N-Channel Enhancement Mode Power MOSFET

Description

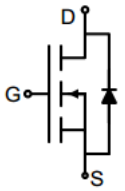
The GT12N06S uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. It can be used in a wide variety of applications.

General Features

- V_{DS} 60V
- I_D (at V_{GS} = 10V) 12A
- $R_{DS(ON)}$ (at V_{GS} = 10V) < 9mΩ
- $R_{DS(ON)}$ (at V_{GS} = 4.5V) < 13mΩ
- 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

SOP-8

Device	Package	Marking	Packaging
GT12N06S	SOP-8	GT12N06	4000pcs/Reel

Absolute Maximum Ratings T_C = 25ºC, unless otherwise noted

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	60	V
Continuous Drain Current	I_D	12	A
Pulsed Drain Current (note1)	I_{DM}	48	A
Gate-Source Voltage	V_{GS}	±20	V
Power Dissipation	P_D	3.1	W
Single pulse avalanche energy （note3）	E_{AS}	195	mJ
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 To 150	ºC

Thermal Resistance

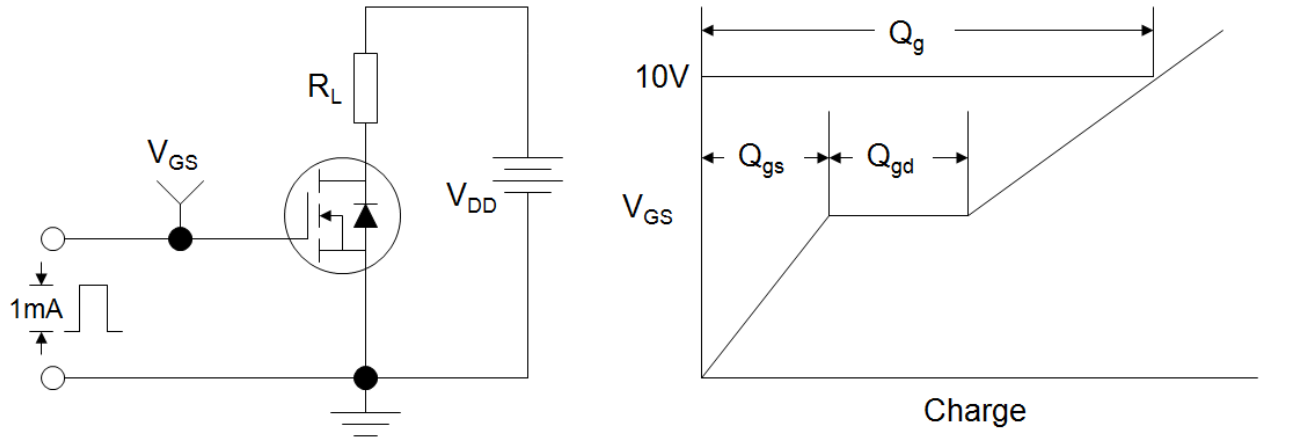
Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Ambient	R_{thJA}	40	ºC/W

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	60	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 60V, 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	1.7	2.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 12A	--	7.6	9.0	mΩ
		V_{GS} = 4.5V, I_D = 12A	--	10.5	13	
Forward Transconductance	g_{FS}	V_{DS}=5V,I_D=12A	30	--	--	S
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 30V, f = 1.0MHz	--	1988	--	pF
Output Capacitance	C_{oss}		--	470	--	
Reverse Transfer Capacitance	C_{rss}		--	14	--	
Total Gate Charge	Q_g	V_{DS} = 30V, I_D = 12A, V_{GS} = 10V	--	31	--	nC
Gate-Source Charge	Q_{gs}		--	6	--	
Gate-Drain Charge	Q_{gd}		--	5	--	
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 15V, I_D = 12A, R_G = 3Ω	--	10.5	--	ns
Turn-on Rise Time	t_r		--	4.5	--	
Turn-off Delay Time	$t_{d(off)}$		--	29.5	--	
Turn-off Fall Time	t_f		--	8	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	T_C = 25ºC	--	--	12	A
Body Diode Voltage	V_{SD}	T_J = 25ºC, I_{SD} = 12A, V_{GS} = 0V	--	--	1.2	V

