N-Channel Enhancement Mode Power MOSFET

Description

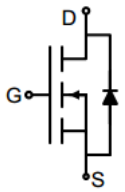
The GT52N10T uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. It can be used in a wide variety of applications.

General Features

- V_{DS} 100V
- I_D (at V_{GS} = 10V) 80A
- $R_{DS(ON)}$ (at V_{GS} = 10V) < 9mΩ
- $R_{DS(ON)}$ (at V_{GS} = 4.5V) < 15mΩ
- 100% Avalanche Tested
- RoHS Compliant

Application

- Power switch
- DC/DC converters
- Synchronous Rectification



Schematic Diagram

Marking and pin assignment

TO-220

Device	Package	Marking	Packaging
GT52N10T	TO-220	GT52N10	50pcs/Tube

Absolute Maximum Ratings T_C = 25ºC, unless otherwise noted

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	100	V
Continuous Drain Current	I_D	80	A
Pulsed Drain Current (note1)	I_{DM}	320	A
Gate-Source Voltage	V_{GS}	±20	V
Power Dissipation	P_D	227	W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 To 150	ºC

Thermal Resistance

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case	R_{thJC}	0.55	ºC/W

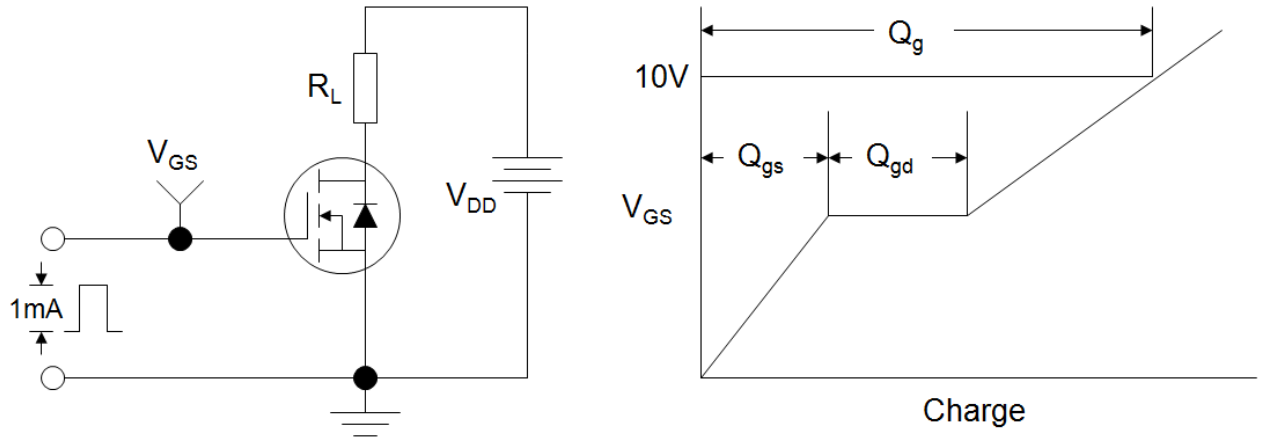
Specifications T_J = 25ºC, unless otherwise noted

Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static Parameters						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	100	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 100V, 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	1.4	1.7	2.2	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 50A	--	7.5	9	mΩ
		V_{GS} = 4.5V, I_D = 50A	--	9.2	15	
Forward Transconductance	g_{FS}	V_{DS}=5V,I_D=50A	--	115	--	S
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 50V, f = 1.0MHz	--	2626	--	pF
Output Capacitance	C_{oss}		--	457	--	
Reverse Transfer Capacitance	C_{rss}		--	38	--	
Total Gate Charge	Q_g	V_{DD} = 50V, I_D = 50A, V_{GS} = 10V	--	44.5	--	nC
Gate-Source Charge	Q_{gs}		--	10.4	--	
Gate-Drain Charge	Q_{gd}		--	6.8	--	
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 50V, I_D = 50A, R_G = 3Ω	--	10.3	--	ns
Turn-on Rise Time	t_r		--	62	--	
Turn-off Delay Time	$t_{d(off)}$		--	30	--	
Turn-off Fall Time	t_f		--	98	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	T_C = 25ºC	--	--	80	A
Body Diode Voltage	V_{SD}	T_J = 25ºC, I_{SD} = 50A, V_{GS} = 0V	--	--	1.2	V

