

N-Channel Enhancement Mode Power MOSFET

Description

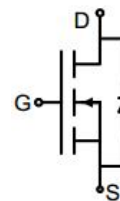
The GT090N06S uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. It can be used in a wide variety of applications.

General Features

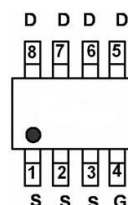
- V_{DS} 60V
- I_D (at $V_{GS} = 10V$) 14A
- $R_{DS(ON)}$ (at $V_{GS} = 10V$) < 8m Ω
- $R_{DS(ON)}$ (at $V_{GS} = 4.5V$) < 12.5m Ω
- 100% Avalanche Tested
- RoHS Compliant

Application

- Power switch
- DC/DC converters



Schematic diagram



pin assignment



SOP-8

Ordering Information

Device	Package	Marking	Packaging
GT090N06S	SOP-8	GT090N06S	4000pcs/Tube

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	60	V
Continuous Drain Current	I_D	14	A
Pulsed Drain Current (note1)	I_{DM}	56	A
Gate-Source Voltage	V_{GS}	± 20	V
Power Dissipation	P_D	3.1	W
Single pulse avalanche energy (note2)	E_{AS}	25	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-Ambient	R_{thJA}	40	$^\circ\text{C/W}$

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	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	1.6	2.4	V
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} = 10V, I _D = 8A	--	6.5	8	mΩ
		V _{GS} = 4.5V, I _D = 8A	--	8.5	12.5	
Forward Transconductance	g _{FS}	V _{GS} = 5V, I _D = 8A	--	28	--	S
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{GS} = 0V, V _{DS} = 30V, f = 1.0MHz	--	1378	--	pF
Output Capacitance	C _{oss}		--	385	--	
Reverse Transfer Capacitance	C _{rss}		--	7	--	
Total Gate Charge	Q _g	V _{DD} = 30V, I _D = 8A, V _{GS} = 10V	--	24	--	nC
Gate-Source Charge	Q _{gs}		--	7	--	
Gate-Drain Charge	Q _{gd}		--	2.5	--	
Turn-on Delay Time	t _{d(on)}	V _{DD} = 30V, I _D = 8A, R _G = 10Ω	--	6	--	ns
Turn-on Rise Time	t _r		--	3	--	
Turn-off Delay Time	t _{d(off)}		--	25	--	
Turn-off Fall Time	t _f		--	3	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I _S	T _C = 25°C	--	--	14	A
Body Diode Voltage	V _{SD}	T _J = 25°C, I _{SD} = 8A, V _{GS} = 0V	--	--	1.2	V
Reverse Recovery Charge	Q _{rr}	I _F = 8A, V _{GS} = 0V di/dt=300A/us	--	33	--	nC
Reverse Recovery Time	T _{rr}		--	25	--	ns

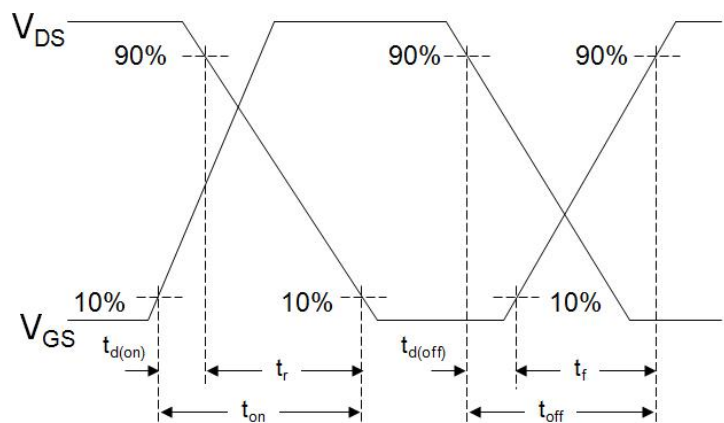
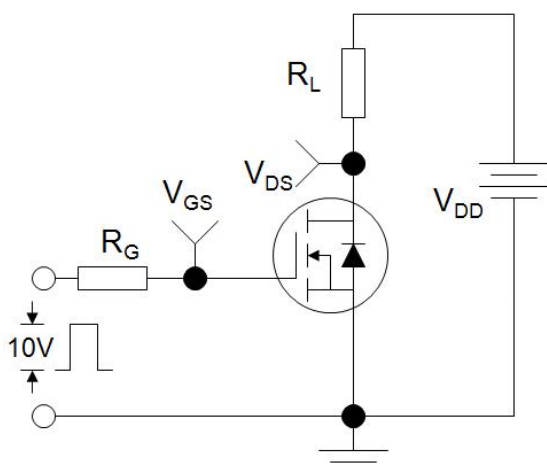
Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. EAS condition : $T_J = 25^\circ\text{C}$, $V_{DD} = 50V, V_{GS} = 10V, L = 0.5mH, R_g = 25\Omega$
3. Identical low side and high side switch with identical R_G

