

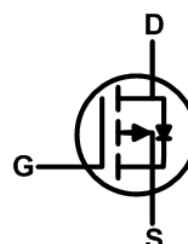
P-Ch 60V Fast Switching MOSFETs

Features:

- ★ Super Low Gate Charge
- ★ 100% EAS Guaranteed
- ★ Green Device Available
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology



TO252 Pin Configuration



Description:

The KJD6105 is the high cell density trench P-ch MOSFETs, which provide excellent $R_{DS(on)}$ and gate charge for most of the synchronous buck converter applications. The KJD6105 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

Product Summary

BVDSS	$R_{DS(on)}$	I_D
-60V	35m Ω	-29A

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-60	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^\circ C$	Continuous Drain Current, V_{GS} @ -10V ¹	-29	A
$I_D@T_C=100^\circ C$	Continuous Drain Current, V_{GS} @ -10V ¹	-18.5	A
$I_D@T_A=25^\circ C$	Continuous Drain Current, V_{GS} @ -10V ¹	-6.2	A
$I_D@T_A=70^\circ C$	Continuous Drain Current, V_{GS} @ -10V ¹	-5.0	A
I_{DM}	Pulsed Drain Current ²	-58	A
EAS	Single Pulse Avalanche Energy ³	64.8	mJ
I_{AS}	Avalanche Current	-36	A
$P_D@T_C=25^\circ C$	Total Power Dissipation ⁴	45	W
$P_D@T_A=25^\circ C$	Total Power Dissipation ⁴	2	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	---	62	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	2.8	$^\circ C/W$

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-60	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=-10V, I_D=-20A$	---	30	35	$m\Omega$
		$V_{GS}=-4.5V, I_D=-15A$	---	38	55	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=-250\mu A$	-1.2	-1.6	-2.5	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=-48V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	-1	μA
		$V_{DS}=-48V, V_{GS}=0V, T_J=55^\circ\text{C}$	---	---	-5	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
g_{fs}	Forward Transconductance	$V_{DS}=-5V, I_D=-20A$	---	30	---	S
Q_g	Total Gate Charge (-4.5V)	$V_{DS}=-15V, V_{GS}=-4.5V, I_D=-15A$	---	24	---	nC
Q_{gs}	Gate-Source Charge		---	8.6	---	
Q_{gd}	Gate-Drain Charge		---	7.3	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=-15V, V_{GS}=-10V, R_G=3.3\Omega$ $I_D=-15A$	---	9	---	ns
T_r	Rise Time		---	70.7	---	
$T_{d(off)}$	Turn-Off Delay Time		---	59.8	---	
T_f	Fall Time		---	20.4	---	
C_{iss}	Input Capacitance	$V_{DS}=-15V, V_{GS}=0V, f=1\text{MHz}$	---	2217	---	pF
C_{oss}	Output Capacitance		---	310	---	
C_{rss}	Reverse Transfer Capacitance		---	238	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current ^{1,5}	$V_G=V_D=0V$, Force Current	---	---	-29	A
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V, I_S=-1A, T_J=25^\circ\text{C}$	---	---	-1	V
t_{rr}	Reverse Recovery Time	$I_F=-20A, dI/dt=100A/\mu s$, $T_J=25^\circ\text{C}$	---	30	---	nS
Q_{rr}	Reverse Recovery Charge		---	45	---	nC

Note :

1. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
2. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
3. The EAS data shows Max. rating. The test condition is $V_{DD}=-25V, V_{GS}=-10V, L=0.1mH, I_{AS}=-36A$
4. The power dissipation is limited by 150°C junction temperature
5. The data is theoretically the same as I_D and I_{DM} , in real applications, should be limited by total power dissipation.

