P-Channel Trench Power MOSFET

General Description

The G18P03S uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as -5V. This device is suitable for use as a wide variety of applications.

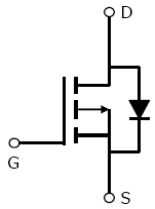
Features

V_{DSS}	$R_{DS(ON)}$ @-4.5V(Typ)	$R_{DS(ON)}$ @-10V(Typ)	I_D
-30V	10.5mΩ	8.1mΩ	-15A

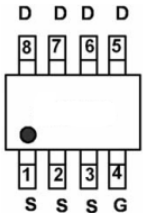
- High Power and current handing capability
- RoHS Compliant
- Surface Mount Package

Application

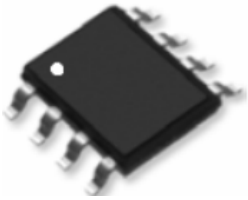
- DC-DC converter
- Load switch
- Power management



Schematic Diagram



Marking and pin assignment



SOP-8

Ordering Information

Part Number	Marking	Case	Packaging
G18P03S	G18P03	SOP-8	4000pcs/Reel

Table 1. Absolute Maximum Ratings (T_A=25℃)

Symbol	Parameter	Value	Unit
V_{DS}	Drain-Source Voltage (V_{GS}=0V)	-30	V
V_{GS}	Gate-Source Voltage (V_{DS}=0V)	±20	V
I_D	Drain Current-Continuous(T_C=25℃)	-15	A
$I_{DM\ (pluse)}$	Drain Current-Continuous@ Current-Pulsed **(Note 1)**	- 60	A
P_D	Maximum Power Dissipation(T_C=25℃)	3.1	W
T_J,T_{STG}	Operating Junction and Storage Temperature Range	-55 To 150	℃

Table 2. Thermal Characteristic

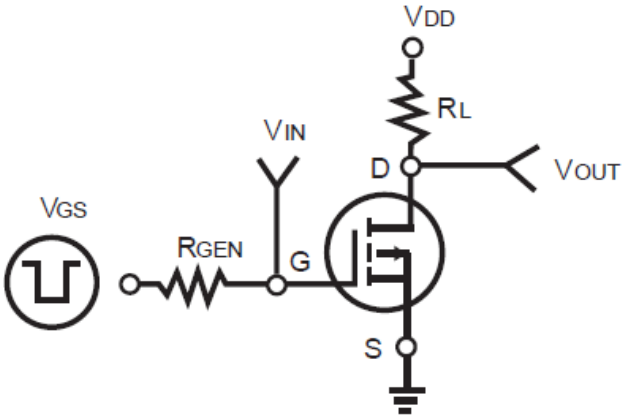
Symbol	Parameter	Typ	Max	Unit
$R_{\theta JC}$	Thermal Resistance,Junction-to-Case	--	40	℃/W

