PRODUCT DATA SHEET

To learn more about JGSEMI, please visit our website at

Datasheet Resources Samples

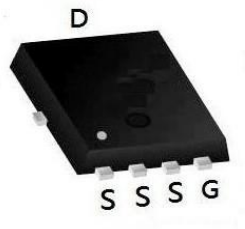
Please note: Please check the JINGAO Semiconductor website to verify the updated device numbers. The most current and up-to-date ordering information can be found at www.jg-semi.cn. Please email any questions regarding the system integration to JINGAO_questions@jgsemi.com.

BSC0702LS

N-Ch 60V Fast Switching MOSFETs

Product Summary

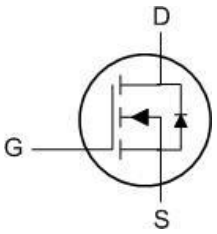
BVDSS	RDSON	ID
60V	2.4mΩ	125A



PDFN5060-8L

Features

- Split Gate Trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$



Applications

- DC-DC Converters
- Power management functions
- Synchronous-rectification applications

Absolute Maximum Ratings:

Symbol	Parameter		Value	Units
V_{DSS}	Drain-to-Source Voltage		60	V
I_D	Continuous Drain Current	T_C = 25 °C	125	A
	Continuous Drain Current	T_C = 100 °C	101	A
I_{DM}[a1]	Pulsed Drain Current		641	A
E_{AS}[a2]	Single pulse avalanche energy		189	mJ
V_{GS}	Gate-to-Source Voltage		±20	V
P_D	Power Dissipation		113	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range		150, –55 to 150	℃
T_L	Maximum Temperature for Soldering		260	℃

Thermal Characteristics:

Symbol	Parameter	Value	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	1.11	℃/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	39.4	℃/W

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

Static Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
V_{DSS}	Drain to Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	60	--	--	V
I_{DSS}	Drain to Source Leakage Current	V_{DS} = 60V, V_{GS}= 0V	--	--	1	μA
$I_{GSS(F)}$	Gate to Source Forward Leakage	V_{GS} =+20V	--	--	100	nA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	V_{GS} =-20V	--	--	-100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D = 250μA	1.2	--	2.2	V
$R_{DS(ON)}$	Drain-to-Source On-Resistance	V_{GS}=10V, I_D=20A	--	2.4	2.9	mΩ

Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
C_{iss}	Input Capacitance	V_{GS} = 0V V_{DS} = 30V f = 1.0MHz	--	4610	6915	pF
C_{oss}	Output Capacitance		--	2188	3282	
C_{rss}	Reverse Transfer Capacitance		--	66	132	
R_g	Gate resistance		--	0.93	18.8	Ω

Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	I_D =40A V_{DS} = 30V V_{GS} = 10V R_G = 2.7Ω	--	14.13	--	ns
tr	Rise Time		--	63.73	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	46.8	--	
t_f	Fall Time		--	105.07	--	
Q_g	Total Gate Charge	V_{GS} =10V V_{DS} = 30V I_D =40A	--	74.37	111.56	nC
Q_{gs}	Gate Source Charge		--	17.26	--	
Q_{gd}	Gate Drain Charge		--	9.44	18.88	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
I_S	Diode Forward Current	T_C =25 °C	--	--	125	A
V_{SD}	Diode Forward Voltage	I_S=40A, V_{GS}=0V	--	0.83	1.2	V
t_{rr}	Reverse Recovery time	I_S=40A, dI/dt=300A/μs	--	52.78	105.56	ns
Q_{rr}	Reverse Recovery Charge		--	56.31	112.62	nC

[a1]: Repetitive rating; pulse width limited by maximum junction temperature [a2]: VDD=30V, L=0.3mH, Rg=25Ω, Starting TJ=25 ℃

