

N-Channel Enhancement Mode Power MOSFET

Description

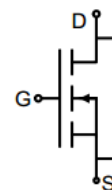
The GT045N10D5 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. It can be used in a wide variety of applications.

General Features

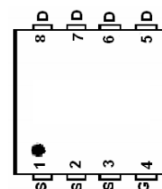
- V_{DS} 100V
- I_D (at $V_{GS} = 10V$) 80A
- $R_{DS(ON)}$ (at $V_{GS} = 10V$) $< 4.5m\Omega$
- $R_{DS(ON)}$ (at $V_{GS} = 4.5V$) $< 6.3m\Omega$
- 100% Avalanche Tested
- RoHS Compliant

Application

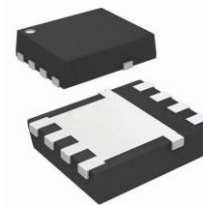
- Synchronous Rectification in SMPS or LED Driver
- UPS
- Motor Control
- BMS
- High Frequency Circuit



Schematic Diagram



Marking and pin assignment



DFN5*6-8L

Device	Package	Marking	Packaging
GT045N10D5	DFN5*6-8L	GT045N10	2500pcs/Reel

Absolute Maximum Ratings $T_C = 25^\circ C$, 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}	150	A
Gate-Source Voltage	V_{GS}	± 20	V
Single Pulse Avalanche Energy (note2)	E_{AS}	121	mJ
Power Dissipation	P_D	85	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-Case	R_{thJc}	1.47	$^\circ C/W$

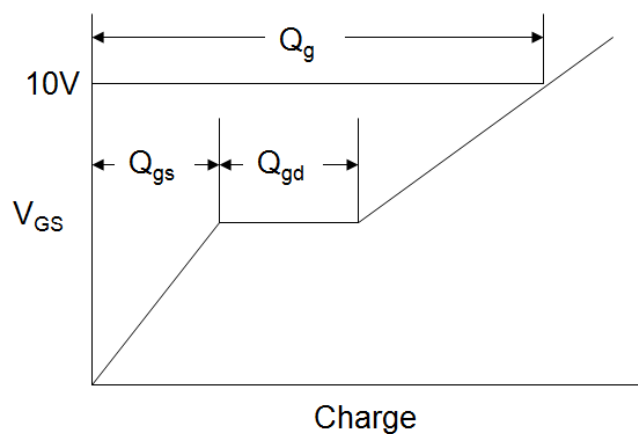
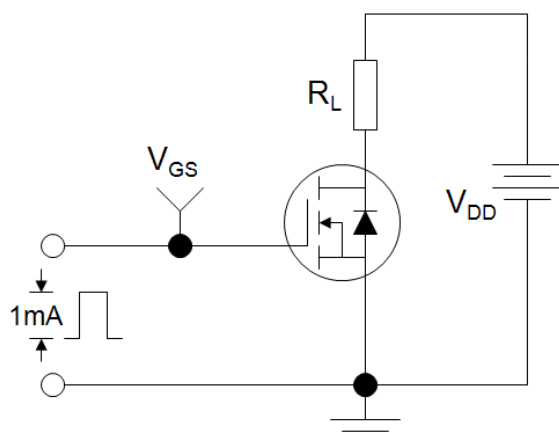
Specifications $T_J = 25^\circ\text{C}$, unless otherwise noted

Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static Parameters						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = 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	2	3	V
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} = 10V, I _D = 20A	--	4	4.5	mΩ
		V _{GS} = 4.5V, I _D = 20A	--	5.6	6.3	
Forward Transconductance	g _{FS}	V _{DS} =5V,I _D =20A	--	60	--	S
Dynamic Parameters						
Input Capacitance	C _{iSS}	V _{GS} = 0V, V _{DS} = 50V, f = 1.0MHz	--	3458	--	pF
Output Capacitance	C _{oSS}		--	589	--	
Reverse Transfer Capacitance	C _{rSS}		--	37	--	
Total Gate Charge	Q _g	V _{DD} = 50V, I _D = 20A, V _{GS} = 10V	--	75	--	nC
Gate-Source Charge	Q _{gs}		--	13	--	
Gate-Drain Charge	Q _{gd}		--	20	--	
Turn-on Delay Time	t _{d(on)}	V _{DD} = 50V, I _D = 20A, R _G = 4.5Ω	--	13	--	nS
Turn-on Rise Time	t _r		--	30	--	
Turn-off Delay Time	t _{d(off)}		--	61	--	
Turn-off Fall Time	t _f		--	41	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I _S	T _C = 25°C	--	--	80	A
Pulsed Diode Forward Current	I _{SM}		--	--	240	
Body Diode Voltage	V _{SD}	T _J = 25°C, I _{SD} = 20A, V _{GS} = 0V	--	--	1.3	V
Reverse Recovery Time	T _{rr}	I _S = 40A, V _{GS} = 0V di/dt=-100A/us	--	133.8	--	ns
Reverse Recovery Charge	Q _{rr}		--	257.6	--	nc

