N-Channel Enhancement Mode Power MOSFET

Description

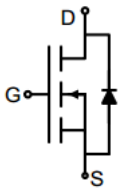
The GT52N10D5 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. It can be used in a wide variety of applications.

General Features

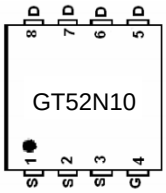
- V_{DS} 100V
- I_D (at V_{GS} = 10V) 71A
- $R_{DS(ON)}$ (at V_{GS} = 10V) < 7.5mΩ
- $R_{DS(ON)}$ (at V_{GS} = 4.5V) < 10mΩ
- 100% Avalanche Tested
- RoHS Compliant

Application

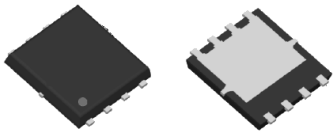
- Power switch
- DC/DC converters
- Synchronous Rectification



Schematic diagram



Marking and pin assignment



DFN5*6

Device	Package	Marking	Packaging
GT52N10D5	DFN5*6	GT52N10	5000pcs/Reel

Absolute Maximum Ratings T_C = 25ºC, unless otherwise noted

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	100	V
Continuous Drain Current	I_D	71	A
Pulsed Drain Current (note1)	I_{DM}	284	A
Gate-Source Voltage	V_{GSS}	±20	V
Power Dissipation	P_D	79	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-Ambient	R_{thJA}	47	ºC/W
Thermal Resistance, Junction-to-Case	R_{thJC}	1.58	ºC/W

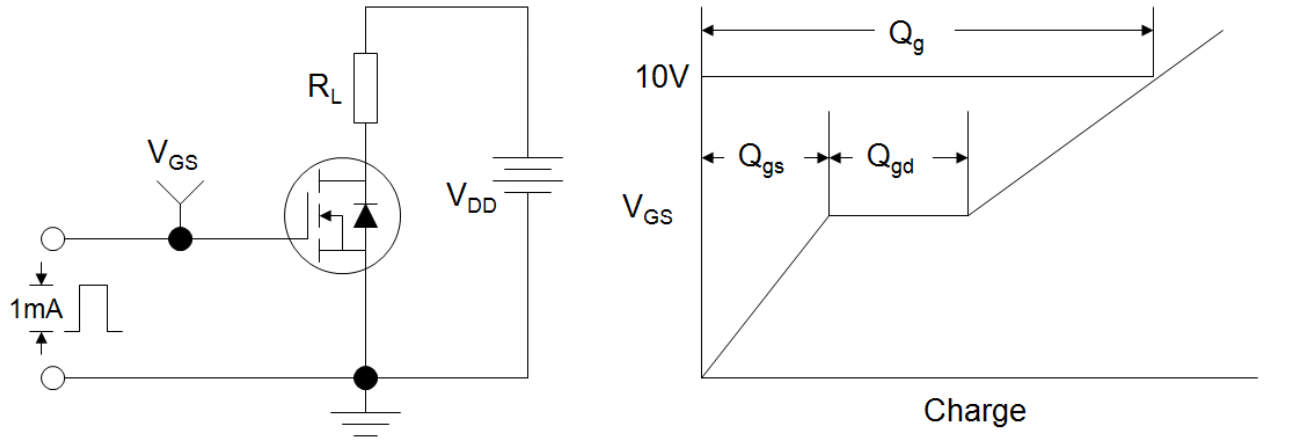
Specifications T_J = 25ºC, unless otherwise noted

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, T_J = 25ºC	--	--	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	1.65	2.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 50A	--	6.5	7.5	mΩ
		V_{GS} = 4.5V, I_D = 50A	--	8.5	10	
Forward Transconductance	g_{FS}	V_{DS}=5V,I_D=30A	--	91	--	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	--	--	71	A
Body Diode Voltage	V_{SD}	T_J = 25ºC, I_{SD} = 50A, V_{GS} = 0V	--	--	1.2	V