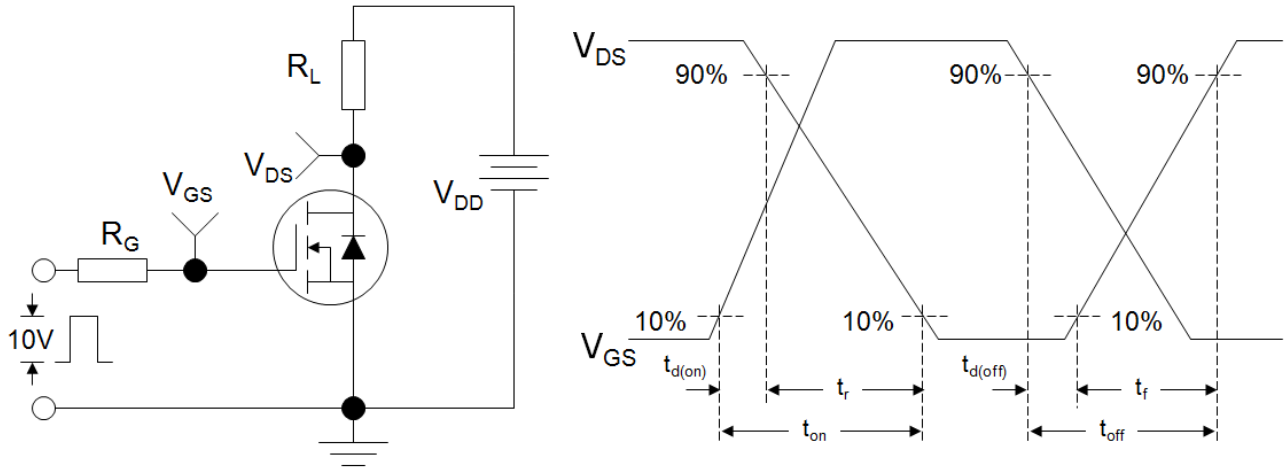
Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. I_{AS} = 20A, V_{DD} = 40V, R_G = 25Ω, Starting T_J = 25°C
3. Identical low side and high side switch with identical R_G