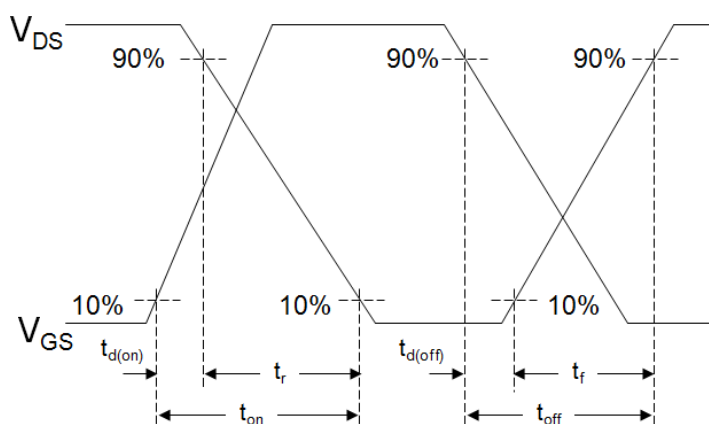
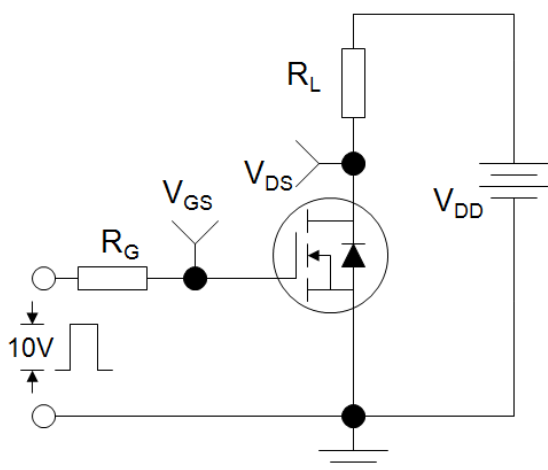
Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. $I_{AS} = 22A, V_{DD} = 50V, R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$
3. Identical low side and high side switch with identical R_G

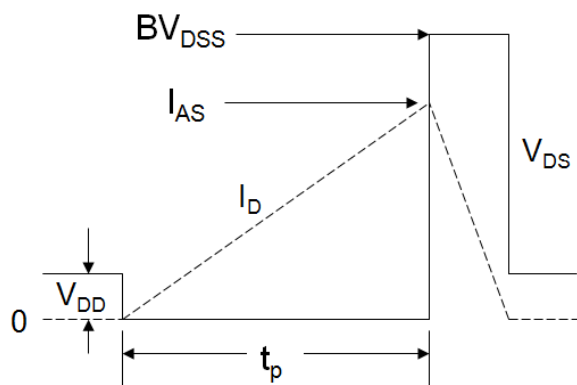
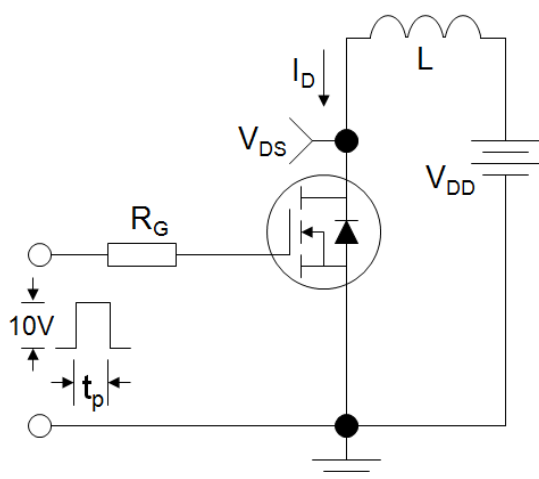
Gate Charge Test Circuit