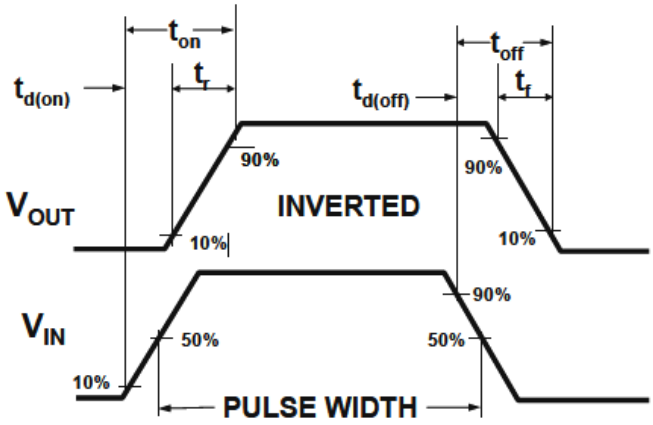
Table 3. Electrical Characteristics (TA=25℃unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V I_D=-250μA	-30			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-30V,V_{GS}=0V			-1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V,V_{DS}=0V			±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=-250μA	-1.1	-1.6	-2.5	V
g_{FS}	Forward Transconductance	V_{DS}=-5V,I_D=-10A		28		S
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=-10V, I_D=-10A		8.1	10	mΩ
		V_{GS}=-4.5V, I_D=-6 A		10.5	15	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=-15V,V_{GS}=0V, f=1.0MHz		3570		pF
C_{oss}	Output Capacitance			435		pF
C_{rss}	Reverse Transfer Capacitance			175		pF
Switching Times						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=-15V,I_D=-1A,R_L=15Ω V_{GS}=-10V,R_G=2.5Ω		16		nS
t_r	Turn-on Rise Time			14		nS
$t_{d(off)}$	Turn-Off Delay Time			50		nS
t_f	Turn-Off Fall Time			22		nS
Q_g	Total Gate Charge	V_{GS}=-10V, V_{DS}=-15V, I_D=-10A		58		nC
Q_{gs}	Gate-Source Charge			9		nC
Q_{gd}	Gate-Drain Charge			14		nC
Source-Drain Diode Characteristics						
I_S	Source-Drain Current(Body Diode)				-15	A
V_{SD}	Forward on Voltage	V_{GS}=0V,I_S=-10A			-1.2	V

Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature

Switch Time Test Circuit and Switching Waveforms：





TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS (Curves)