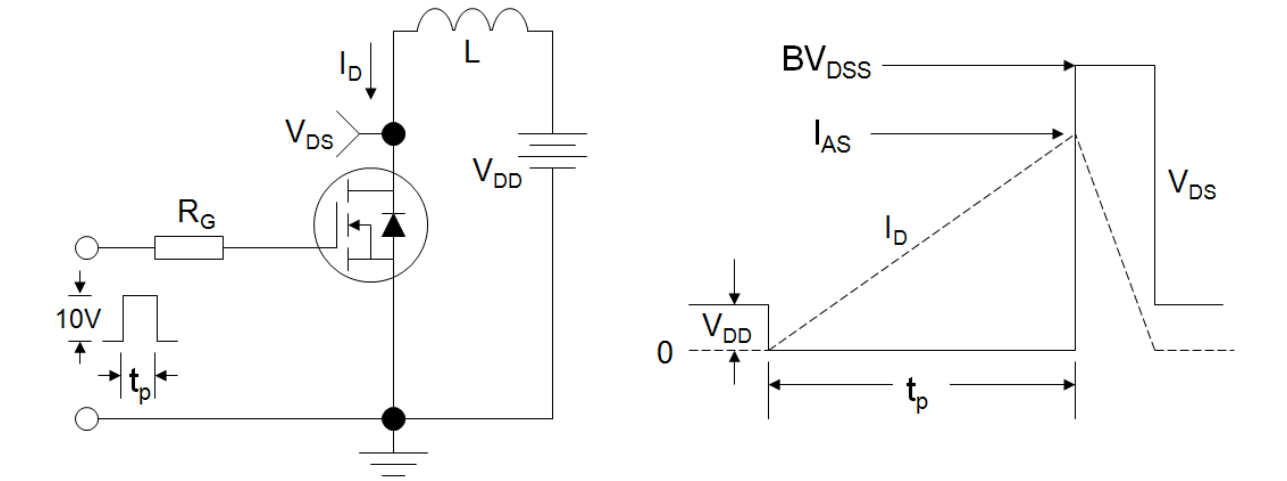
Gate Charge Test Circuit



EAS Test Circuit



Switch Time Test Circuit



Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 1. Output Characteristics

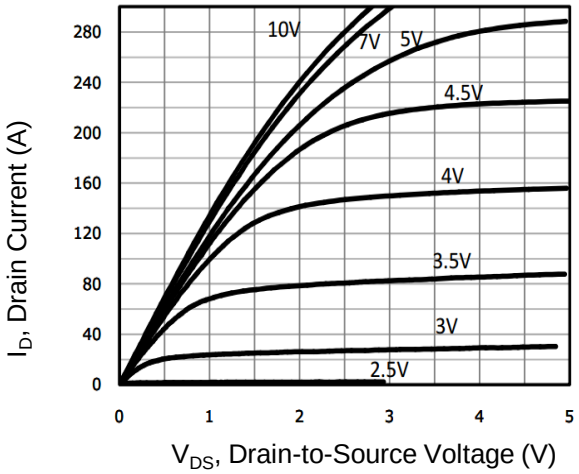


Figure 2. Transfer Characteristics

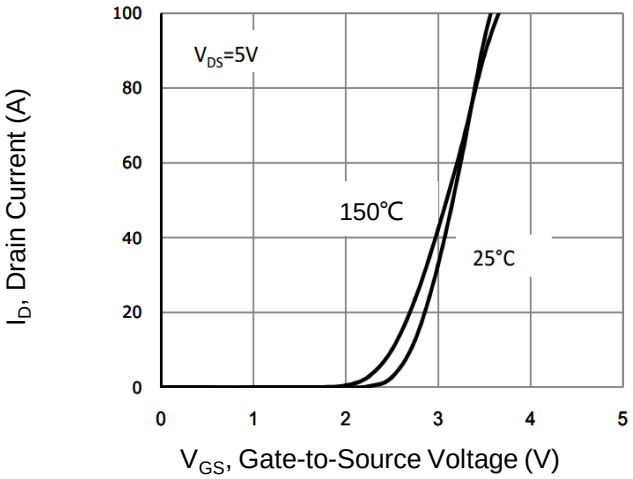


Figure 3. Gate Charge