Switch Time Test Circuit



EAS Test Circuit



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

Figure 1. Output Characteristics

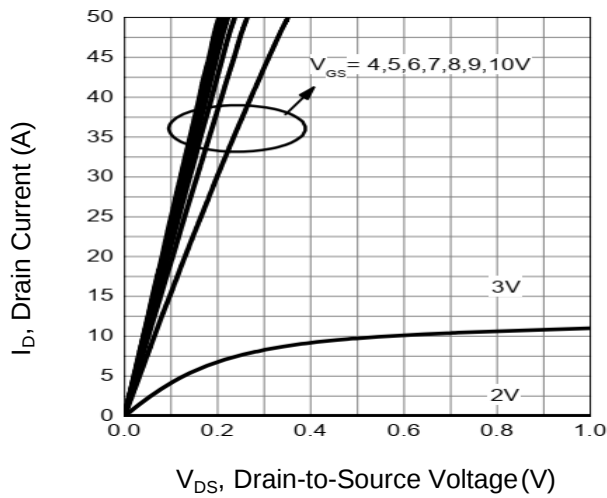


Figure 2. Transfer Characteristics

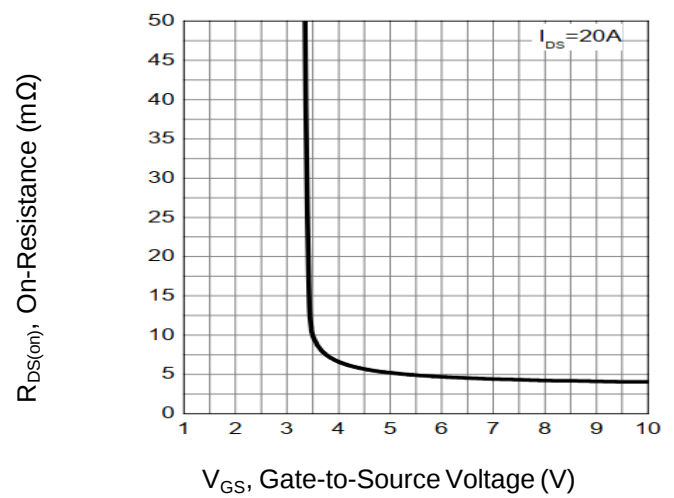


