P-Channel Trench MOSFET

Description

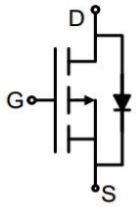
The G090P02S uses advanced trench technology toprovide excellent $R_{DS(ON)}$, low gate charge. It can be used in a wide variety of applications.

General Features

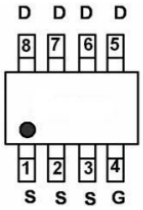
- V_{DS} -20V
- I_D (at V_{GS} = -10V) -11A
- $R_{DS(ON)}$ (at V_{GS} = -4.5V) < 9mΩ
- $R_{DS(ON)}$ (at V_{GS} = -2.5V) < 12.5mΩ
- 100% Avalanche Tested
- RoHS Compliant

Application

- Power switch
- DC/DC converters



Schematic diagram



pin assignment



SOP-8

Device	Package	Marking	Packaging
G090P02S	SOP-8	G090P02	4000pcs/Reel

Absolute Maximum Ratings T_C = 25ºC, unless otherwise noted

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-20	V
Continuous Drain Current	I_D	-11	A
Pulsed Drain Current (note1)	I_{DM}	-44	A
Gate-Source Voltage	V_{GS}	±12	V
Power Dissipation	P_D	3.3	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}	38	ºC/W

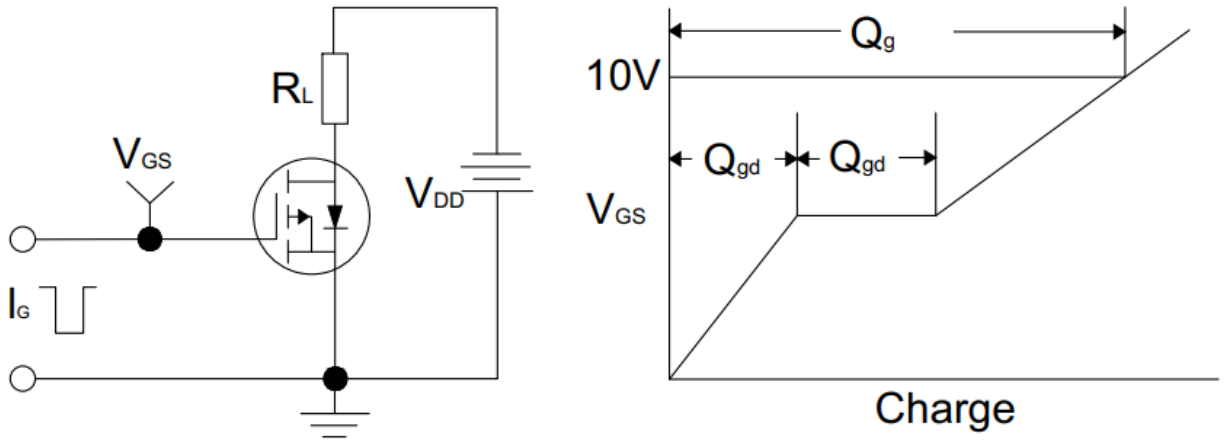
Specifications T_J = 25ºC, unless otherwise noted

Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static Parameters						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = -250μA	-20	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -20V, V_{GS} = 0V, T_J = 25ºC	--	--	-1	μA
Gate-Source Leakage	I_{GSS}	V_{GS} = ±12V	--	--	±100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250μA	-0.4	-0.65	-1.1	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = -4.5V, I_D = -1A	--	7.5	9.0	mΩ
		V_{GS} = -2.5V, I_D = -1A	--	10	12.5	
Forward Transconductance	g_{FS}	V_{DS}=-5V,I_D=-1A	--	90	--	S
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = -10V, f = 1.0MHz	--	2225	--	pF
Output Capacitance	C_{oss}		--	412	--	
Reverse Transfer Capacitance	C_{rss}		--	281	--	
Total Gate Charge	Q_g	V_{DD} = -10V, I_D = -1A, V_{GS} = -10V	--	47	--	nC
Gate-Source Charge	Q_{gs}		--	5	--	
Gate-Drain Charge	Q_{gd}		--	10	--	
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = -10V, I_D = -1A, R_G = 3Ω	--	3.5	--	ns
Turn-on Rise Time	t_r		--	6	--	
Turn-off Delay Time	$t_{d(off)}$		--	67	--	
Turn-off Fall Time	t_f		--	22	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	T_C = 25ºC	--	--	-11	A
Pulsed Diode Forward Current	I_{SM}		--	--	-44	
Body Diode Voltage	V_{SD}	T_J = 25ºC, I_{SD} = -1A, V_{GS} = 0V	--	--	1.2	V