TypicalTPerformanceTCharacteristics

Fig 1: Output Characteristics

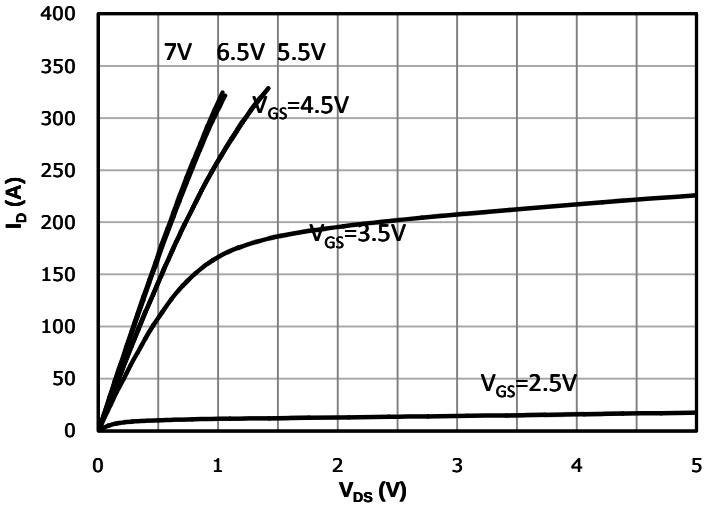


Fig 2: Transfer Characteristics

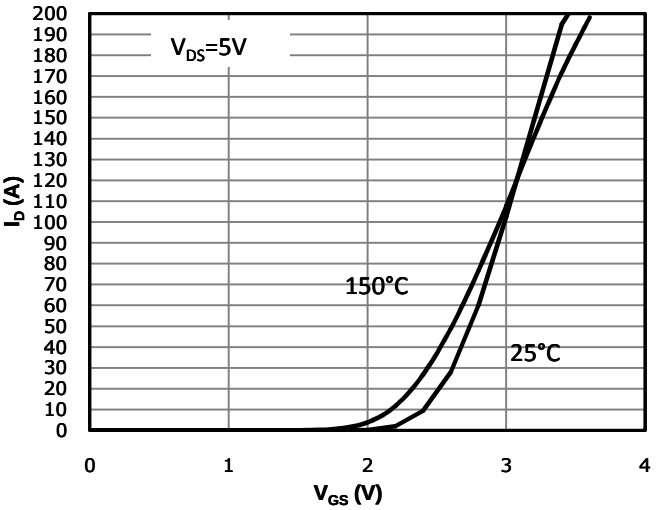


Fig 3: Rds(on) vs Drain Current and Gate Voltage