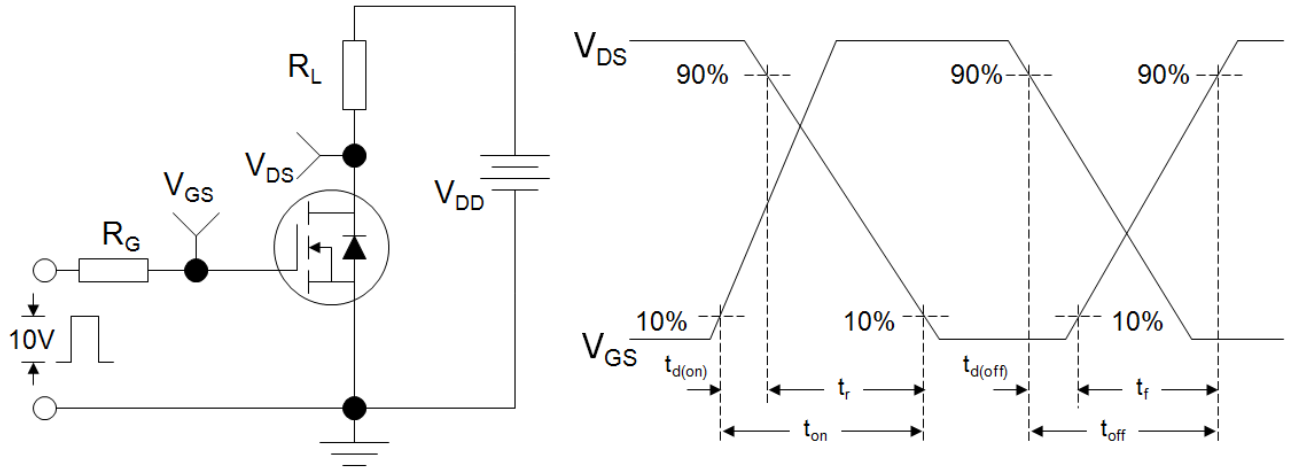
Notes

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

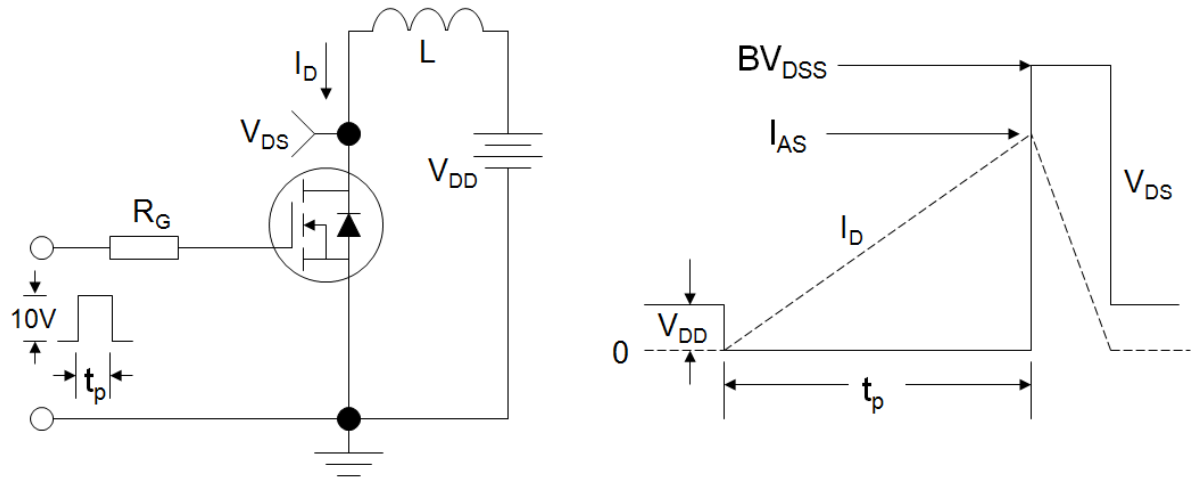
Gate Charge Test Circuit



EAS Test Circuit



Switch Time Test Circuit



Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 1. Output Characteristics

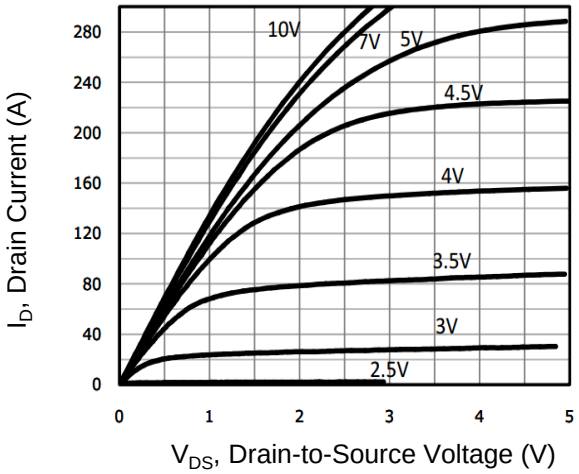


