GLP4015AS

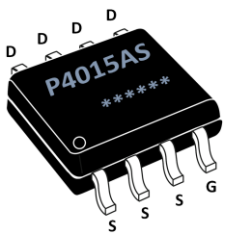
GL Silicon P-Channel Power MOSFET

General Description:

The GLP4015AS uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications. The package form is SOP-8, which accords with the RoHS standard.

V_{DSS}	-40	V
I_D	-13	A
P_D	3.0	W
$R_{DS(ON)type}$	11	mΩ

SOP-8



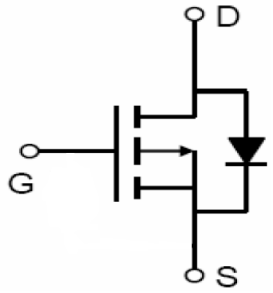
Features:

- $R_{DS(ON)}$ <15mΩ @ V_{GS}=10V (Typ11mΩ)
- High density cell design for ultra low R_{dson}
- Fully characterized avalanche voltage and current
- Excellent package for good heat dissipation

Applications:

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

Inner Equivalent Principium Chart



Absolute (Tc= 25℃ unless otherwise specified):

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	-40	V
I_D	Continuous Drain Current	-13	A
	Continuous Drain Current T_C = 70 °C	-10	A
I_{DM} [a1]	Pulsed Drain Current	-50	A
V_{GS}	Gate-to-Source Voltage	±20	V
Eas [a5]	L=0.5mH	130	mJ
dv/dt [a3]	Peak Diode Recovery dv/dt	5.0	V/ns
P_D	Power Dissipation	3.0	W
T_J, T_{stg}	Operating Junction and Storage Temperature Range	150, –55 to 150	℃
T_L	MaximumTemperature for Soldering	300	℃

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Electrical Characteristics (Tc= 25℃ unless otherwise specified):

OFF Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
V_{DSS}	Drain to Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	-40	--	--	V
I_{DSS}	Drain to Source Leakage Current	V_{DS}=-40V, V_{GS}= 0V,T_a=25℃	--	--	1.0	μA
$I_{GSS(F)}$	Gate to Source Forward Leakage	V_{GS}=+20V	--	--	0.1	μA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	V_{GS}=-20V	--	--	-0.1	μA

ON Characteristics[a3]						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$R_{DS(ON)}$	Drain-to-Source On-Resistance	V_{GS}=-10V,I_D=-14A	--	11	15	mΩ
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	-1	--	-3.0	V
Pulse width tp≤380μs,δ≤2%						

Dynamic Characteristics[a4]						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
g_{fs}	Forward Transconductance	V_{DS}=-15V,I_D=-12A	25	--	--	S
C_{iss}	Input Capacitance	V_{GS}=0V,V_{DS}=-20V f=1.0MHz	--	2900	--	pF
C_{oss}	Output Capacitance		--	350	--	
C_{rss}	Reverse Transfer Capacitance		--	300	--	

Resistive Switching Characteristics[a4]						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=-20V,I_D=-12A V_{GS}=-10V,R_G=3Ω	--	10	--	ns
tr	Rise Time		--	17	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	36	--	
t_f	Fall Time		--	38	--	
Q_g	Total Gate Charge	V_{DD}=-20V, I_D=-12A V_{GS}=-10V	--	65	--	nC
Q_{gs}	Gate to Source Charge		--	14	--	
Q_{gd}	Gate to Drain (“Miller”)Charge		--	27	--	

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Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_S	Continuous Source Current [a2](Body Diode)		--	--	-13	A
V_{SD}	Diode Forward Voltage[a3]	I_S=-13A,V_{GS}=0V	--	--	-1.5	V
trr	Reverse Recovery Time	I_S=-13A,T_j = 25° C dI_F/dt=100A/us, V_{GS}=0V	--	35	--	ns
Qrr	Reverse Recovery Charge		--	30	--	nC

Symbol	Parameter	Typ.	Units
$R_{\theta JC}$	Junction-to-Case[a2]	41.7	℃/W

[a1]: Repetitive Rating: Pulse width limited by maximum junction temperature.

[a2]: Surface Mounted on FR4 Board, t≤10sec.

[a3]: Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%.