Typical Characteristics

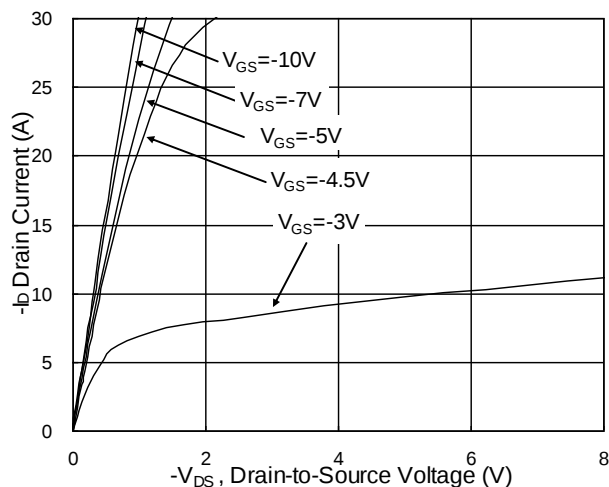


Fig.1 Typical Output Characteristics

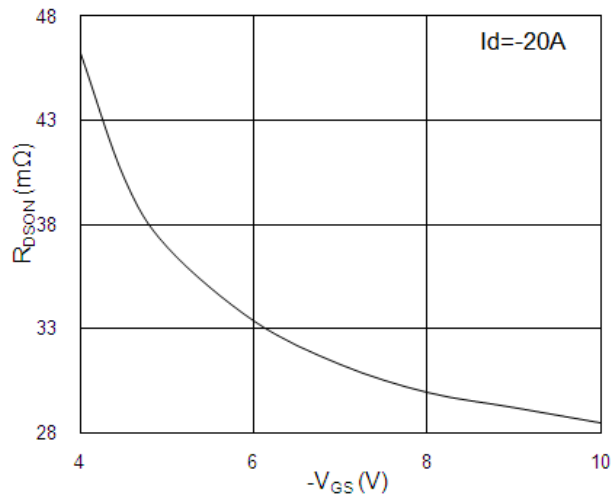


Fig.2 On-Resistance vs G-S Voltage

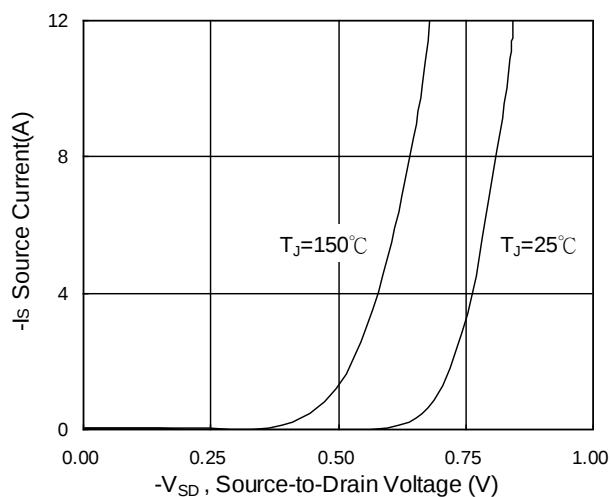


Fig.3 Source Drain Forward Characteristics

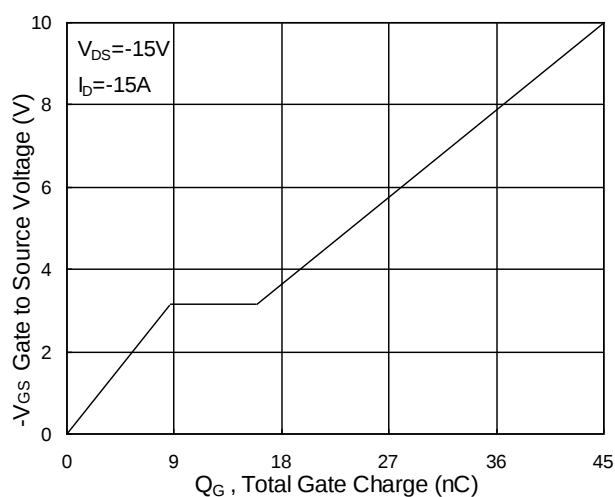