Figure1. Power Dissipation

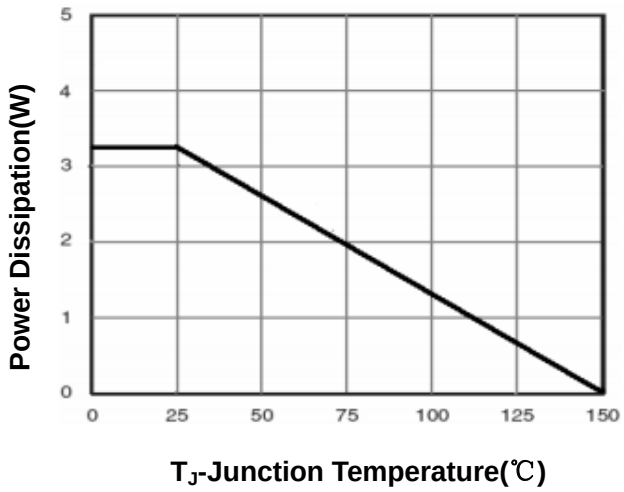


Figure2. Transfer Characteristics

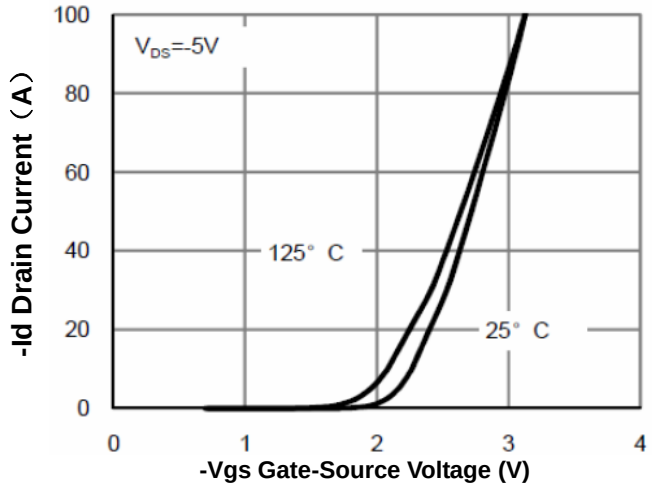


Figure3. Output Characteristics

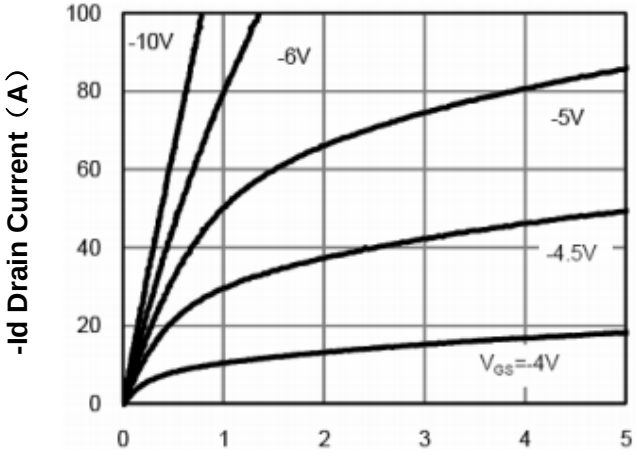


Figure 4.Rdson Drain Current