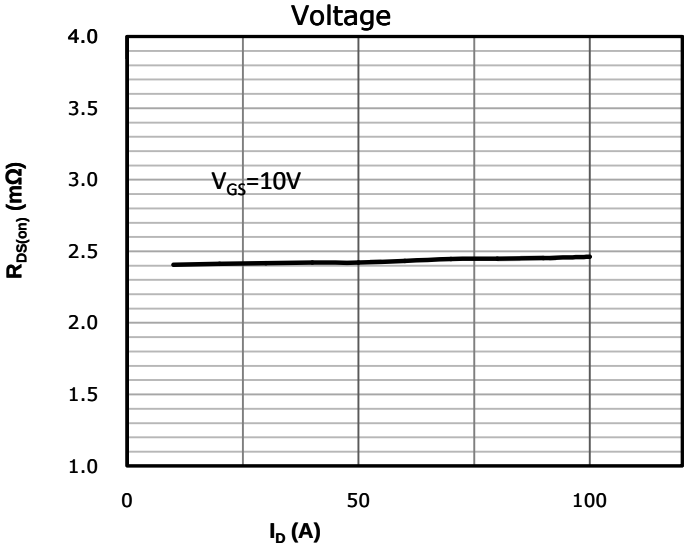


Fig 4: Rds(on) vs Gate Voltage

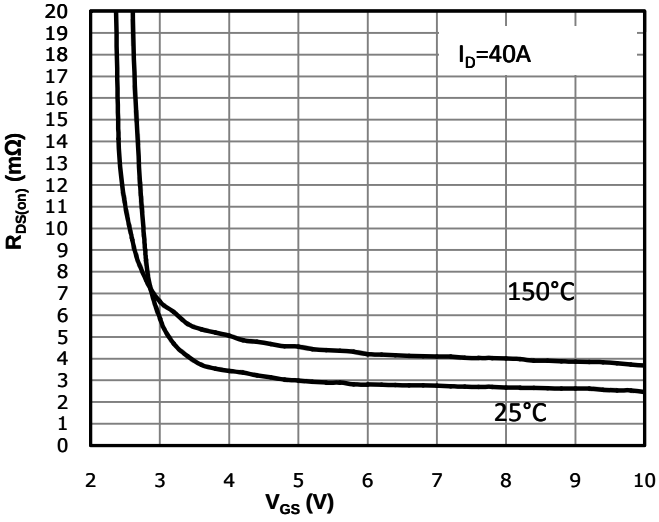


Fig 5: Rds(on) vs. Temperature

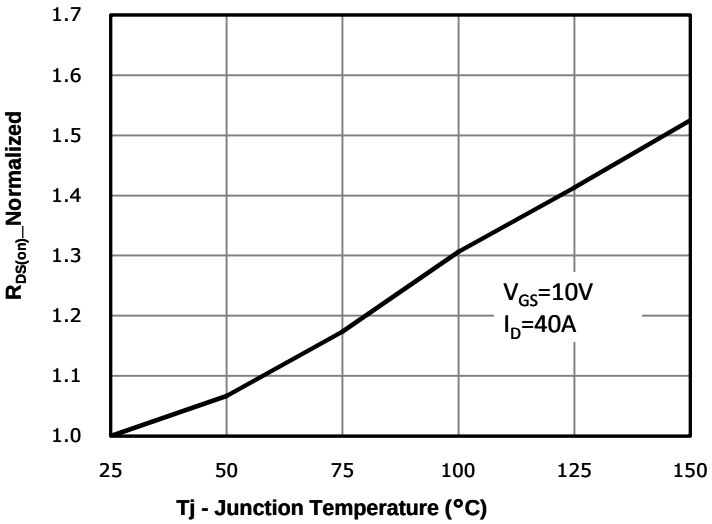


Fig 6: Capacitance Characteristics