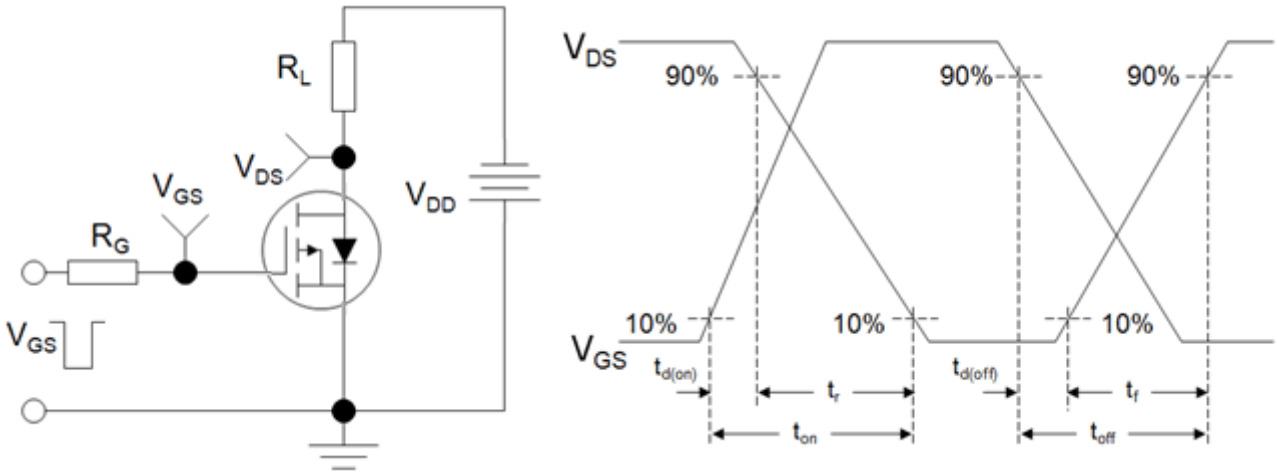
Notes

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

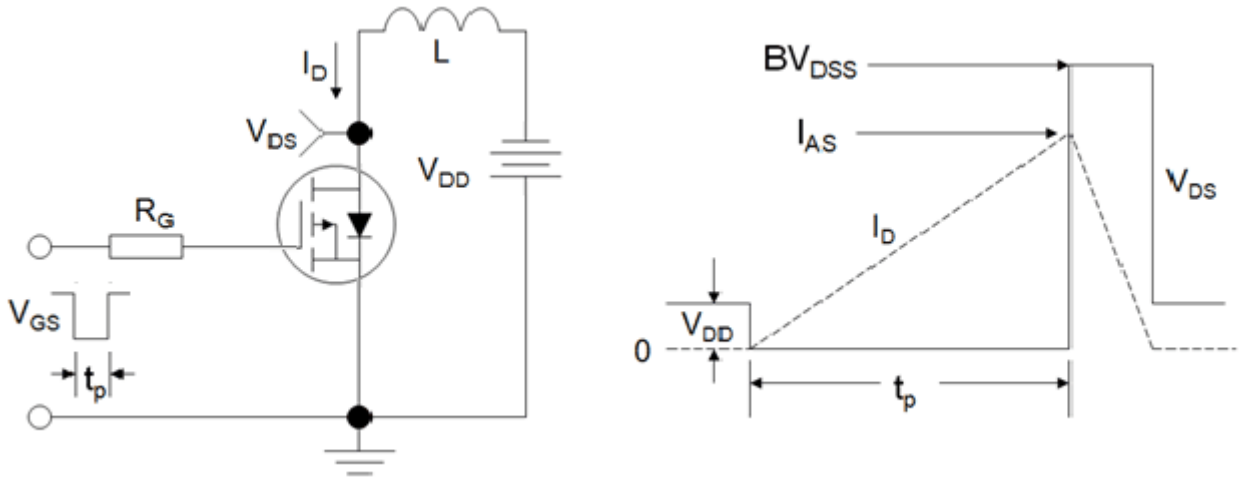
Gate Charge Test Circuit



Switch Time Test Circuit



EAS Test Circuit



Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 1. Output Characteristics