[a4]: Guaranteed by design, not subject to production

[a5]: T_J=25℃, V_{DD}=-15V, V_G=-10V,L=0.5Mh

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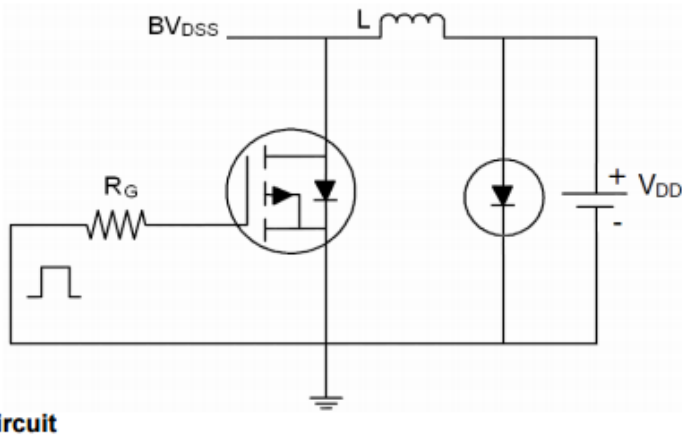
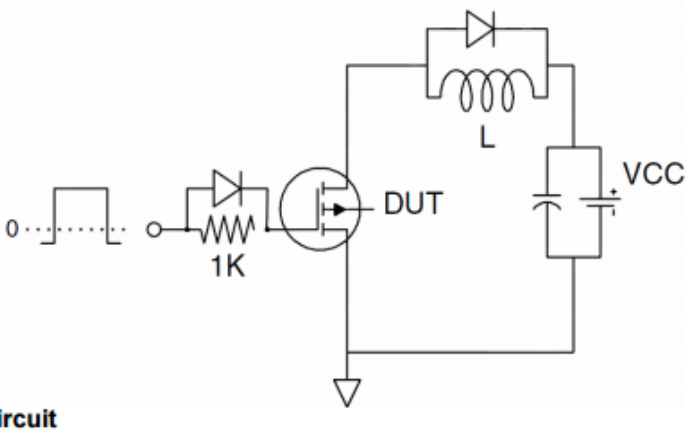
Test Circuit

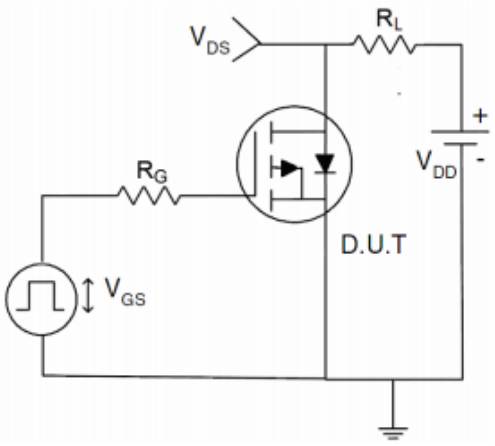
1) E_{AS} Test Circuit



2) Gate Charge Test Circuit



3) Switch Time Test Circuit



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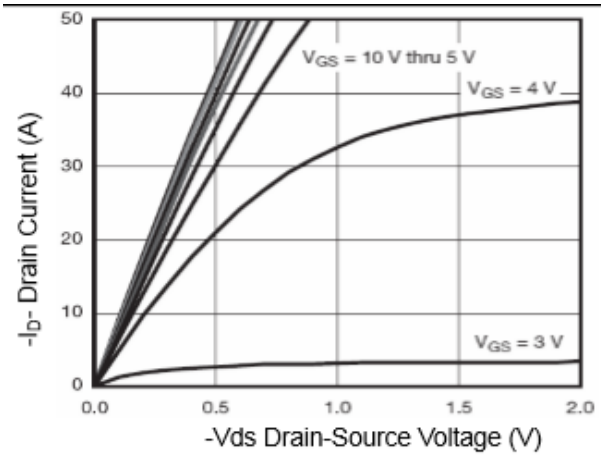