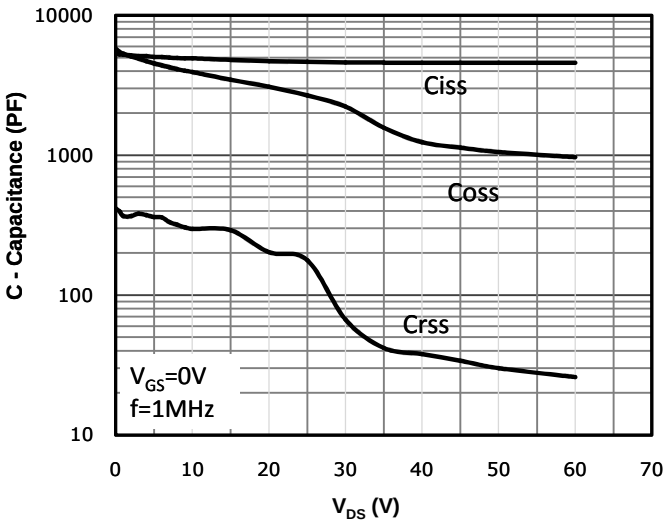


Fig 7: Gate ChargeCharacteristics

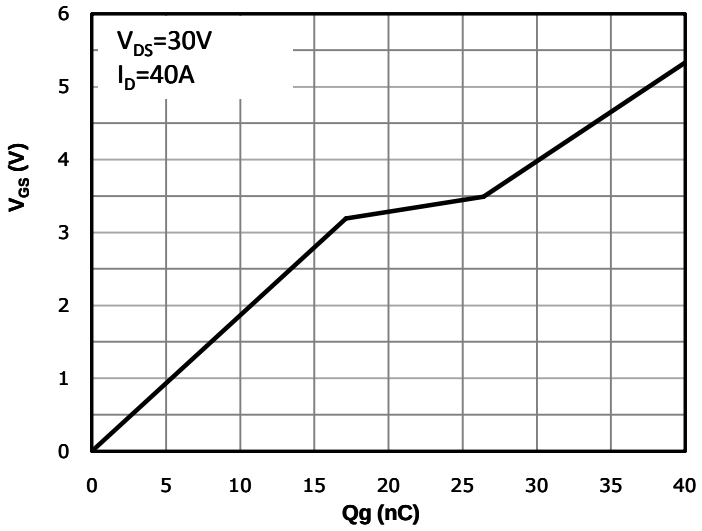


Fig 8: Body-diode Forward Characteristics

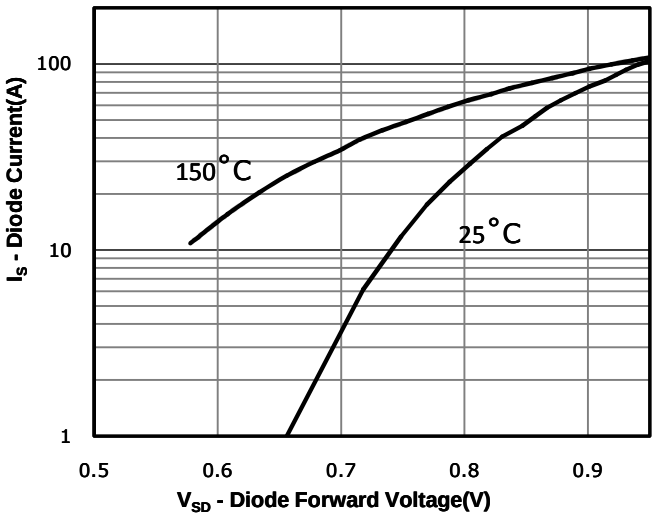


Fig 9: Power Dissipation

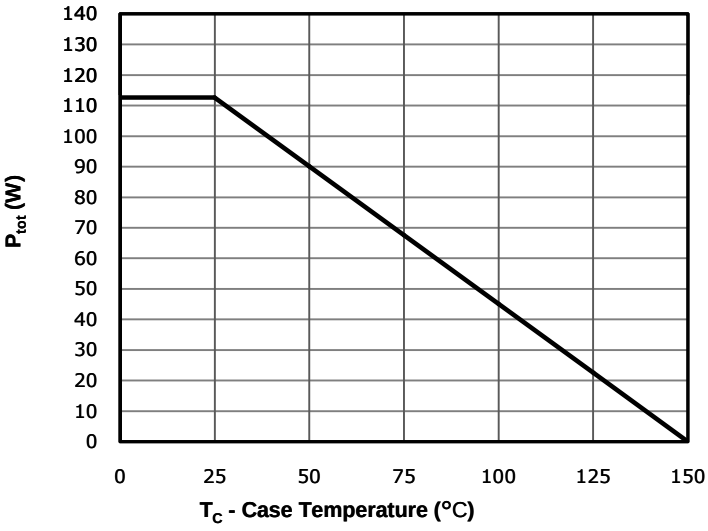