Figure 2. Transfer Characteristics

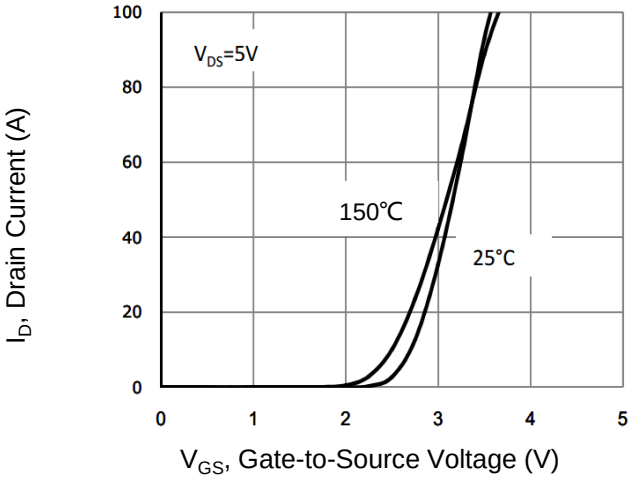


Figure 3.Rdson-Drain Current

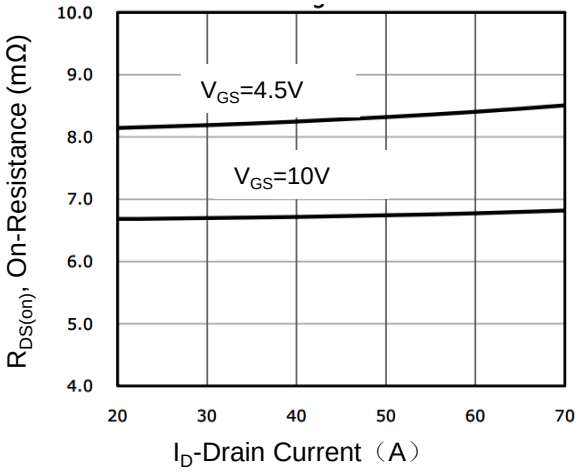


Figure 4. Gate Charge

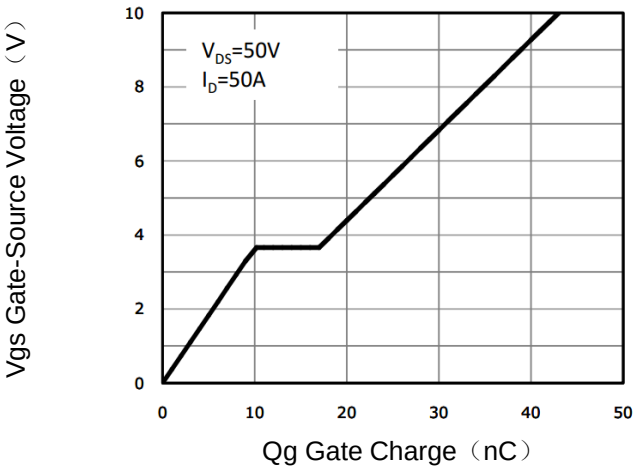


Figure 5. Capacitance vs Vds

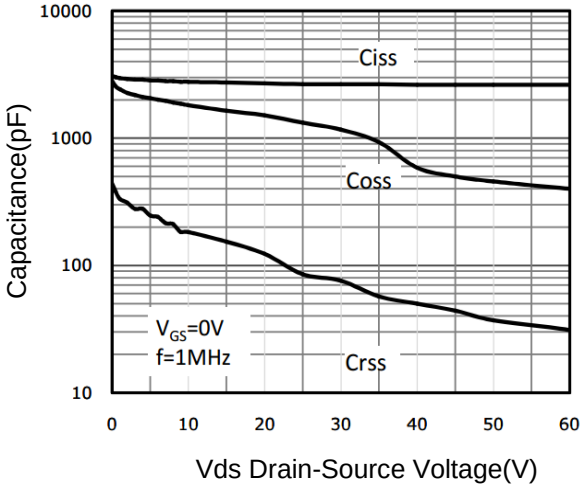
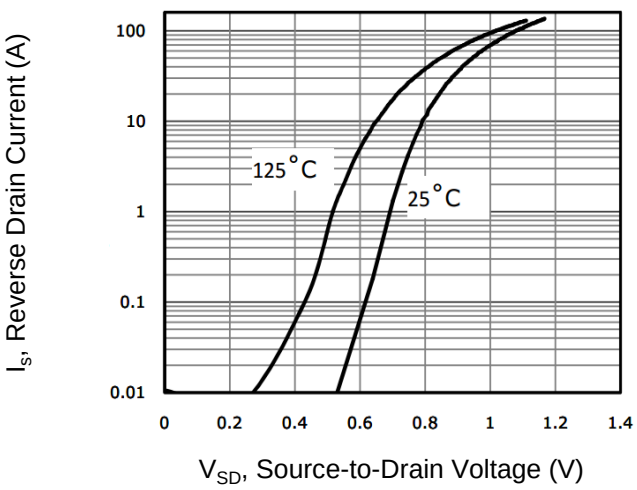