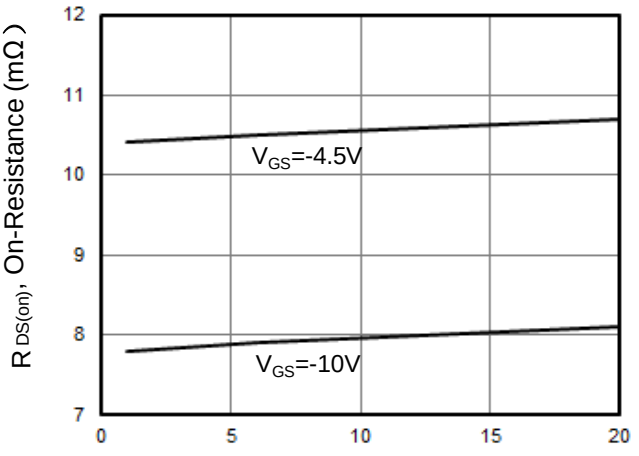


Figure5. Capacitance

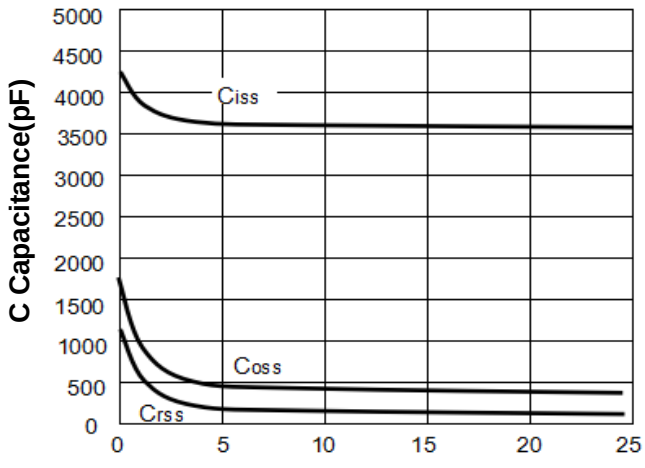


Figure6. $R_{DS(ON)}$ vs Junction Temperature

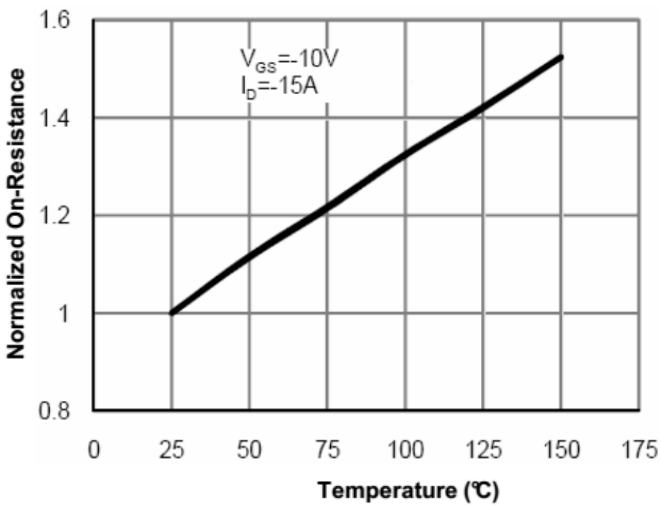


Figure7. Gate Charge Waveforms

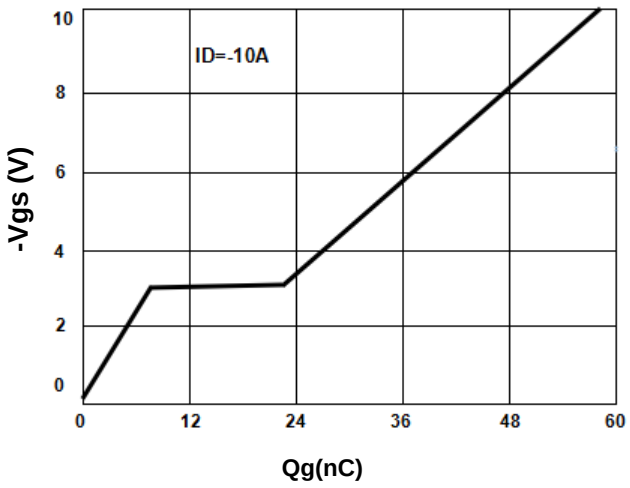