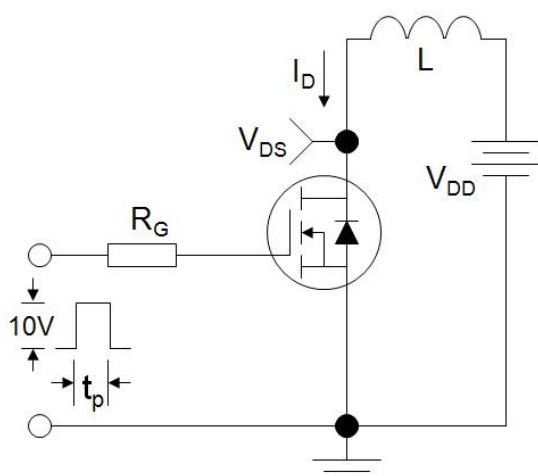
Gate Charge Test Circuit



Switch Time Test Circuit



EAS Test Circuit



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

Figure 1. Output Characteristics

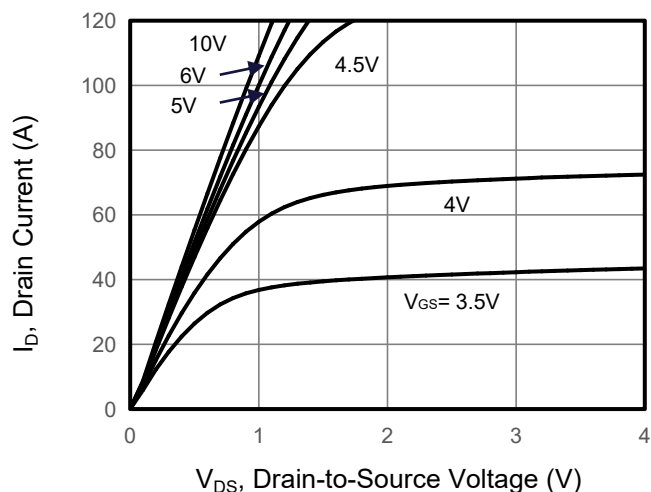


Figure 2. Transfer Characteristics