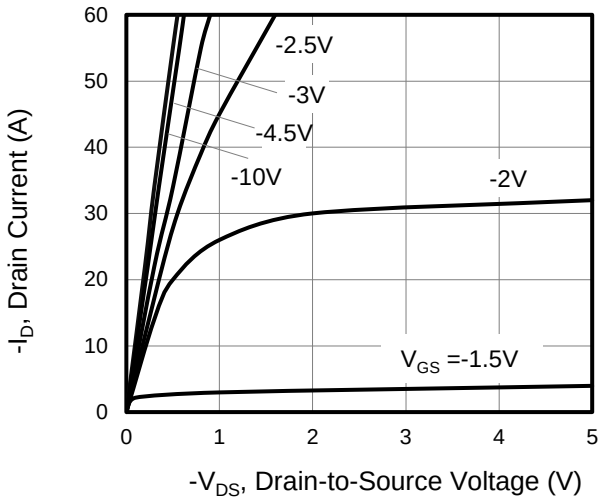


Figure 2. Transfer Characteristics

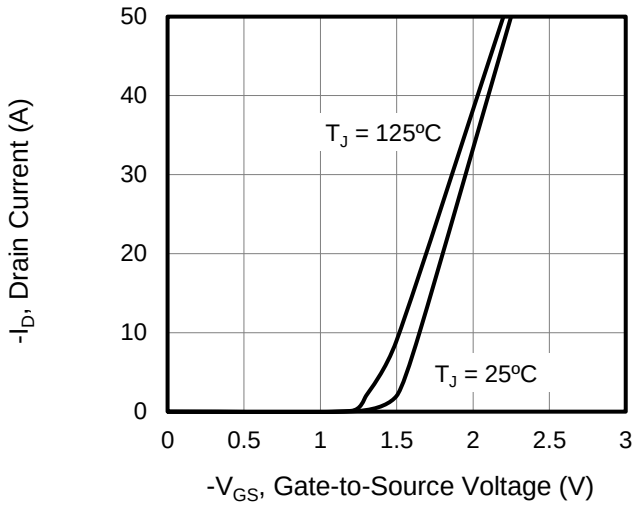


Figure 3. Rdson-Drain Current

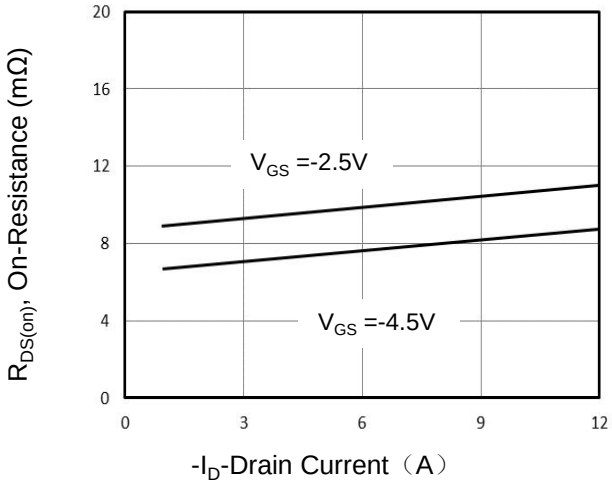


Figure 4. Gate Charge