Figure 1 Output Characteristics

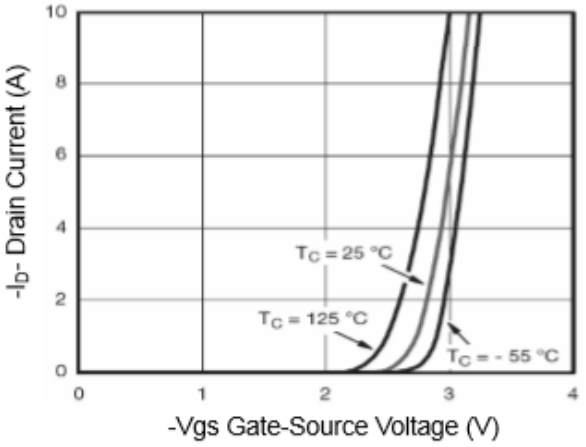

Figure 2 Transfer Characteristics

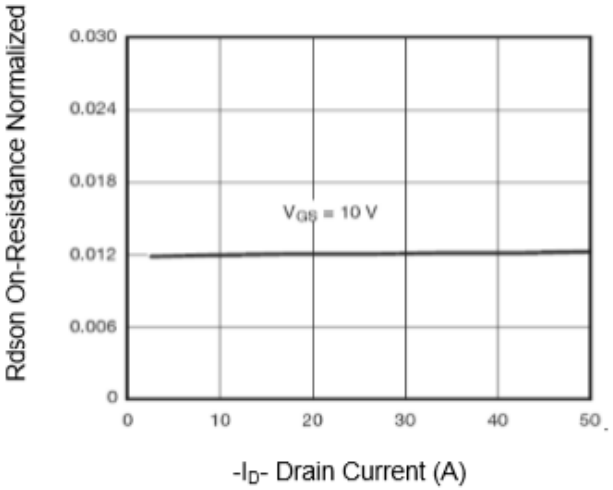

Figure 3 Rdson- Drain Current

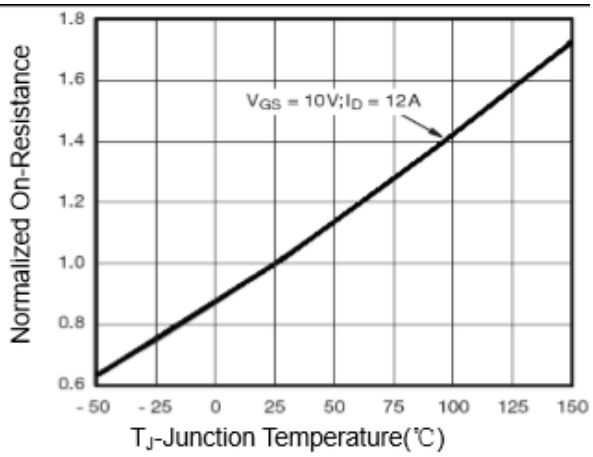

Figure 4 Rdson-Junction Temperature

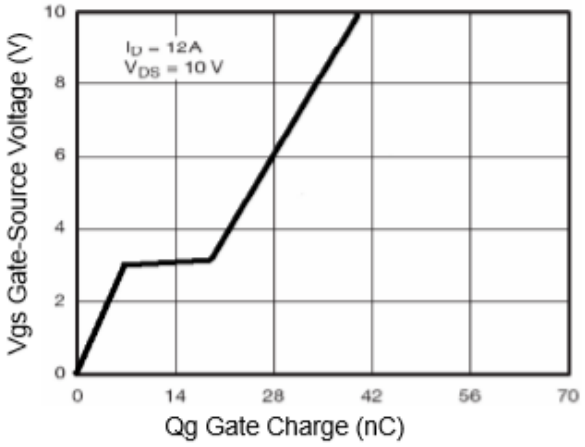

Figure 5 Gate Charge

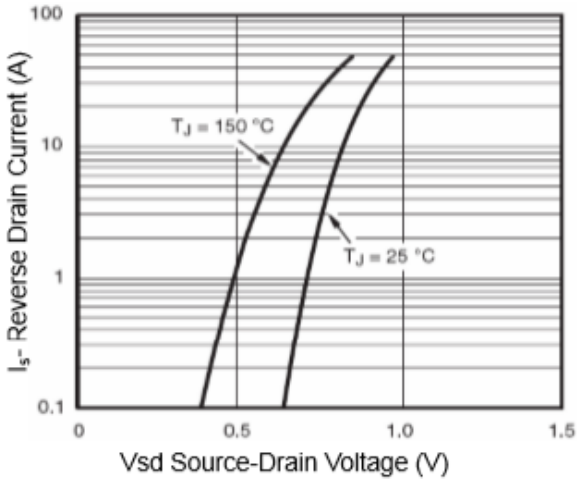

Figure 6 Source- Drain Diode Forward