Fig.4 Gate-charge Characteristics

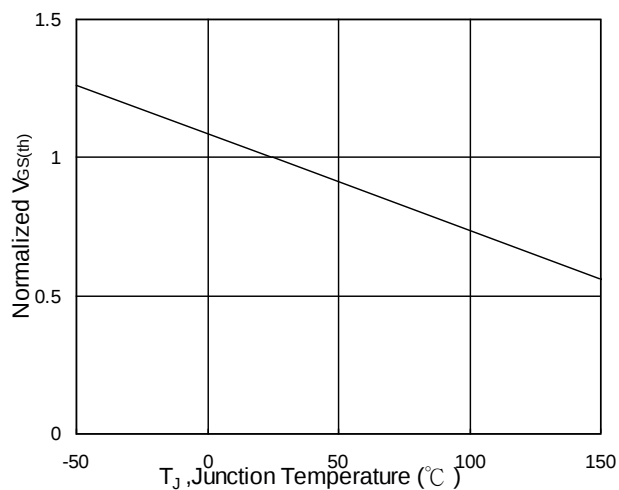


Fig.5 Normalized $V_{GS(th)}$ vs T_J

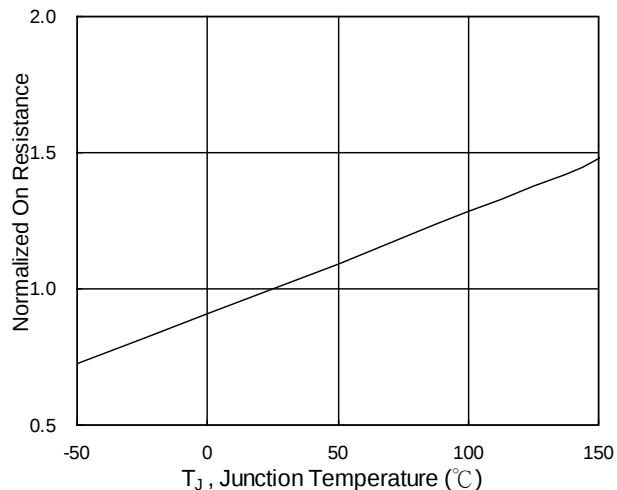


Fig.6 Normalized $R_{DS(on)}$ vs T_J

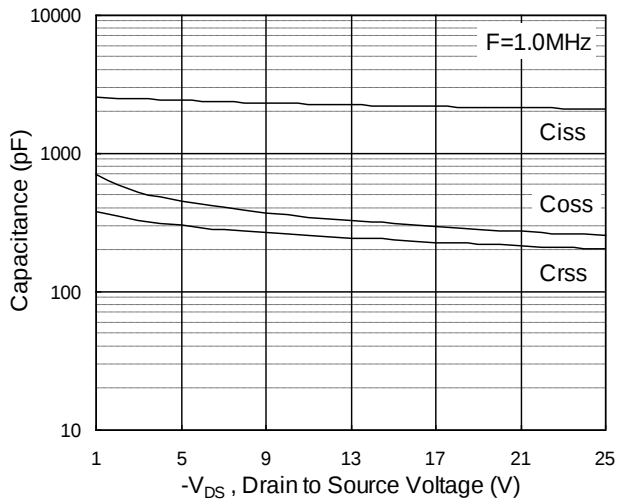


Fig.7 Capacitance

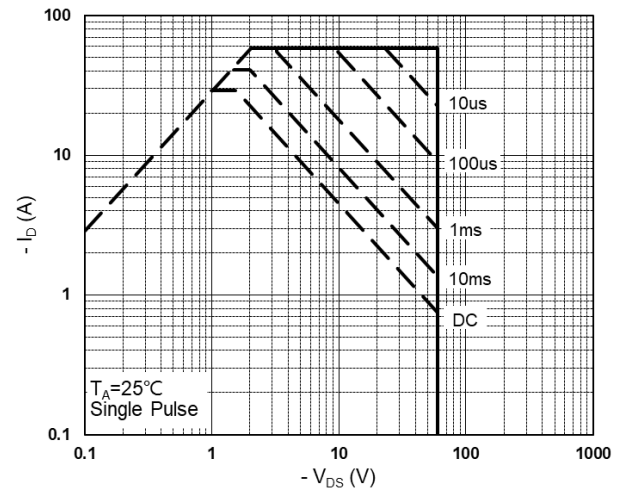