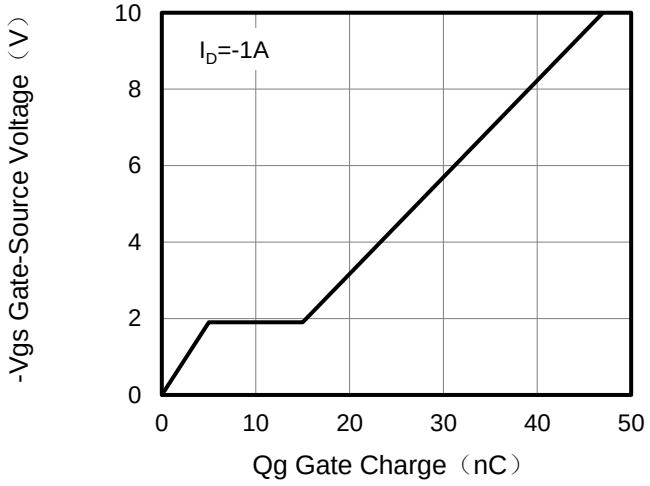


Figure 5. Capacitance vs Vds

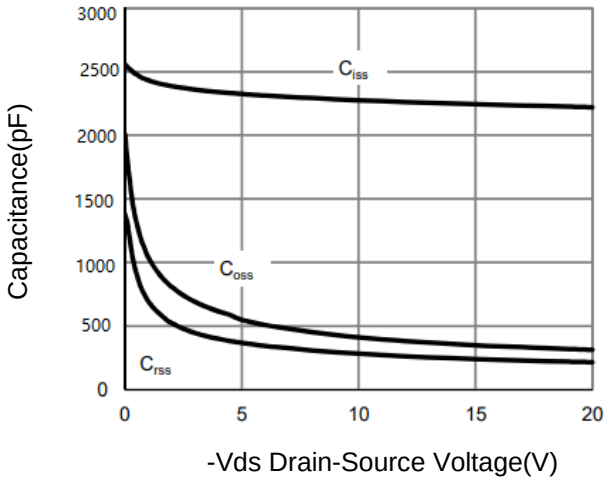
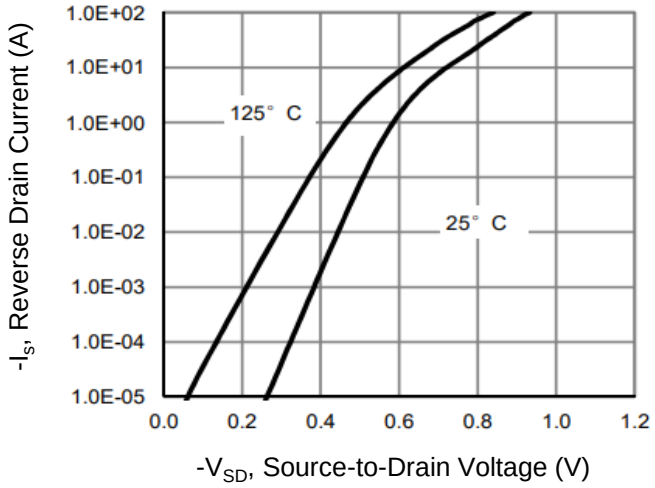


Figure 6. Source-Drain Diode Forward



Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 7. Drain-Source On-Resistance