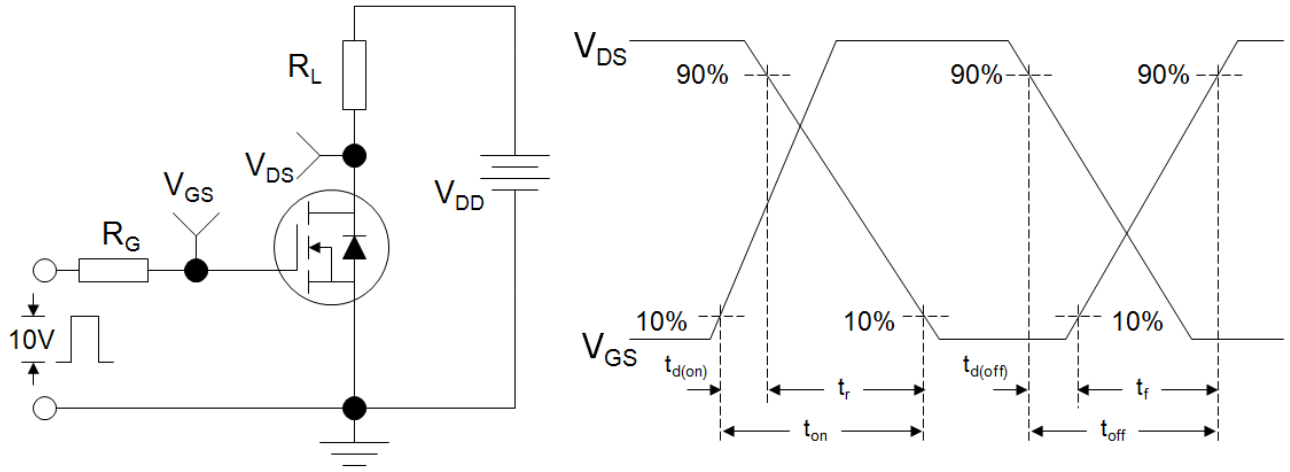
Notes

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 : Tj=25℃ ,VDD=50V,VGS=10V,L=0.5mH,Rg=25Ω

