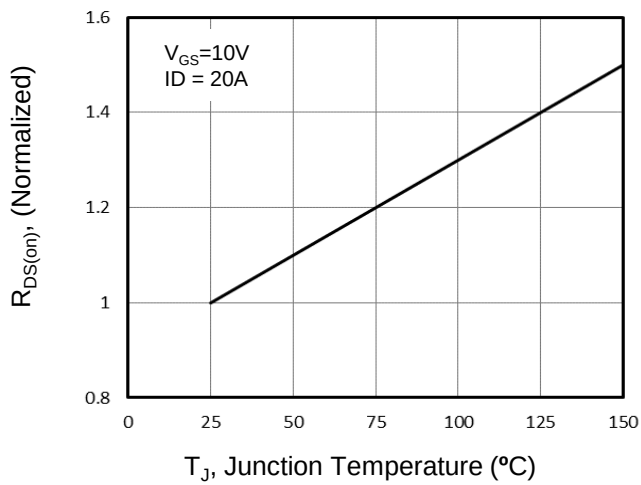


Figure 8. Safe Operation Area

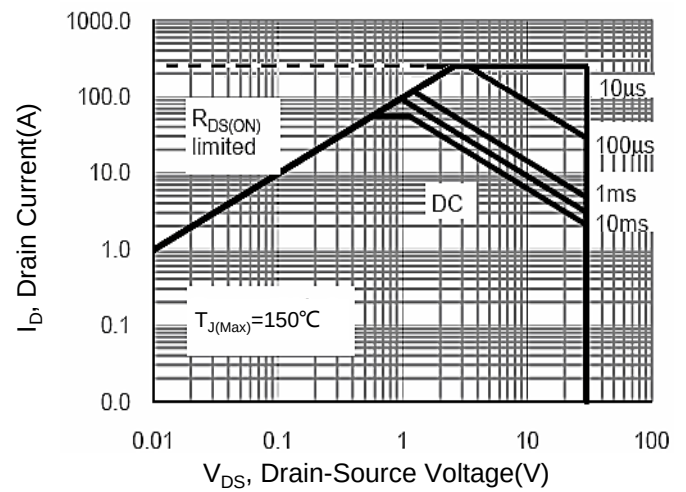
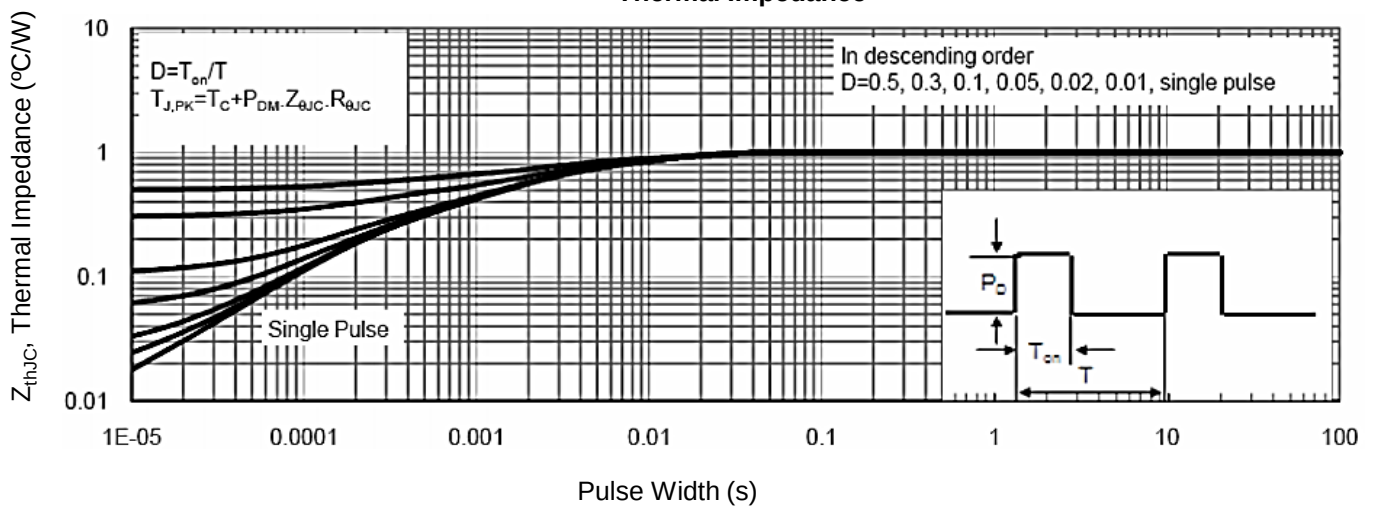
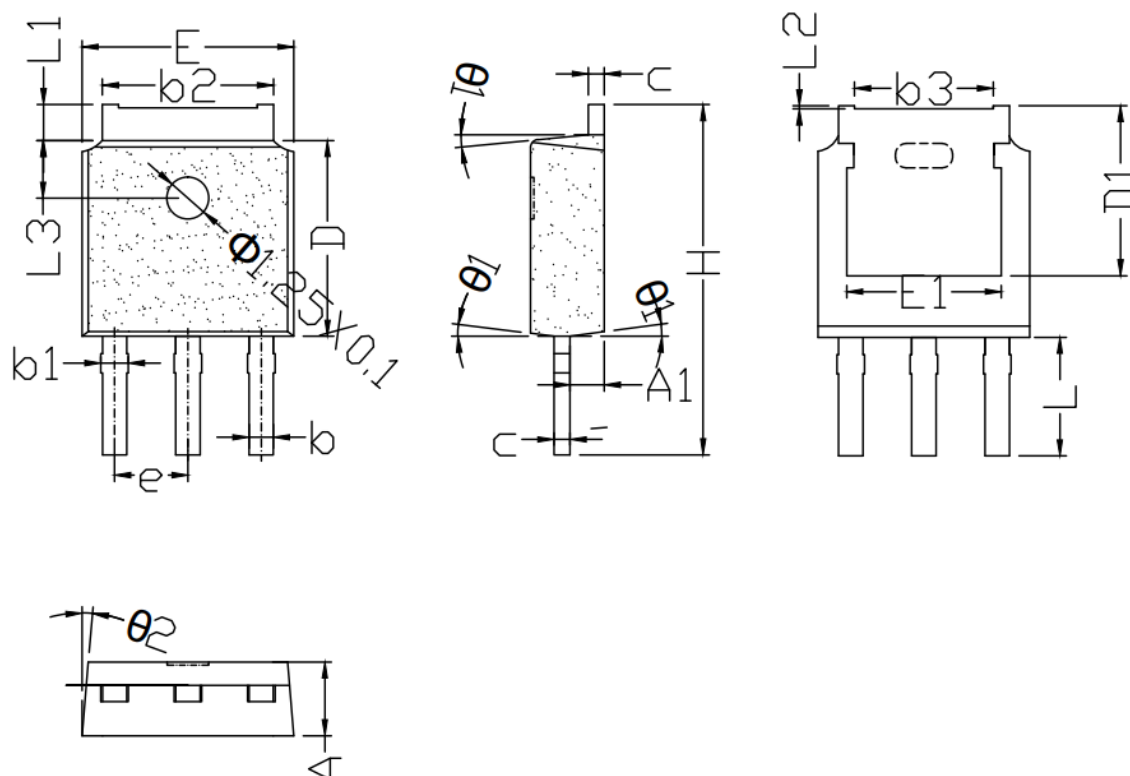


Figure 9. Normalized Maximum Transient Thermal Impedance



TO-251 Package information



COMMON DIMENSIONS

SYMBOL	mm		
	MIN	NOM	MAX
*A	2.20	2.30	2.38
*A1	0.90	1.00	1.10
*b	0.72	0.78	0.85
*b1	0.78	0.85	0.90
b2	5.23	5.33	5.46
b3	4.27	4.32	4.37
*c	0.47	0.52	0.55
*D	6.00	6.10	6.20
D1	5.40REF		
*E	6.50	6.60	6.70
E1	4.70	4.83	4.92
*e	2.286BSC		
*H	9.90	10.10	10.20
*L	3.60	3.70	3.80
L1	0.90	—	1.20
L2	0.02	0.04	0.08
L3	1.70	1.80	1.90
01	$\pm$	F°	9°
02	$\pm$	F°	9°