Fig 10: Drain Current Derating

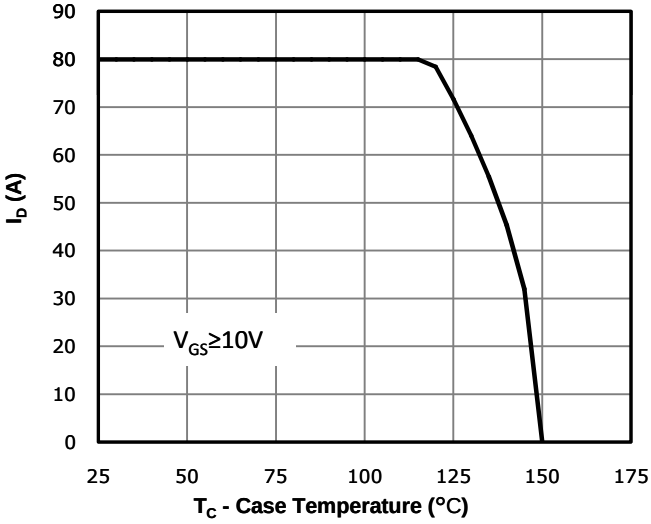


Fig 11: Safe Operating Area

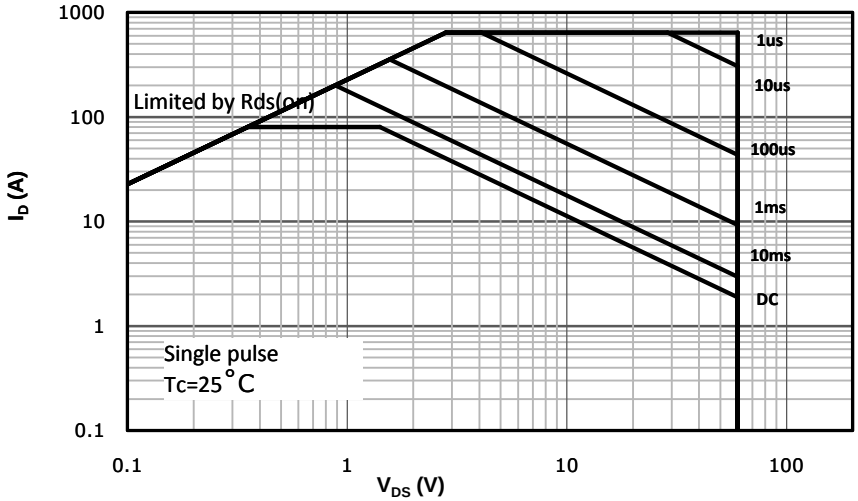
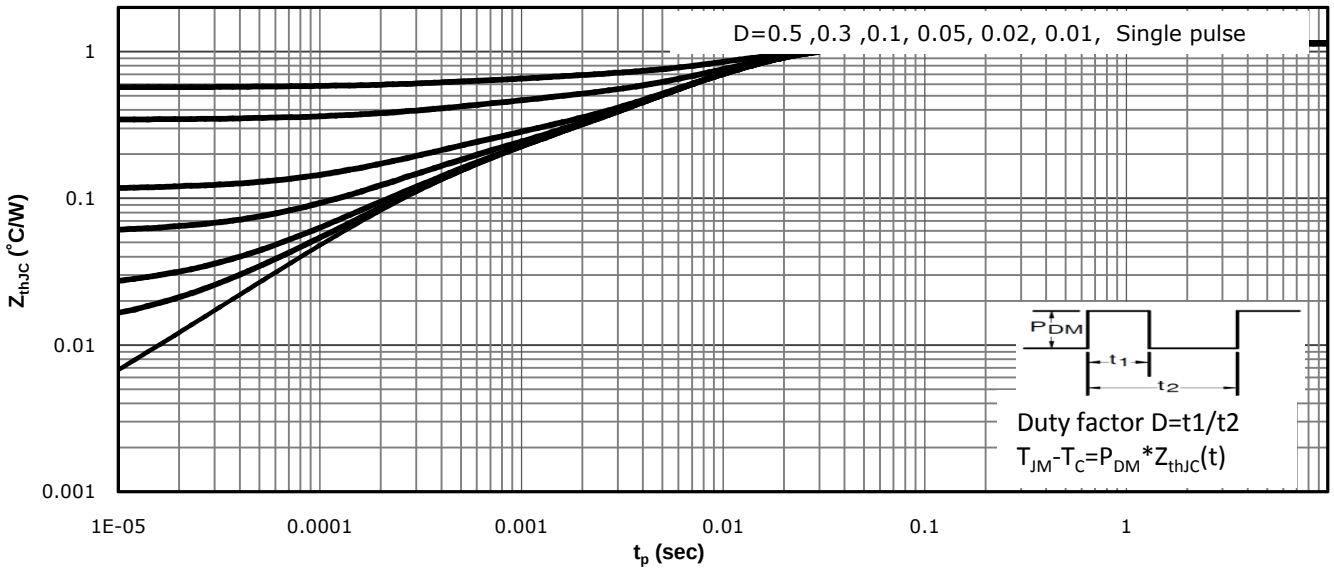
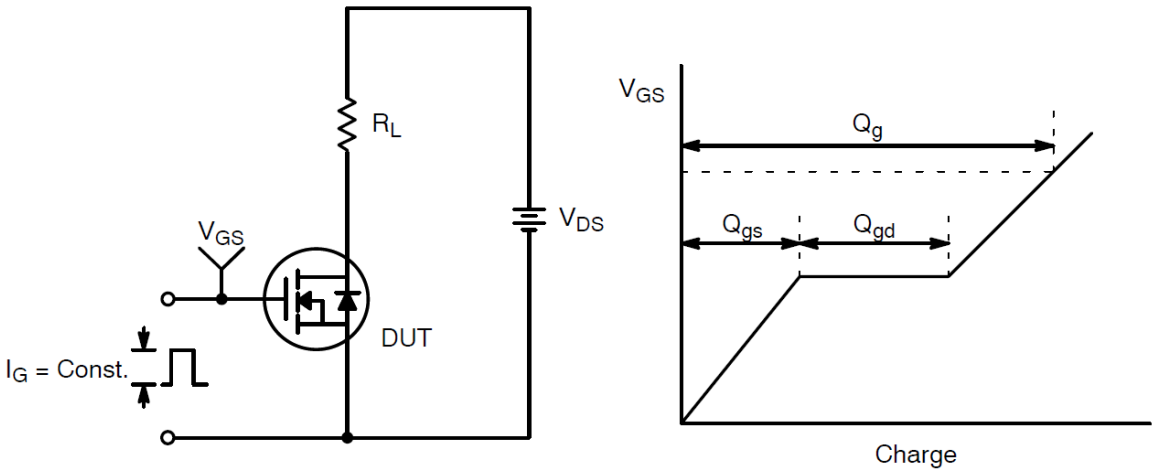