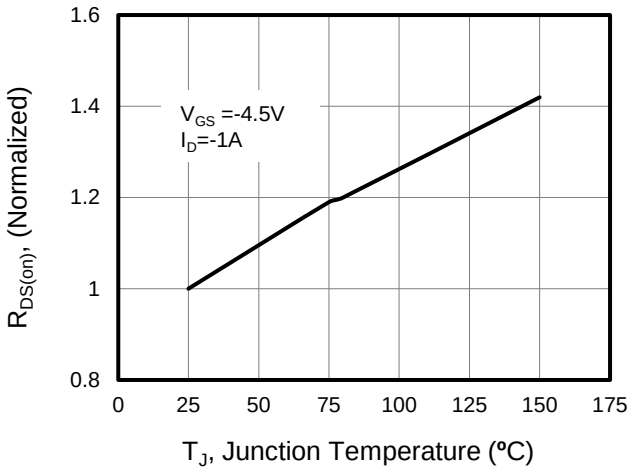
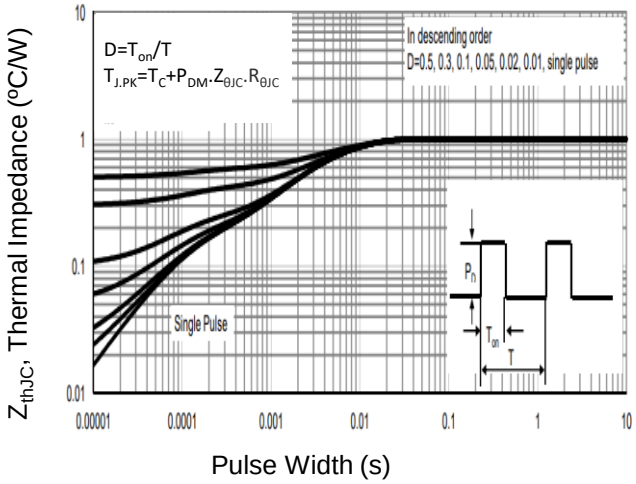
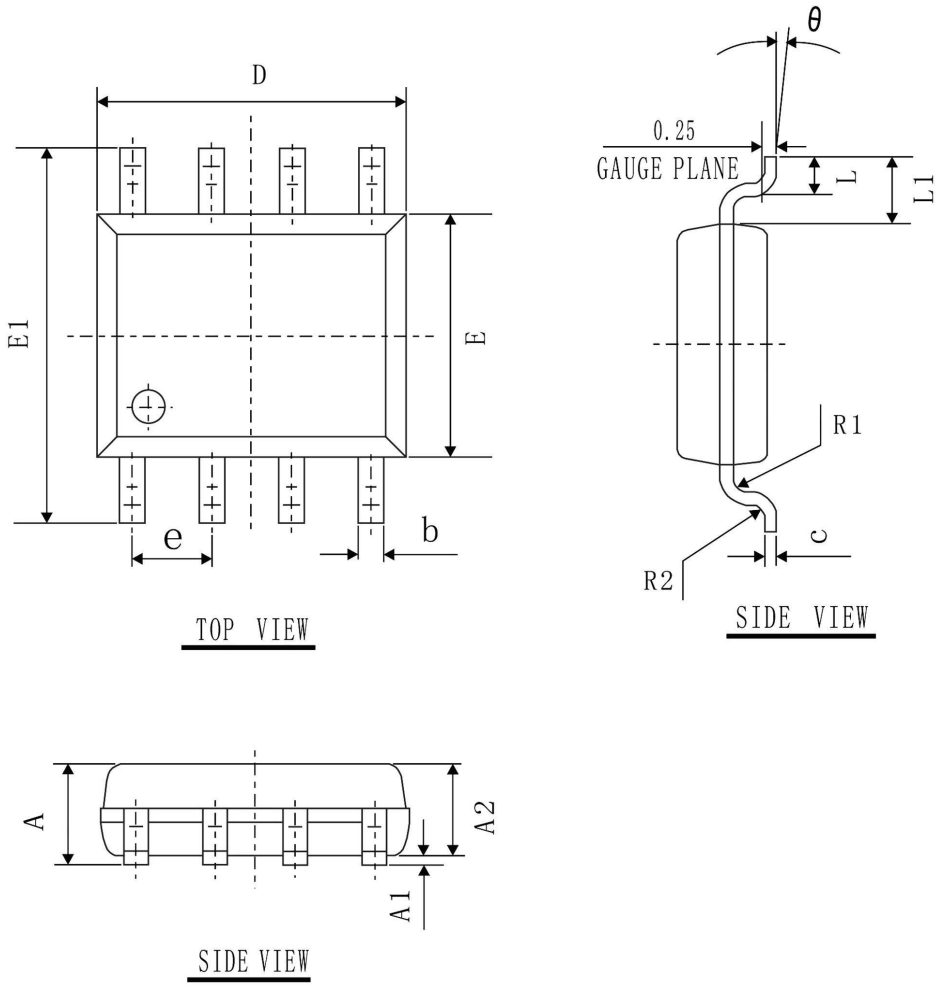


Figure 8. Normalized Maximum Transient Thermal Impedance



SOP-8 Package Information



COMMON DIMENSIONS
(UNITS OF MEASURE=mm)

SYMBOL	MIN	NOM	MAX
A	1.40	1.60	1.80
A1	0.05	0.15	0.25
A2	1.35	1.45	1.55
b	0.30	0.40	0.50
c	0.153	0.203	0.253
D	4.80	4.90	5.00
E	3.80	3.90	4.00
E1	5.80	6.00	6.20
L	0.45	0.70	1.00
θ	2°	4°	6°
L1	1.04 REF		
e	1.27 BSC		
R1	0.07 TYP		
R2	0.07 TYP		