

Features

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

Product Summary

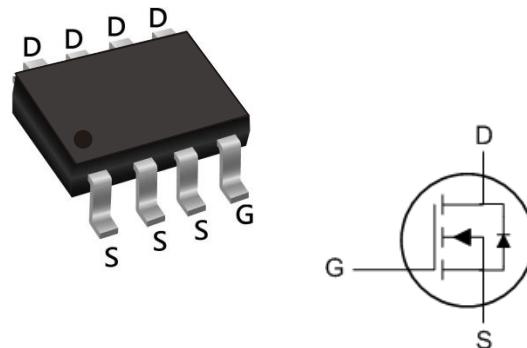
BVDSS	RDS(on)	ID
60V	5.2mΩ	18A

Description

The JHS6040 is the high cell density trenched N-ch MOSFETs, which provide excellent RDS(on) and gate charge for most of the synchronous buck converter applications.

The JHS6040 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

SOP8 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	60	V
V _{GS}	Gate-Source Voltage	±20	V
I _D @T _A =25°C	Continuous Drain Current, V _{GS} @ 10V ¹	18	A
I _D @T _A =100°C	Continuous Drain Current, V _{GS} @ 10V ¹	14	A
I _{DM}	Pulsed Drain Current ²	130	A
EAS	Single Pulse Avalanche Energy ³	125	mJ
I _{AS}	Avalanche Current	50	A
P _D @T _A =25°C	Total Power Dissipation ⁴	3.1	W
T _{STG}	Storage Temperature Range	-55 to 150	°C
T _J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
R _{θJA}	Thermal Resistance Junction-ambient ¹ (t≤10S)	---	45	°C/W
	Thermal Resistance Junction-ambient ¹ (Steady State)	---	80	°C/W

JHS6040

Electrical Characteristics ($T_J=25^\circ C$, 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	$V_{GS}=10V, I_D=18A$	---	4.3	5.2	$m\Omega$
		$V_{GS}=4.5V, I_D=16A$	---	6	7	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	1.2	---	2.5	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=48V, V_{GS}=0V, T_J=25^\circ C$	---	---	1	μA
		$V_{DS}=48V, V_{GS}=0V, T_J=55^\circ C$	---	---	5	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
g_{fs}	Forward Transconductance	$V_{DS}=5V, I_D=18A$	---	65	---	S
Q_g	Total Gate Charge (10V)	$V_{DS}=48V, V_{GS}=10V, I_D=18A$	---	75	---	nC
Q_{gs}	Gate-Source Charge		---	15.5	---	
Q_{gd}	Gate-Drain Charge		---	20.3	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=30V, V_{GS}=10V, R_G=3.3\Omega, I_D=18A$	---	18.5	---	ns
T_r	Rise Time		---	8.8	---	
$T_{d(off)}$	Turn-Off Delay Time		---	58.8	---	
T_f	Fall Time		---	15.8	---	
C_{iss}	Input Capacitance	$V_{DS}=25V, V_{GS}=0V, f=1MHz$	---	4706	---	pF
C_{oss}	Output Capacitance		---	325	---	
C_{rss}	Reverse Transfer Capacitance		---	245	---	

Diode Characteristics

I_s	Continuous Source Current ^{1,5}	$V_G=V_D=0V$, Force Current	---	---	18	A
I_{SM}	Pulsed Source Current ^{2,5}		---	---	130	A
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V, I_s=1A, T_J=25^\circ C$	---	---	1.2	V
t_{rr}	Reverse Recovery Time	$I_F=18A, dI/dt=100A/\mu s, T_J=25^\circ C$	---	22.9	---	nS
Q_{rr}	Reverse Recovery Charge		---	11.6	---	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 $V_{DD}=50V, V_{GS}=10V, L=0.1mH, I_{AS}=50A$
- 4.The power dissipation is limited by $150^\circ C$ 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