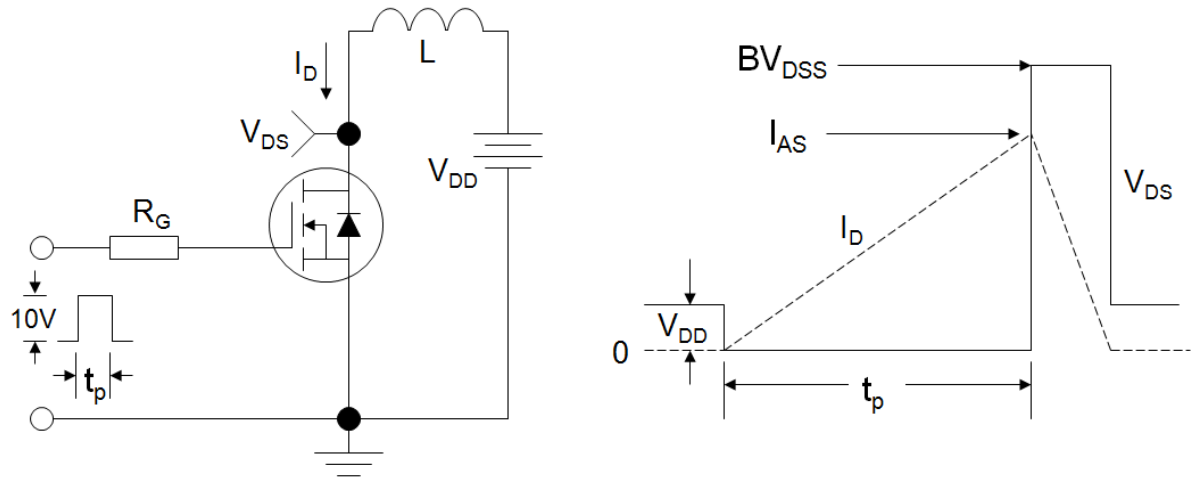
Gate Charge Test Circuit



EAS Test Circuit



Switch Time Test Circuit



Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 1. Output Characteristics

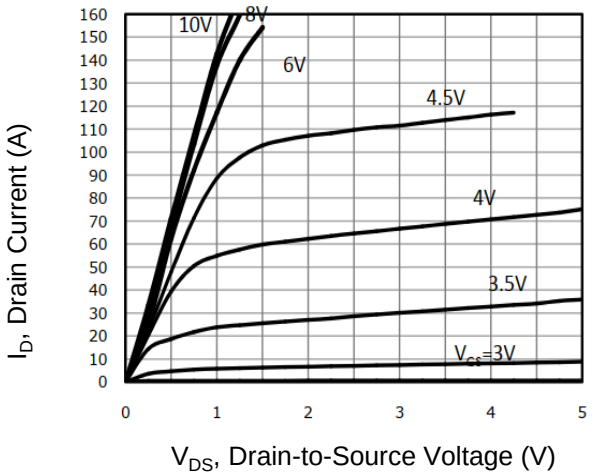


Figure 2. Transfer Characteristics

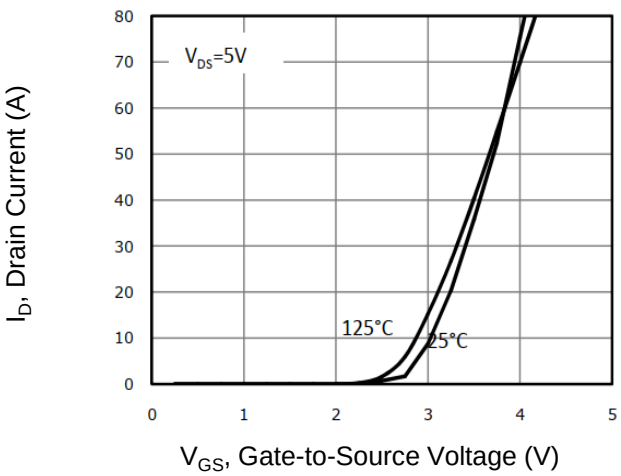


Figure 3. Gate Charge