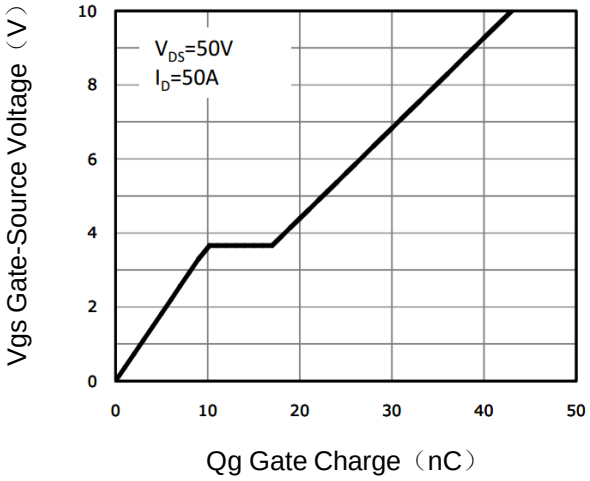


Figure 4. Drain Source On Resistance

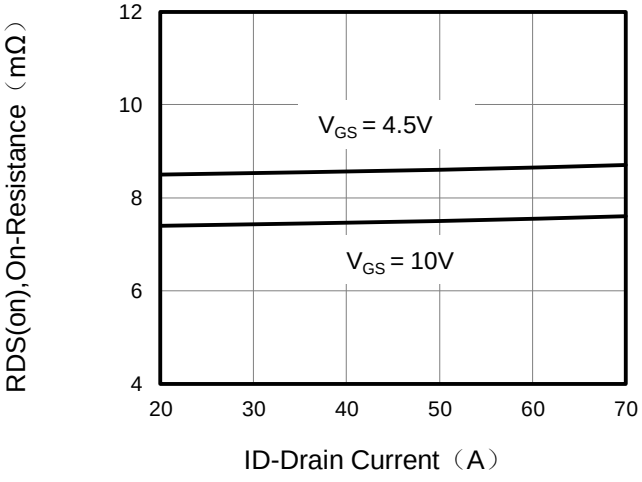


Figure 5. Capacitance vs Vds

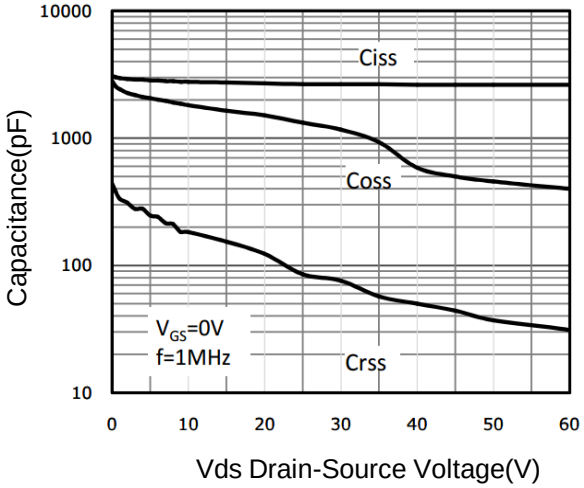
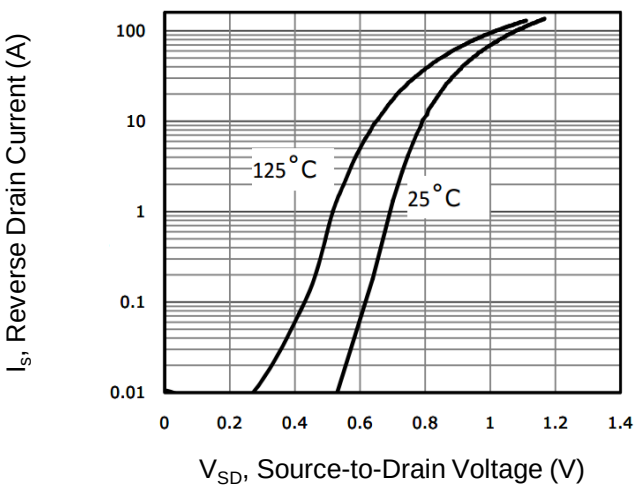


Figure 6. Source-Drain Diode Forward



Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 7. Drain-Source On-Resistance