Fig.8 Safe Operating Area

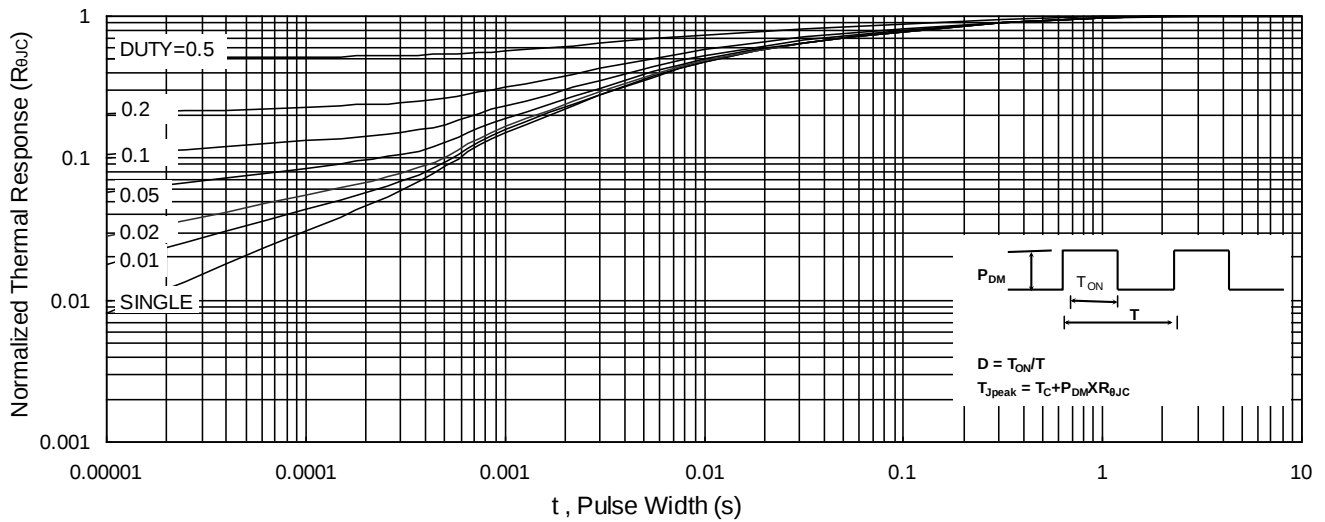


Fig.9 Normalized Maximum Transient Thermal Impedance

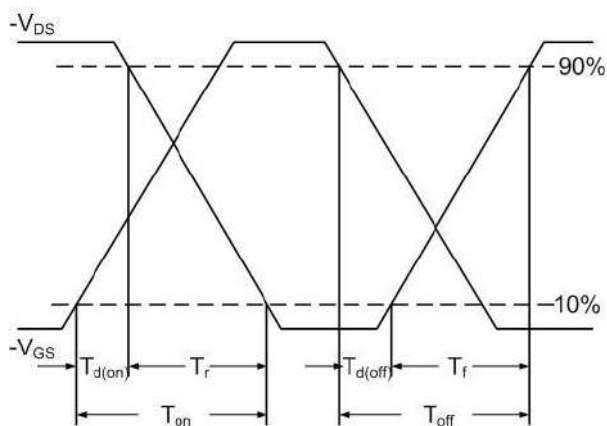


Fig.10 Switching Time Waveform

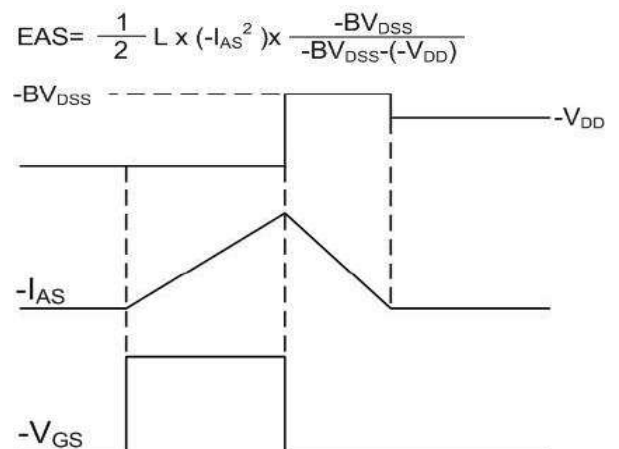


Fig.11 Unclamped Inductive Waveform