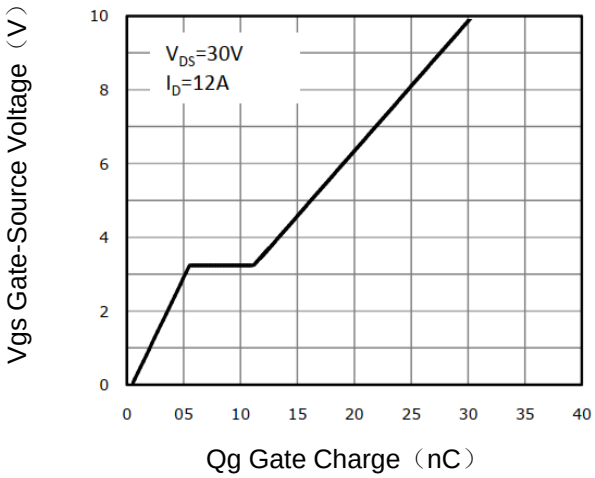


Figure 4. Drain Source On Resistance

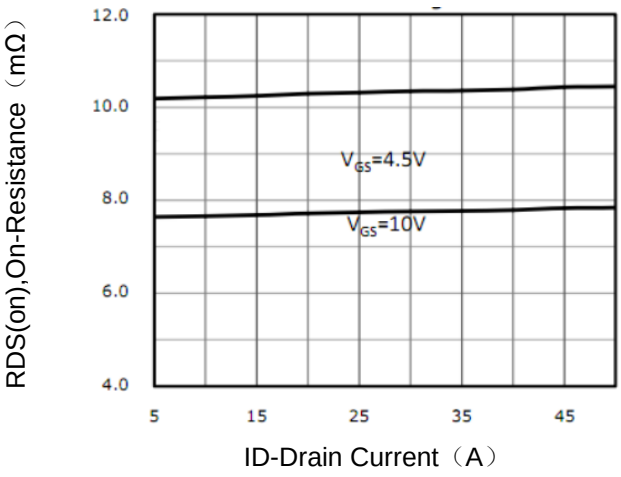


Figure 5. Capacitance vs Vds

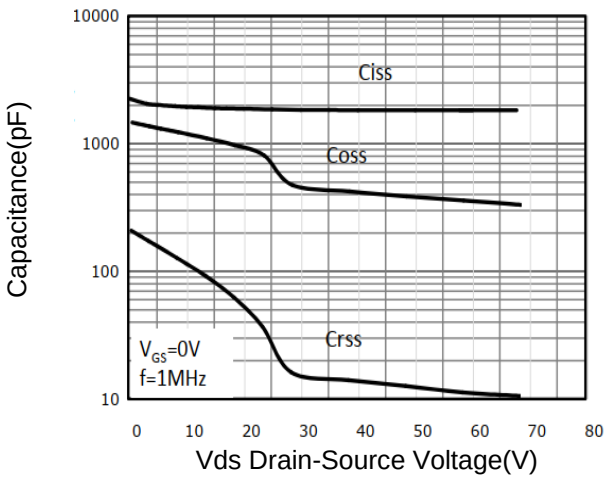
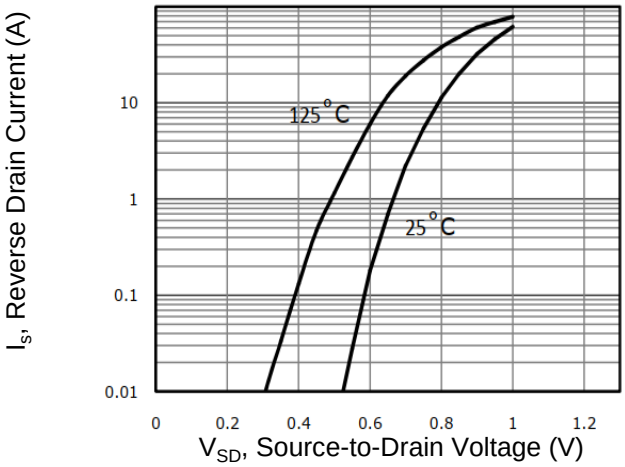


Figure 6. Source-Drain Diode Forward



Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 7. Drain-Source On-Resistance