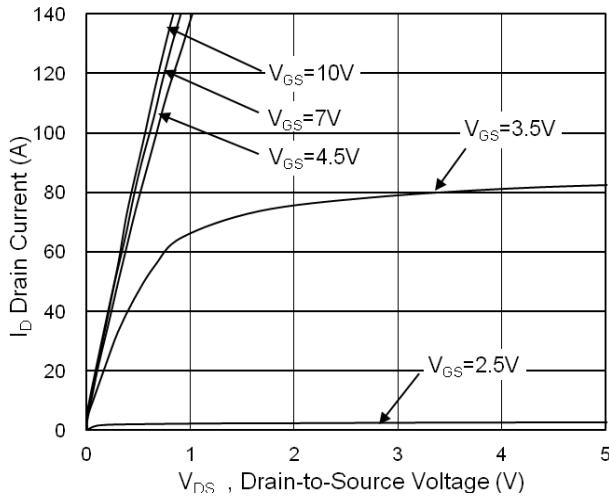


Fig.1 Typical Output Characteristics

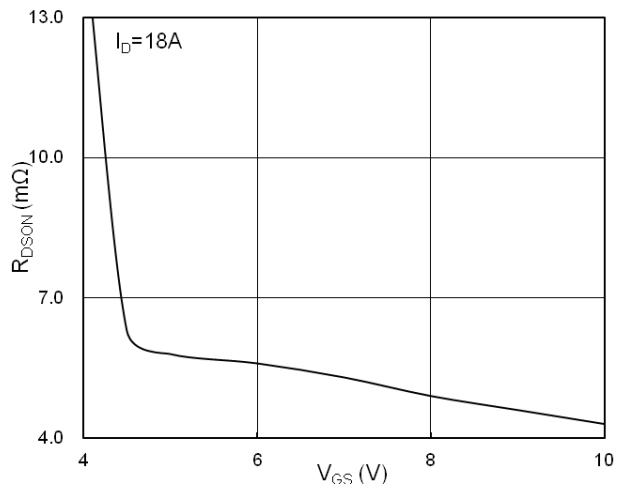


Fig.2 On-Resistance v.s Gate-Source

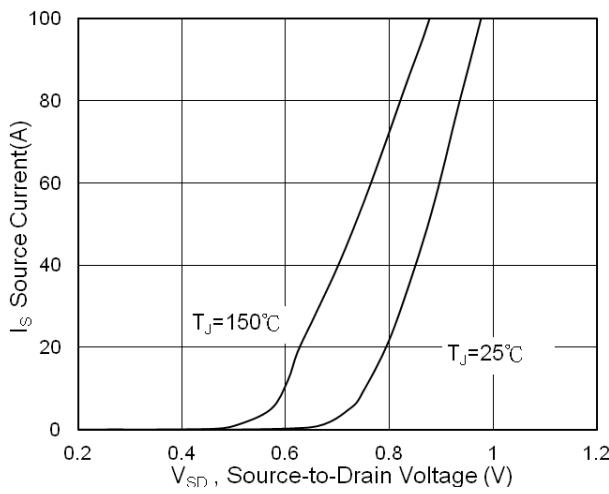


Fig.3 Forward Characteristics of Reverse

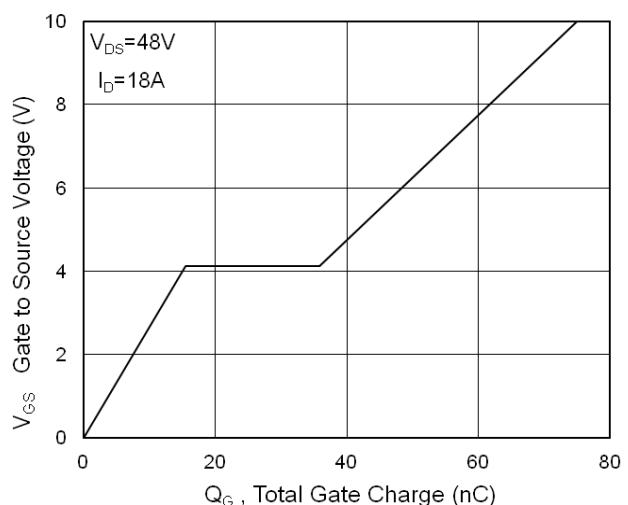


Fig.4 Gate-Charge Characteristics

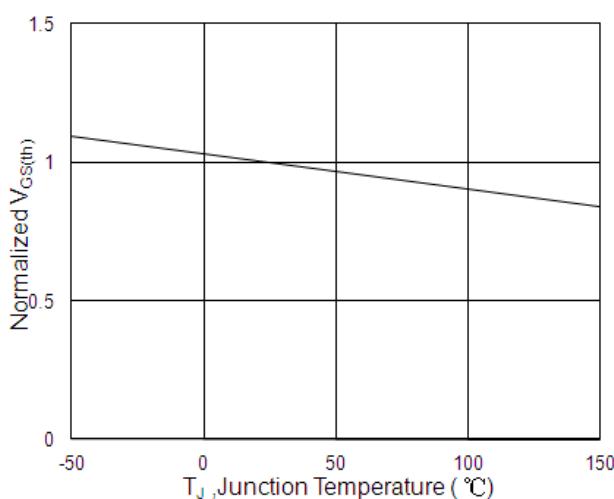


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

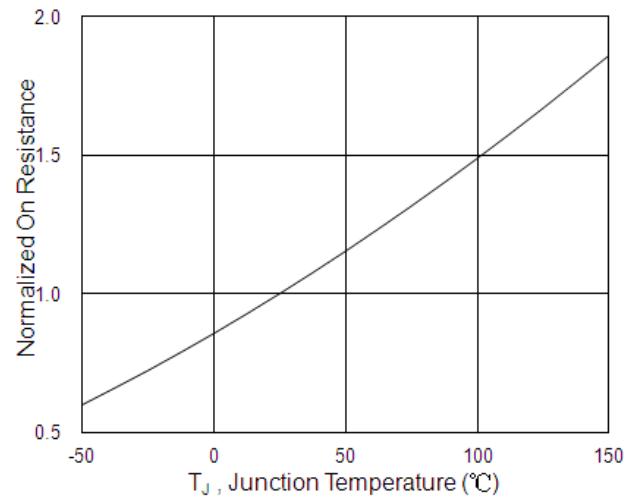


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

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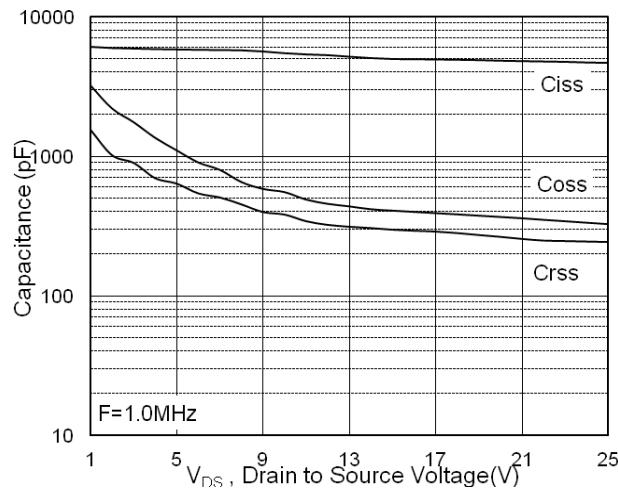