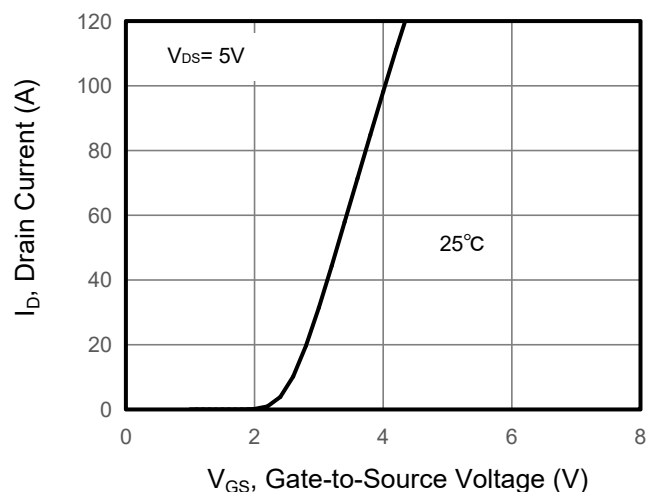


Figure 3. Drain Source On Resistance

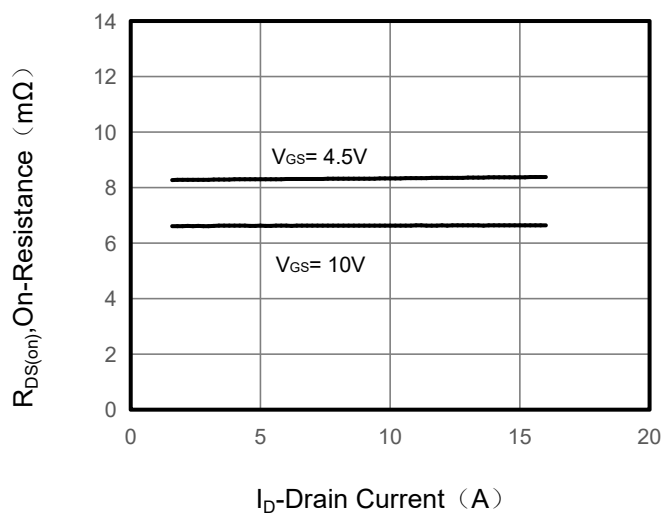


Figure 4. Gate Charge

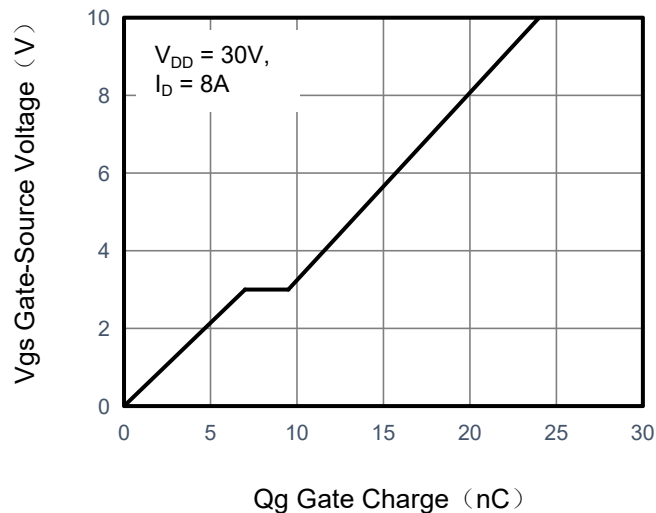


Figure 5. Capacitance

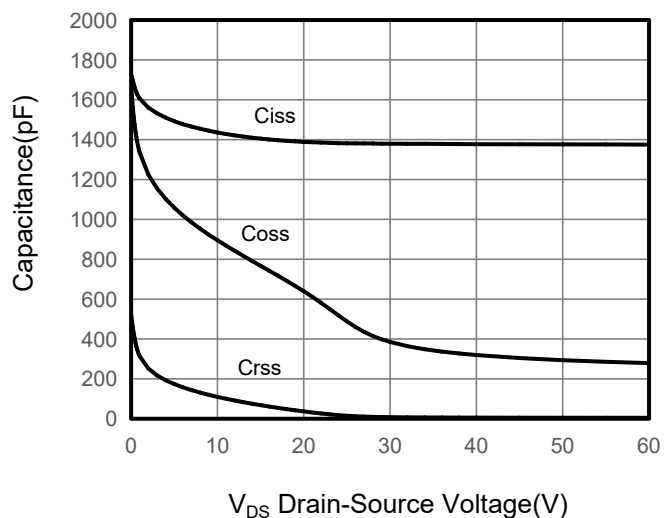
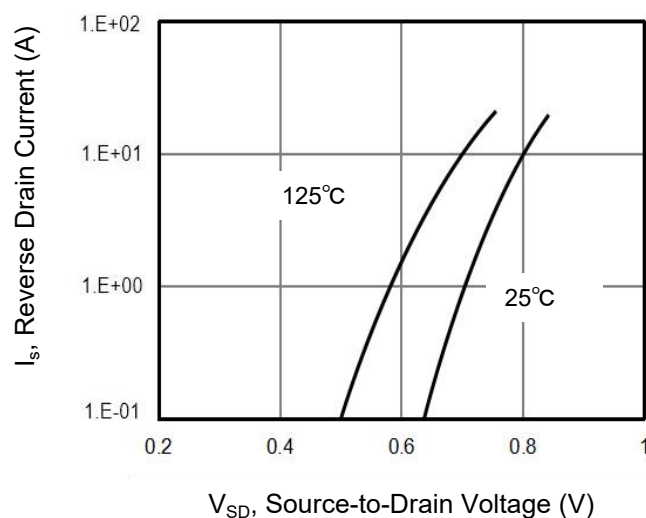