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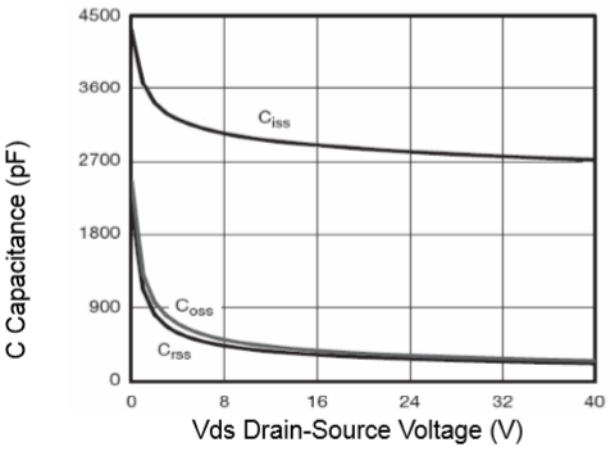

Figure 7 Capacitance vs Vds

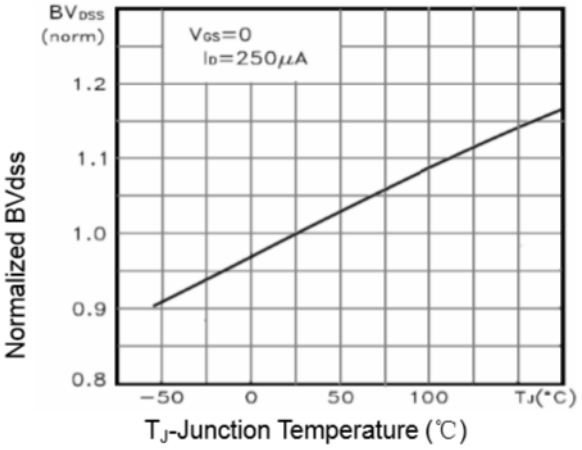

Figure 9 BV_{DSS} vs Junction Temperature

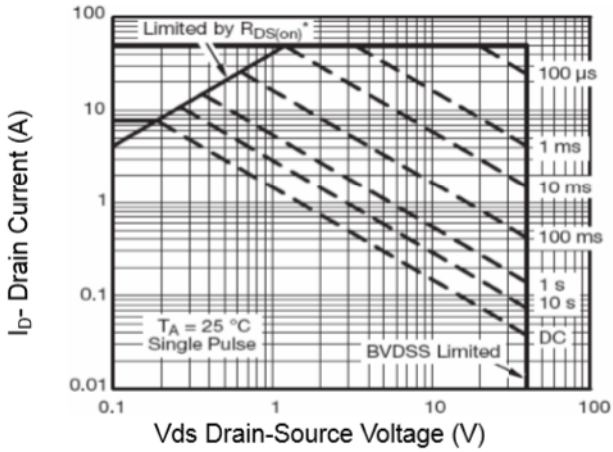

Figure 8 Safe Operation Area

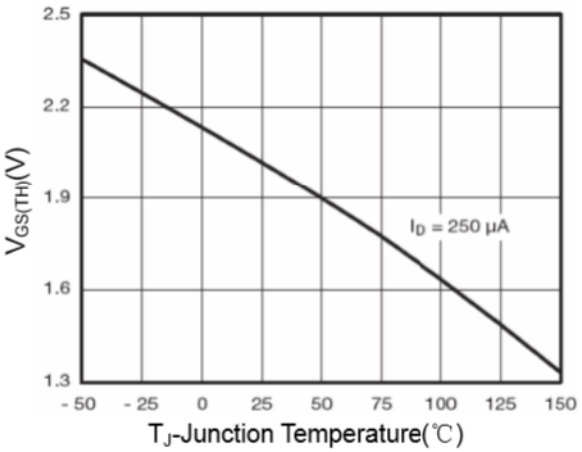

Figure 10 $V_{GS(th)}$ vs Junction Temperature

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