Figure 3. $R_{DS(on)}$ -Drain Current

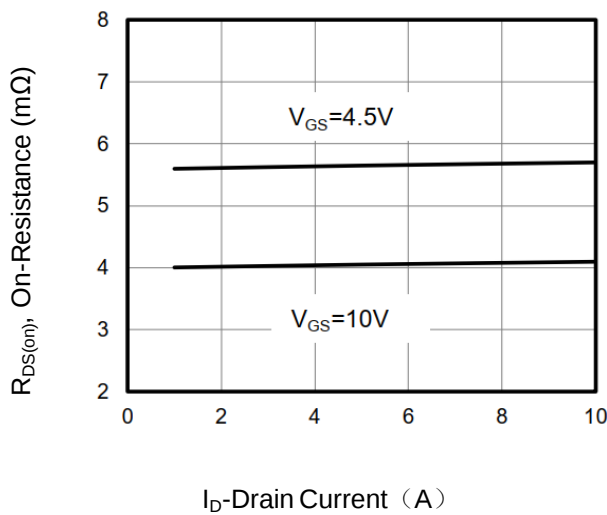


Figure 4. Gate Charge

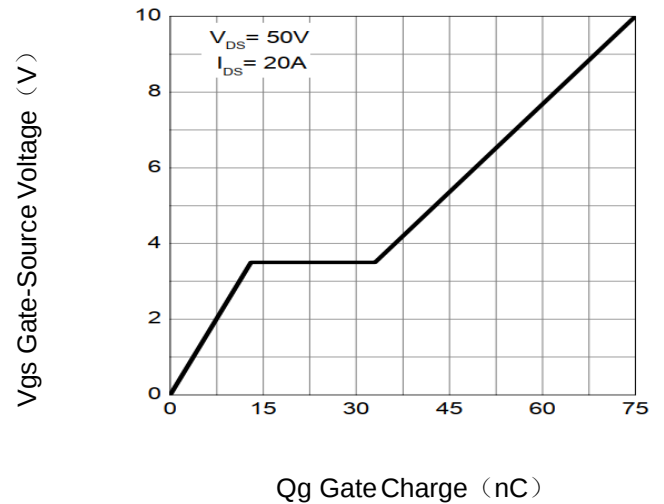


Figure 5. Capacitance vs V_{DS}

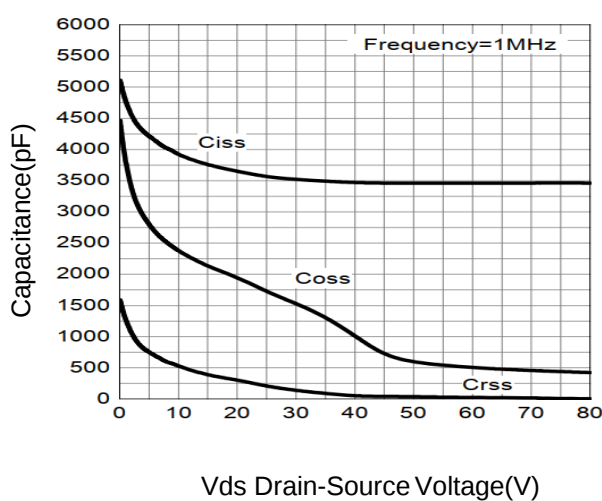
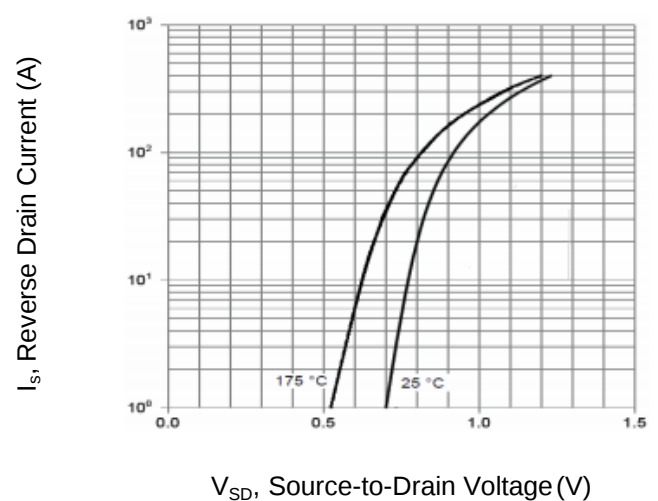