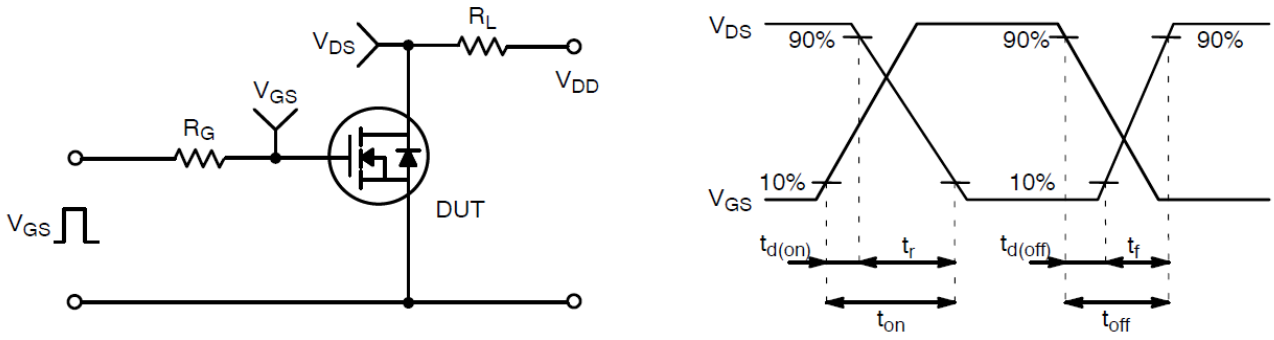
Fig 12: Max. Transient Thermal Impedance



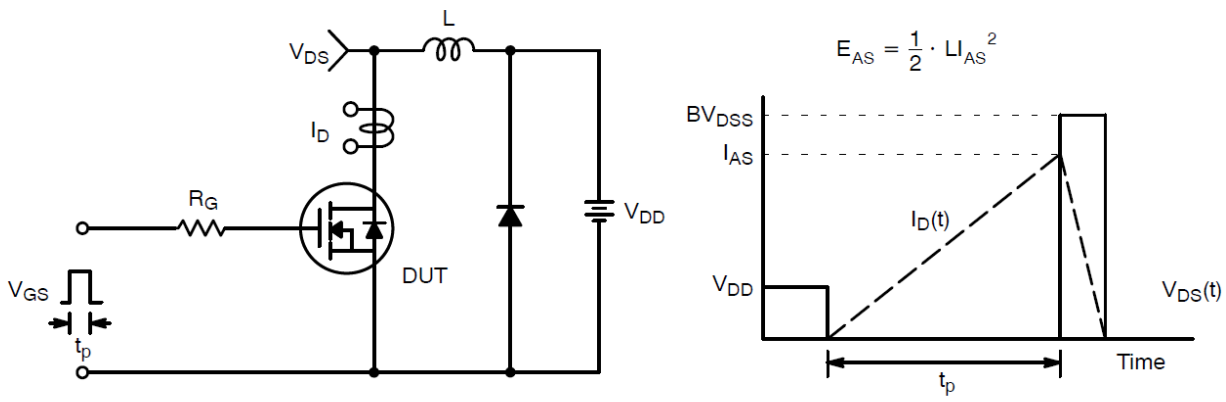
Test Circuit and Waveform:



Gate Charge Test Circuit & Waveform

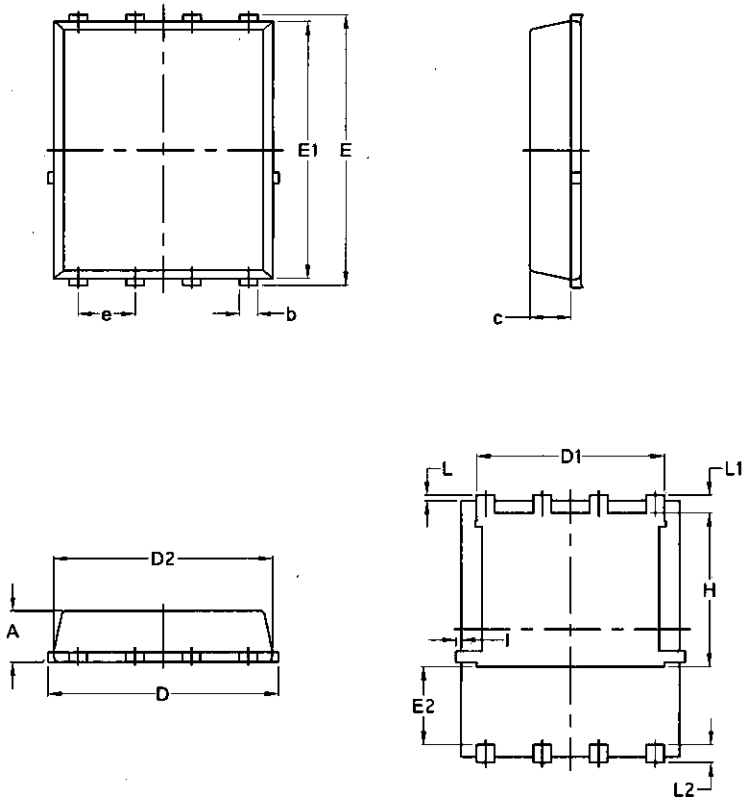


Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms

Package Mechanical Data-PDFN5060-8L-Single



Symbol	Common			
	mm		Inch	
	Mim	Max	Min	Max
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.0970	0.0324	0.082
D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.00	0.1890	0.1969
E	5.95	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.60	/	0.0630	/
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.0020	0.0098
L1	0.38	0.50	0.0150	0.0197
L2	0.38	0.50	0.0150	0.0197
H	3.30	3.50	0.1299	0.1378
I	/	0.18	/	0.0070

Attention

1, Any and all JGSEMI products described or contained herein do not have specifications that can handle applications that require extremely high levels of reliability, such as life-support systems, aircraft's control systems, orother applic ations whose failure can be reasonably expected to result in serious physical or material damage. Consult with your JGSEMI representative nearest you before using any JGSEMI products described or contained herein in such applicati ons.

2,JGSEMI assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all JGSEMI products described or contained herein.

3, Specifications of any and all JGSEMI products described or contained herein stipulate the performance, characteri stics, and functions of the described products in the independent state, and are not guarantees of the performance, characteristics, and functions of the described products as mounted in the customer's products or equipment. To ver ify symptoms and states that cannot be evaluated in an independent device, the customer should always evaluate an d test devices mounted in the customer's products or equipment.

4,In the event that any or all JGSEMI products(including technical data, services) described or contained herein are controlled under any of applicable local export control laws and regulations, such products must not be exported wit hout obtaining the export license from the authorities concerned in accordance with the above law.

6, Any and all information described or contained herein are subject to change without notice due to product technology improvement,etc. When designing equipment, refer to the "Delivery Specification" for the JGSEMI produ ct that you Intend to use.