Figure 6. Source-Drain Diode Forward



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

Figure 7. Drain-Source On-Resistance

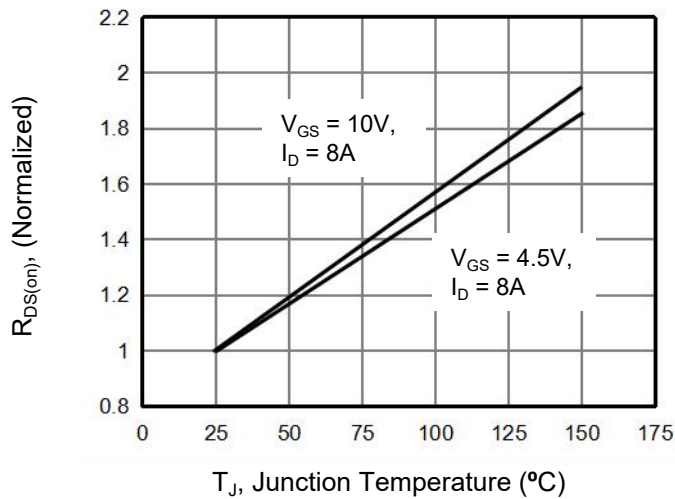


Figure 8. Safe Operation Area

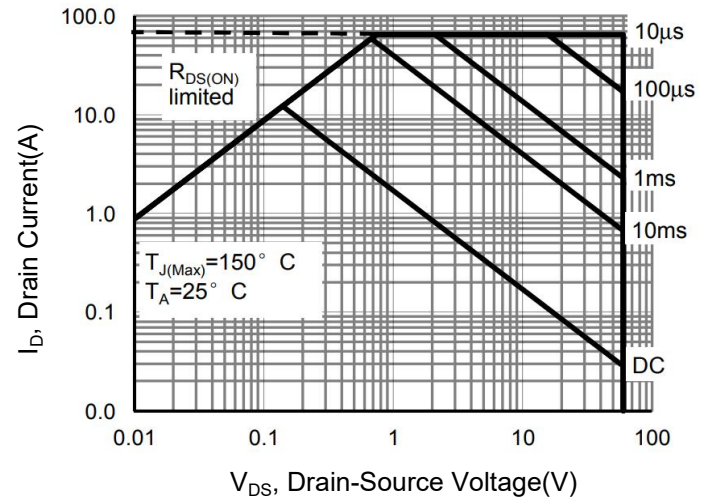
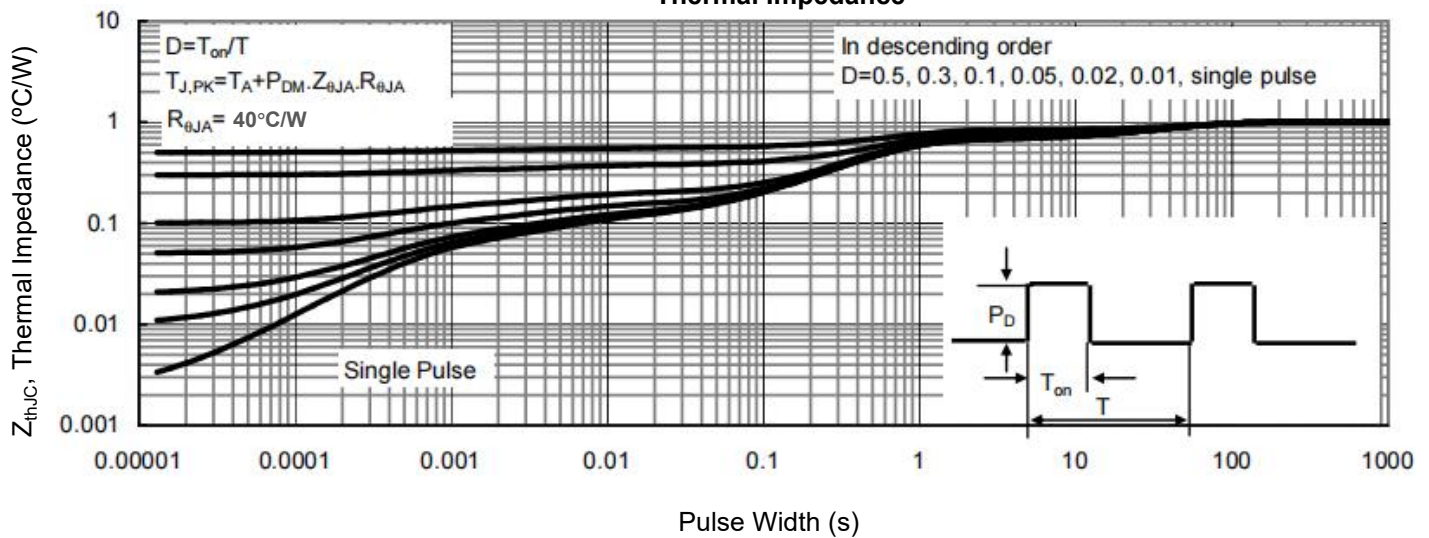