Figure 6. Source-Drain Diode Forward



Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 7. Drain-Source On-Resistance

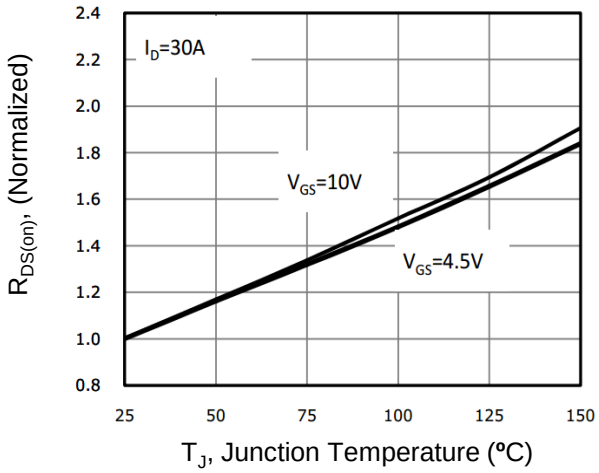


Figure 8. Safe Operation Area

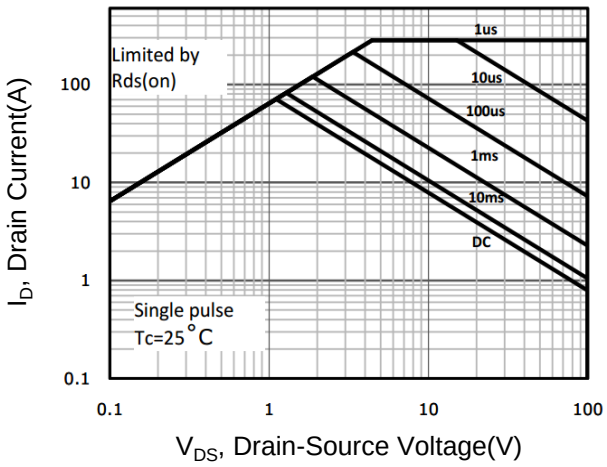
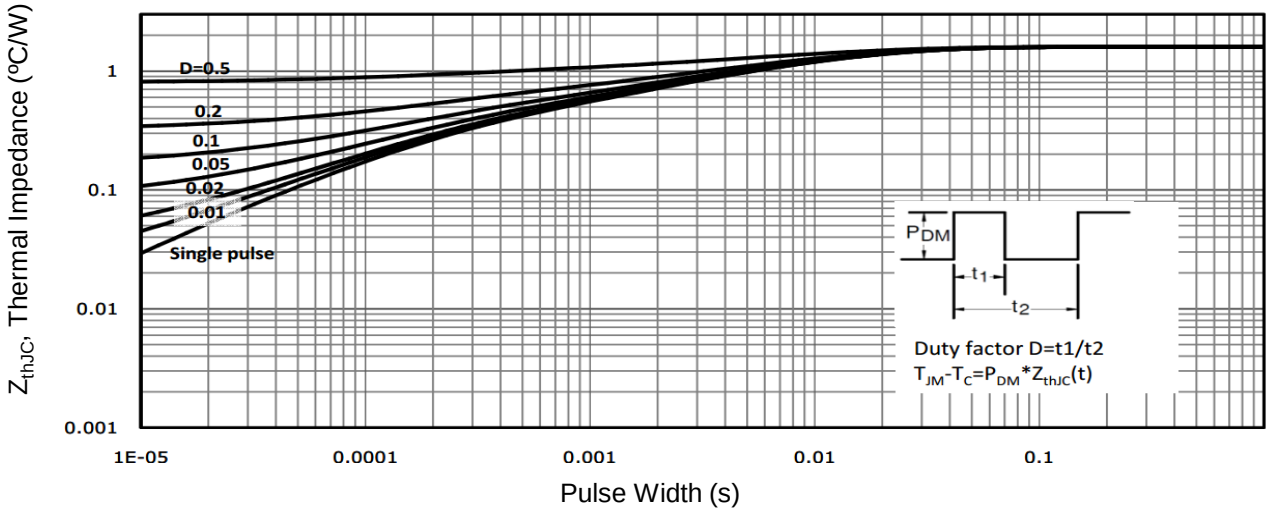
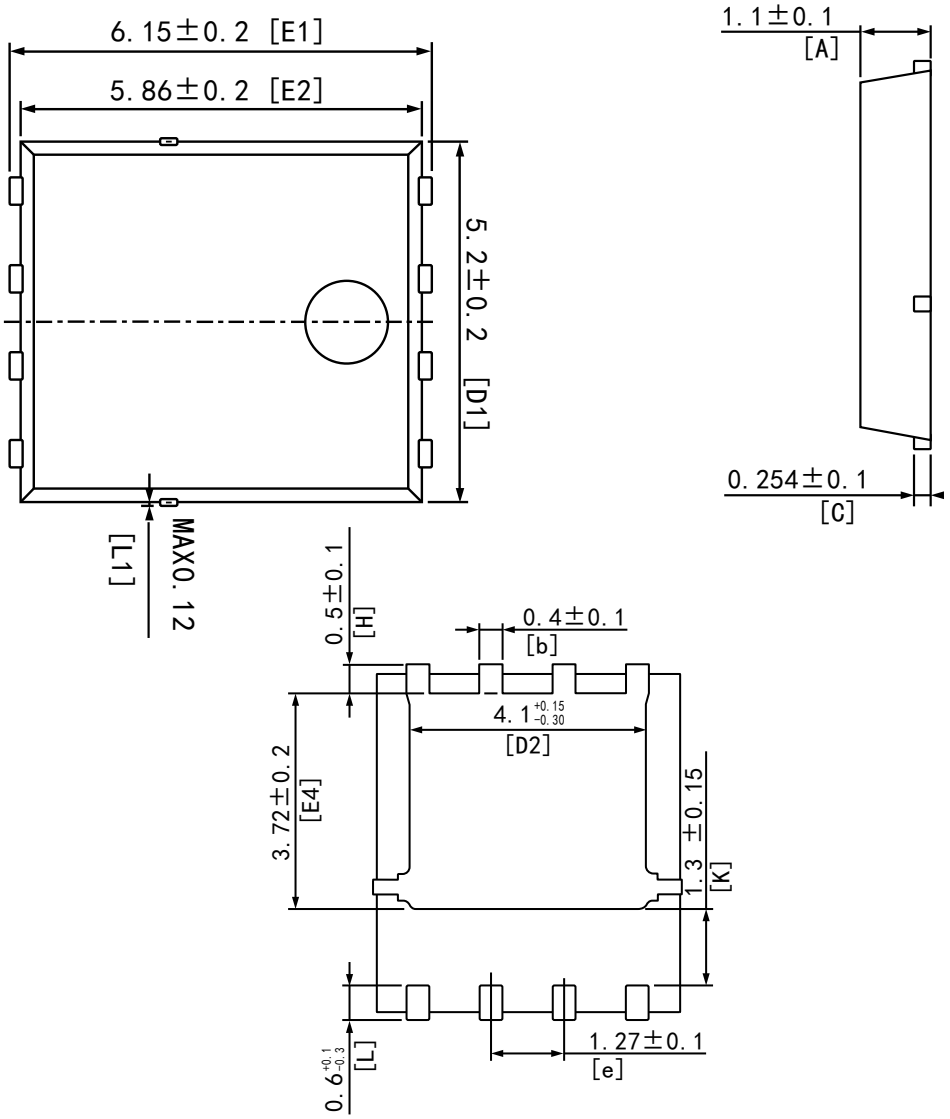


Figure 9. Normalized Maximum Transient Thermal Impedance



DFN5×6-8L Package Information



DIN	MIN	NOM	MAX
A	1.0	1.1	1.2
b	0.3	0.4	0.5
C	0.154	0.254	0.354
D1	5.0	5.2	5.4
D2	3.80	4.10	4.25
E1	5.95	6.15	6.35
E2	5.66	5.86	6.06
E4	3.52	3.72	3.92
e	1.17	1.27	1.37
H	0.4	0.5	0.6
K	1.15	1.30	1.45
L	0.3	0.6	0.7
L1	_	_	0.12
All dimensions in mm			