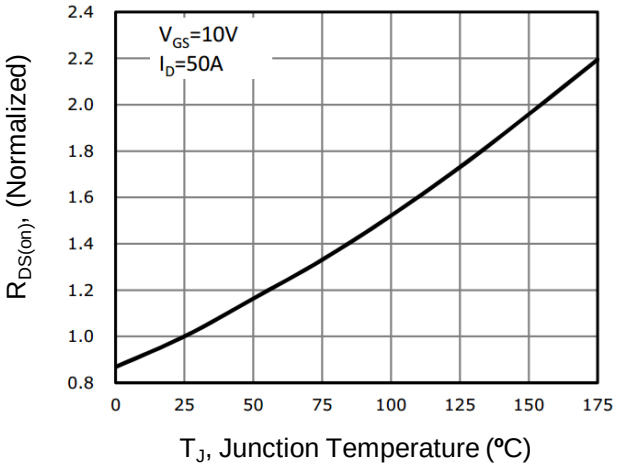


Figure 8. Safe Operation Area

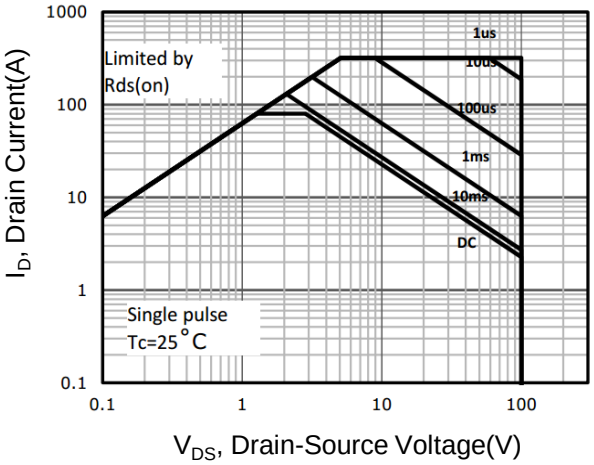
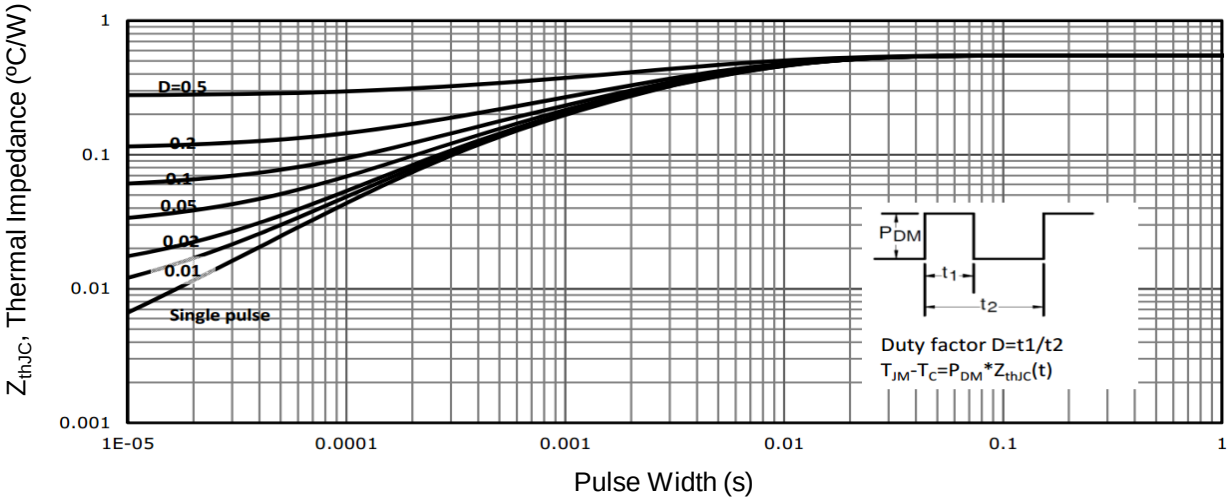
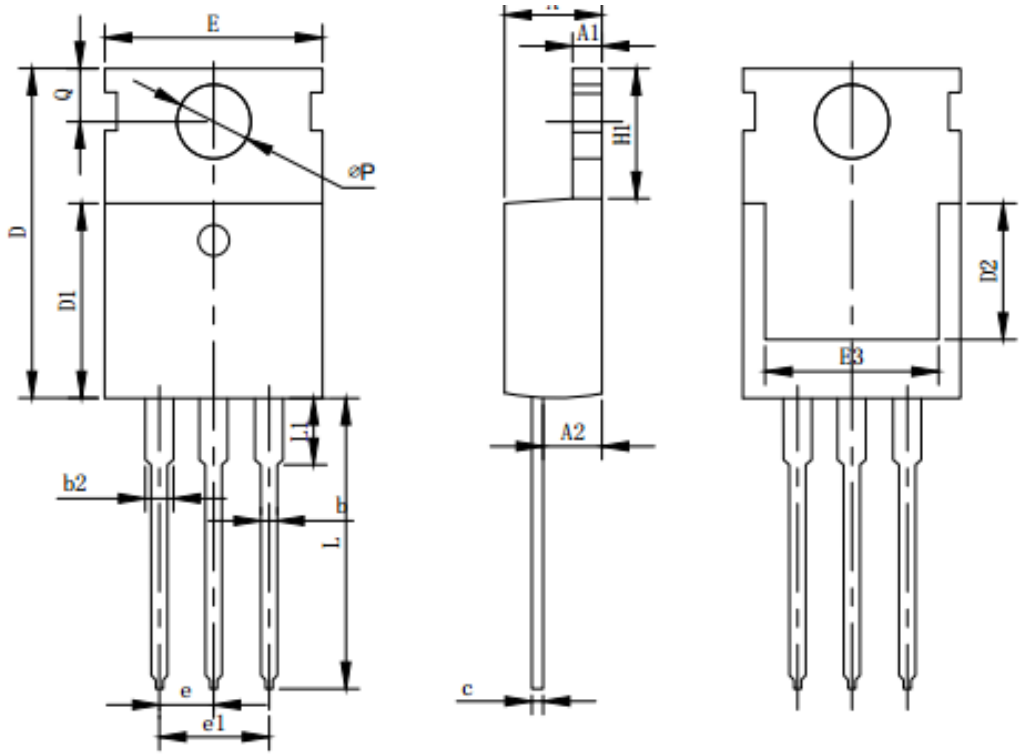


Figure 9. Normalized Maximum Transient Thermal Impedance



TO-220 Package Information



Symbol	Dimensions in Millimeters		
	MIN.	NOM.	MAX.
A	4.37	4.57	4.7
A1	1.25	1.3	1.4
A2	2.2	2.4	2.6
b	0.7	0.8	0.95
b2	1.7	1.27	1.47
c	0.45	0.5	0.6
D	15.1	15.6	16.1
D1	8.8	9.1	9.4
D2	5.5		
E	9.7	10	10.3
e	2.54BSC		
e1	5.08BSC		
H1	6.25	6.5	6.85
L	12.75	13.5	13.8
L1		3.1	3.4
ØP	3.4	3.6	3.8
Q	2.6	2.8	3