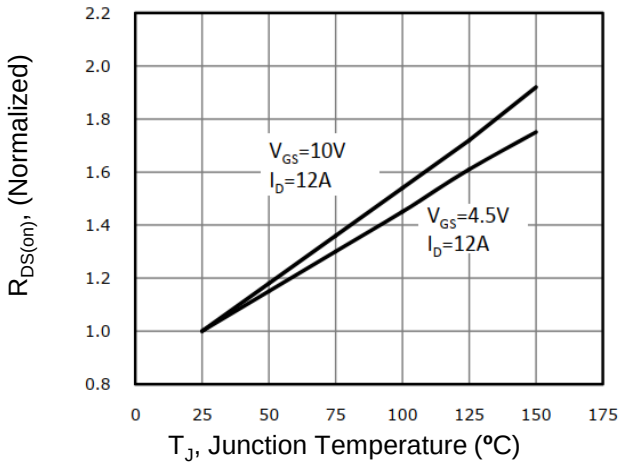


Figure 8. Safe Operation Area

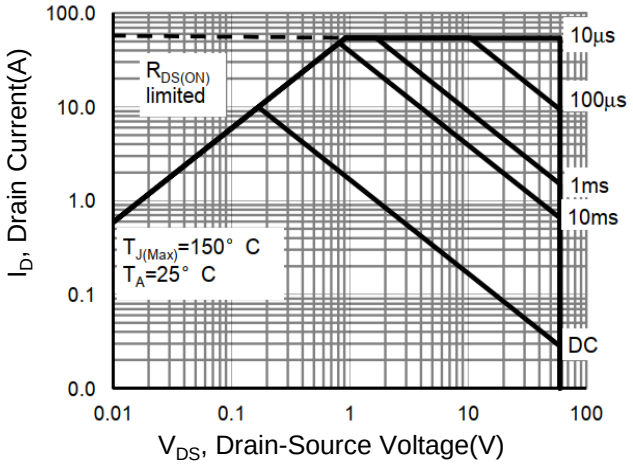
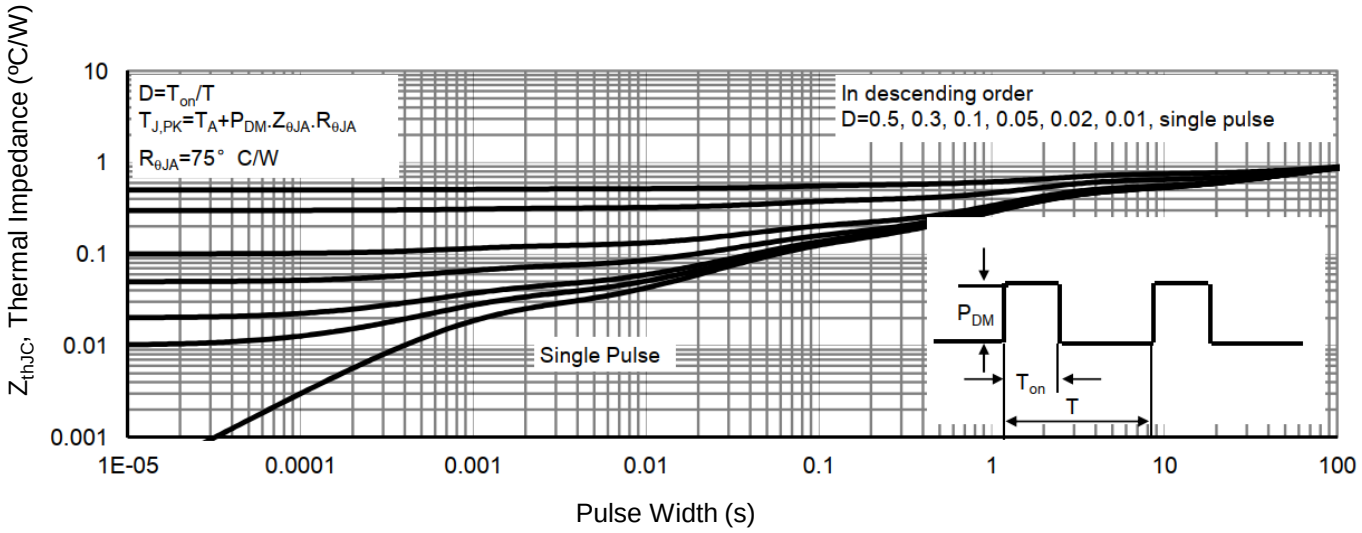
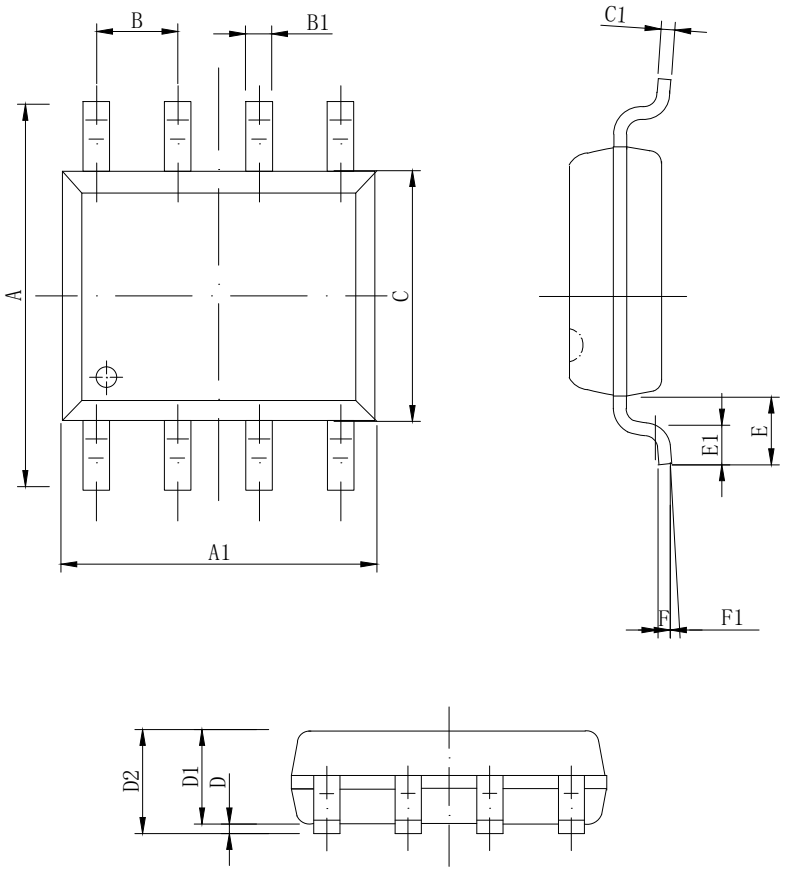


Figure 9. Normalized Maximum Transient Thermal Impedance



SOP-8 Package information



DIM	MIN	NOM	MAX
A	5.800	6.000	6.200
A1	4.800	4.900	5.000
B		1.270BSC	
B1	0.35 ° 8x	0.40 ° 8x	0.45 ° 8x
C	3.780	3.880	3.980
C1	-	0.203	0.253
D	0.050	0.150	0.250
D1	1.350	1.450	1.550
D2	1.500	1.600	1.700
E		1.060 REF	
E1	0.400	0.700	0.100
F		0.250BSC	
F1	2°	4°	6°

All Dimensions in mm