Figure8. Maximum Safe Operating Area

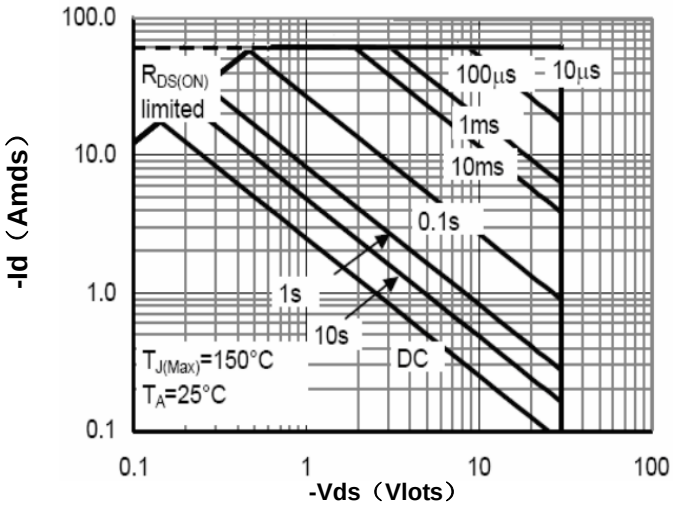
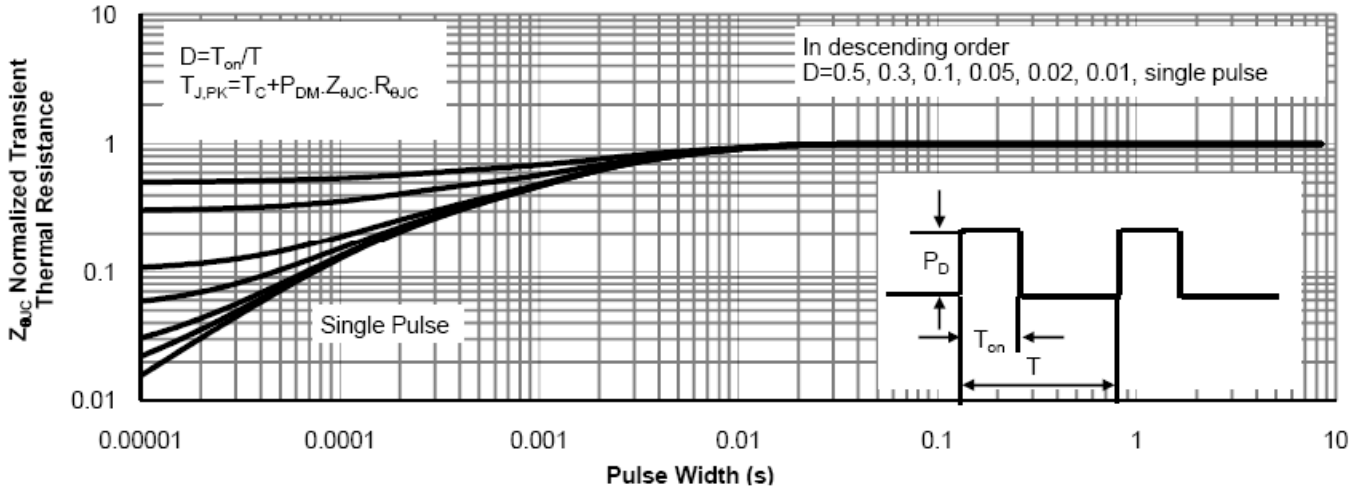
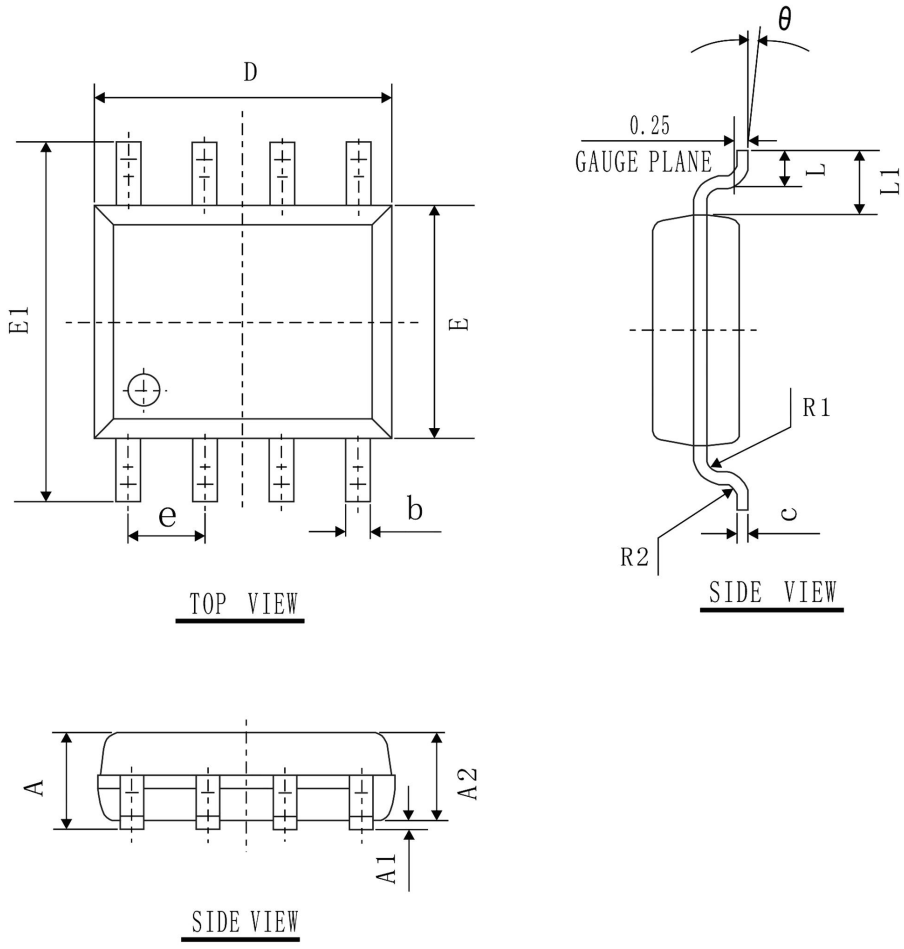


Figure9. Normalized Maximum Transient Thermal Impedance



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		