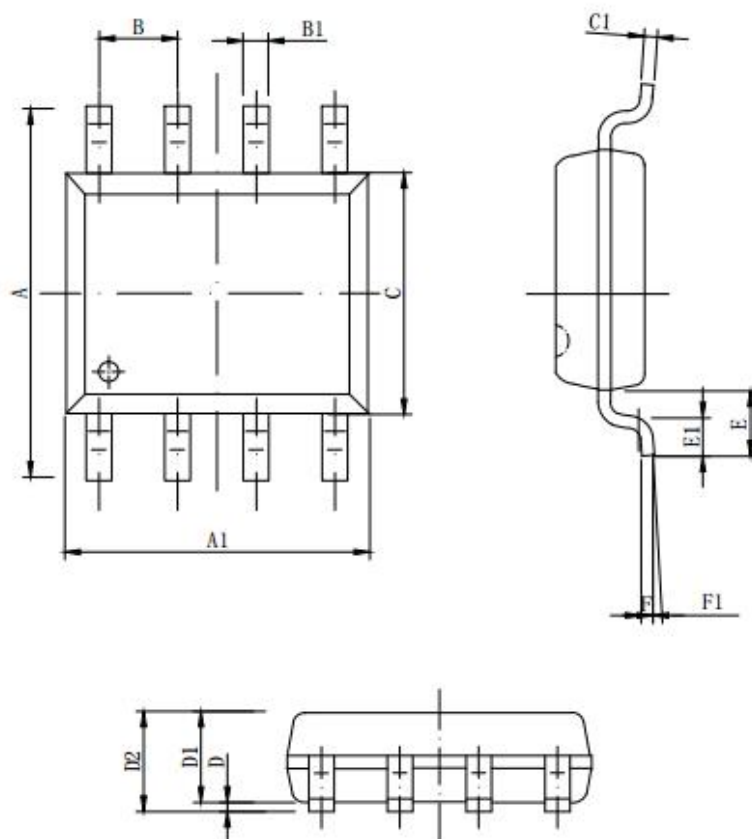


Figure 9. Normalized Maximum Transient Thermal Impedance



SOP-8 Package Information



Symbol	Dimensions in Millimeters		
	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
D2	1.500	1.600	1.700
E	1.060REF		
E1	0.400	0.700	0.100
F	0.250BSC		
F1	2°	4°	6°