Fig.7 Capacitance

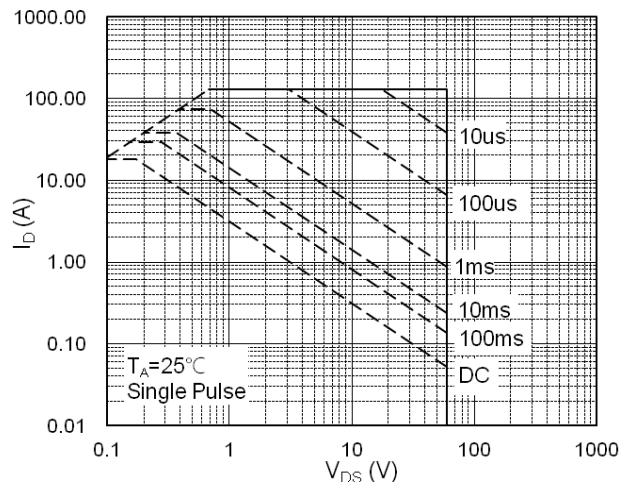


Fig.8 Safe Operating Area

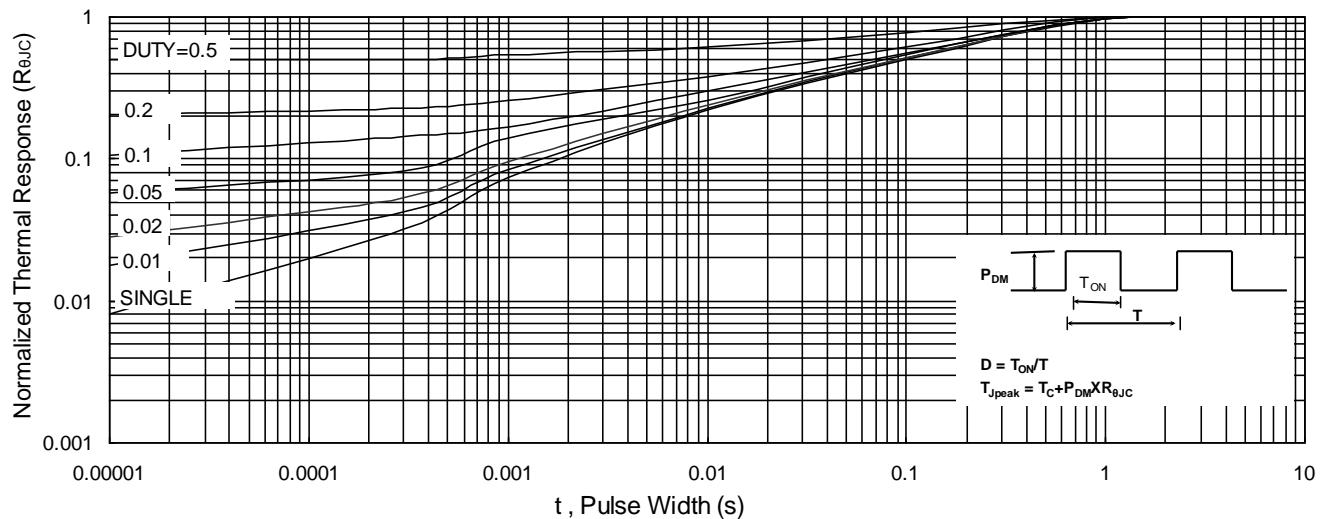


Fig.9 Normalized Maximum Transient Thermal Impedance

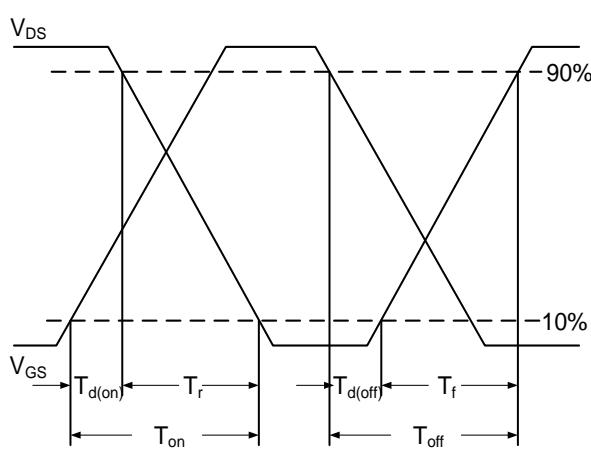


Fig.10 Switching Time Waveform

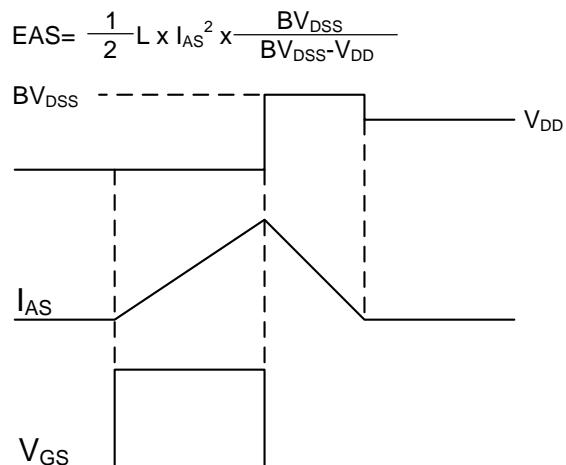
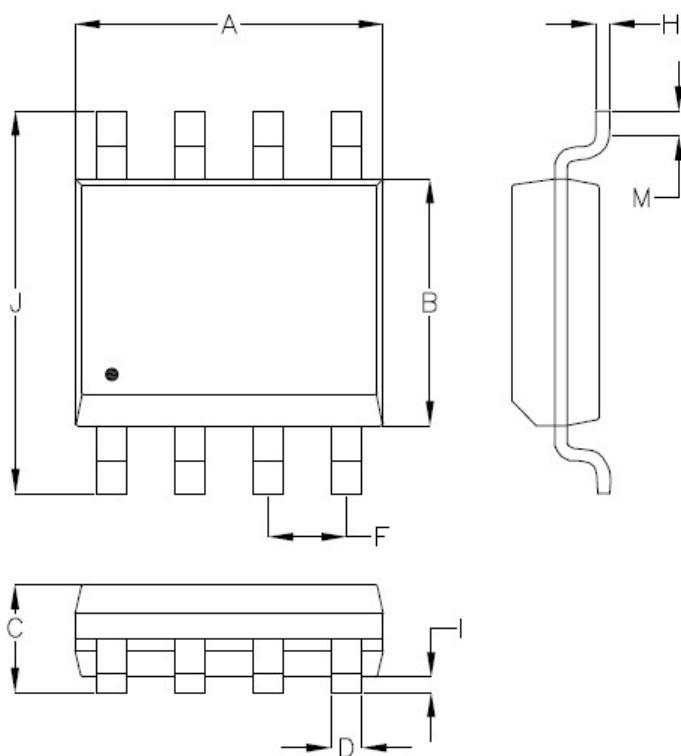


Fig.11 Unclamped Inductive Switching Waveform

SOP-8L Package Outline



SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.700	5.150	0.185	0.203
B	3.700	4.100	0.146	0.161
C	1.23	1.753	0.048	0.069
D	0.310	0.510	0.012	0.020
F	1.070	1.470	0.042	0.058
H	0.160	0.254	0.006	0.010
I	0.050	0.254	0.002	0.010
J	5.750	6.250	0.226	0.246
M	0.400	1.270	0.016	0.050

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