Figure 6. Source-Drain Diode Forward



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

Figure 7. Drain-Source On-Resistance

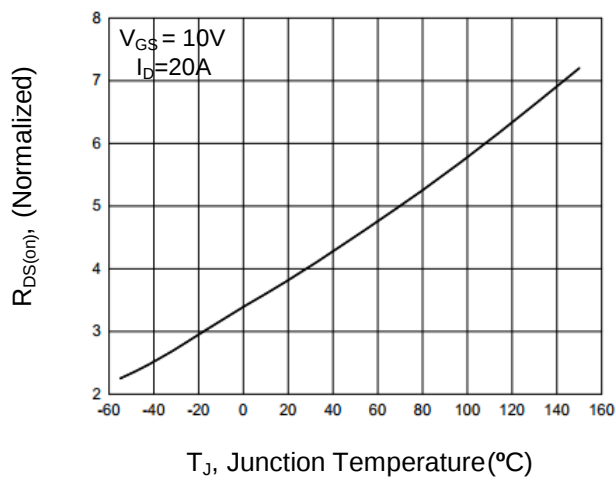


Figure 8. Safe Operation Area

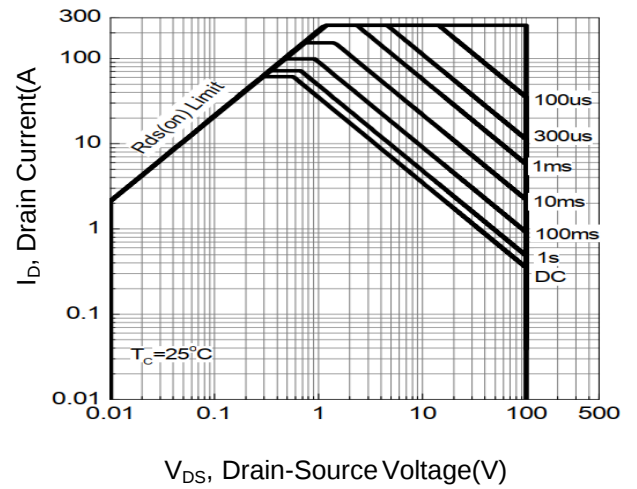
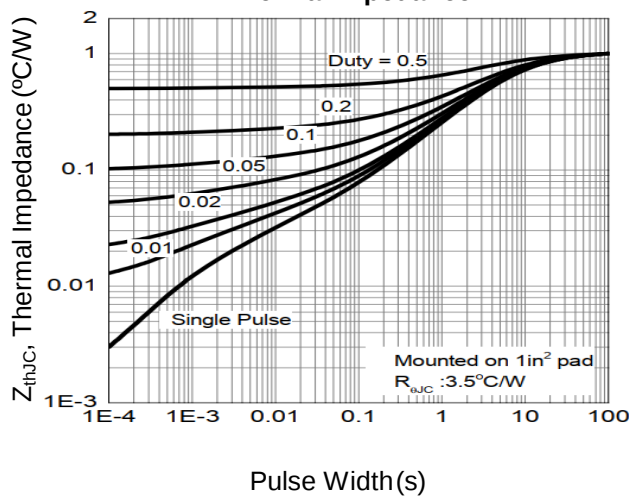
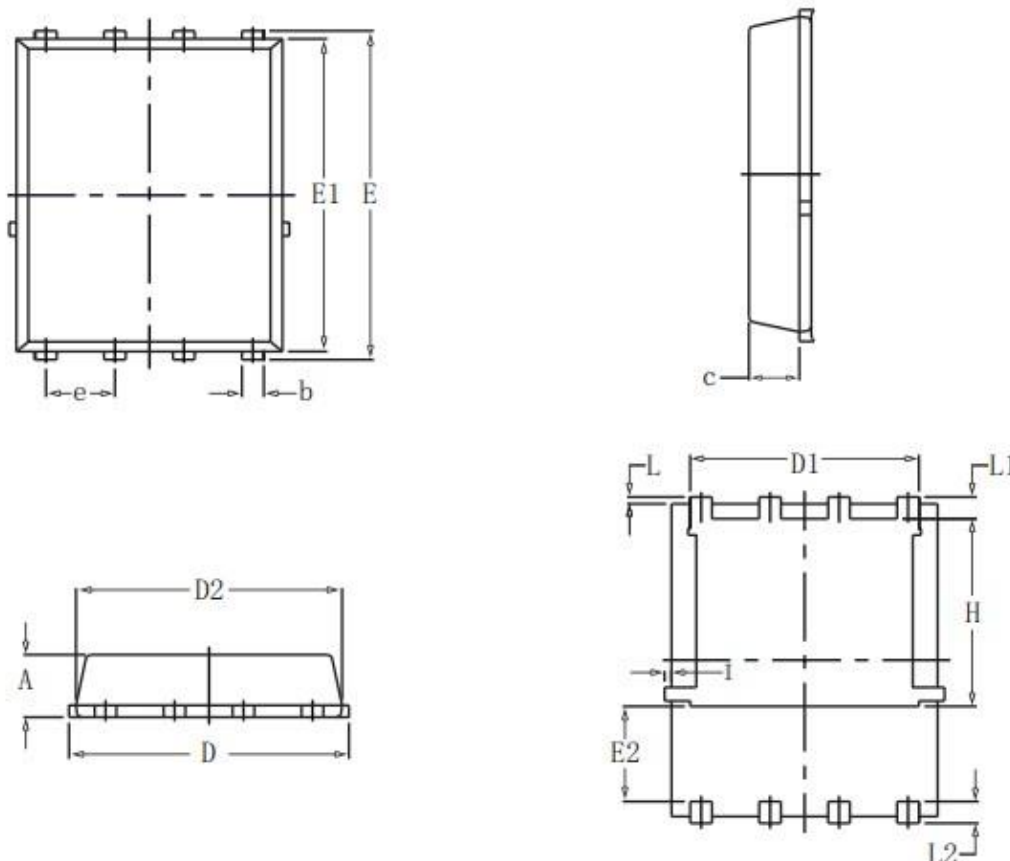


Figure 9. Normalized Maximum Transient Thermal Impedance



DFN5×6-8L Package Information



SYMBOL	COMMON			
	MM		INCH	
	MIN	MAX	MIN	MAX
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.970	0.0324	0.0382
D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.00	0.1890	0.1969
E	5.59	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.60	-	0.0630	-
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.0020	0.0098
L1	0.38	0.50	0.0150	0.0197
L2	0.38	0.50	0.0150	0.0197
H	3.30	3.50	0.1299	0.1378
I	-	0.18	-	0.0070