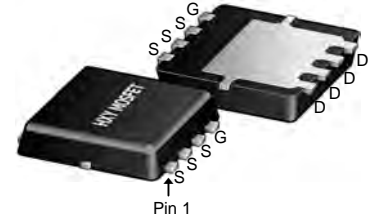




## General Description

The BSC0702LSATMA1 use advanced SGT MOSFET technology to provide low RDS(ON), low gate charge, fast switching and excellent avalanche characteristics.

This device is specially designed to get better ruggedness and suitable to use in



DFN5X6-8L

## General Features

$V_{DS} = 60V$   $I_D = 125A$

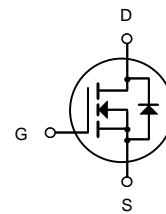
$R_{DS(ON)} < 2.9m\Omega @ V_{GS} = 10V$

## Applications

Consumer electronic power supply Motor control

Synchronous-rectification Isolated DC

Synchronous-rectification applications



N-Channel MOSFET

## Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
BSC0702LSATMA1	DFN5X6-8L	0702LS XXXX	5000

## Absolute Maximum Ratings ( $T_C = 25^\circ C$ unless otherwise noted)

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	60	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D @ T_C = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	125	A
$I_D @ T_C = 100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	101	A
$I_{DM}$	Pulsed Drain Current <sup>2</sup>	641	A
EAS	Single Pulse Avalanche Energy <sup>3</sup>	189	mJ
$P_D @ T_C = 25^\circ C$	Total Power Dissipation <sup>4</sup>	113	W
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ C$
$T_J$	Operating Junction Temperature Range	-55 to 150	$^\circ C$
$R_{\theta JC}$	Thermal Resistance from Junction-to-Ambient <sup>3</sup>	1.11	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient <sup>1</sup>	39.4	$^\circ C/W$



### Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	60	-	-	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =60V, V <sub>GS</sub> =0V,	-	-	1.0	μA
I <sub>GSS</sub>	Gate to Body Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> = ±20V	-	-	±100	nA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.2	1.6	2.2	V
R <sub>DS(on)</sub>	Static Drain-Source on-Resistance <small>note3</small>	V <sub>GS</sub> =10V, I <sub>D</sub> =20A	-	2.4	2.9	mΩ
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V, f=1.0MHz	-	4610	6915	pF
C <sub>oss</sub>	Output Capacitance		-	2188	3282	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		-	66	132	pF
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =30V, I <sub>D</sub> =40A, V <sub>GS</sub> =10V	-	74.37	111.56	nC
Q <sub>gs</sub>	Gate-Source Charge		-	17.26	-	nC
Q <sub>gd</sub>	Gate-Drain("Miller") Charge		-	9.44	18.88	nC
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DD</sub> =30V, I <sub>D</sub> =40A, R <sub>G</sub> =2.7Ω, V <sub>GS</sub> =10V	-	14.13	-	ns
t <sub>r</sub>	Turn-on Rise Time		-	63.73	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time		-	46.8	-	ns
t <sub>f</sub>	Turn-off Fall Time		-	105.07	-	ns
I <sub>S</sub>	Maximum Continuous Drain to Source Diode Forward Current		-	-	125	A
I <sub>SM</sub>	Maximum Pulsed Drain to Source Diode Forward Current		-	-	641	A
V <sub>SD</sub>	Drain to Source Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =40A	-	-	1.2	V
t <sub>rr</sub>	Body Diode Reverse Recovery Time	T <sub>J</sub> =25°C, I <sub>F</sub> =40A, di/dt=100A/μs	-	52.78	105.56	ns
Q <sub>rr</sub>	Body Diode Reverse Recovery Charge		-	56.31	112.62	nC

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition: T<sub>J</sub>=25°C, V<sub>DD</sub>=30V, V<sub>G</sub>=10V, R<sub>G</sub>=25Ω, L=0.5mH, I<sub>AS</sub>=12A

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%



### Typical Characteristics

Fig 1: Output Characteristics

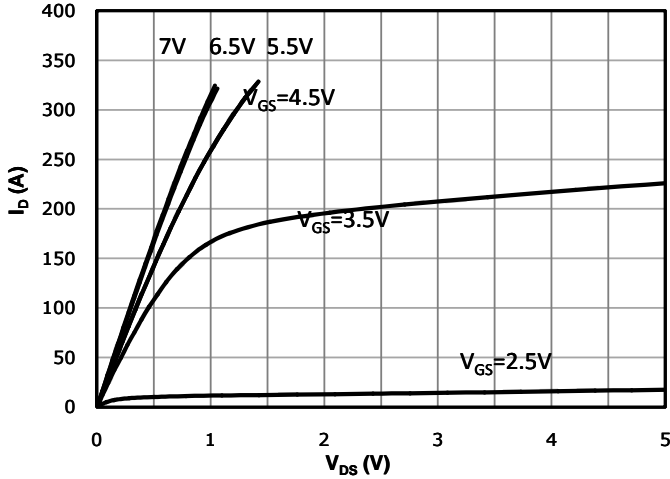


Fig 2: Transfer Characteristics

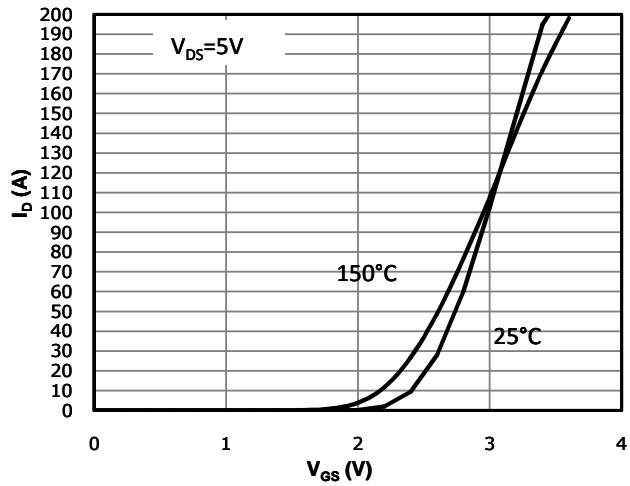


Fig 3:  $R_{DS(on)}$  vs Drain Current and Gate Voltage

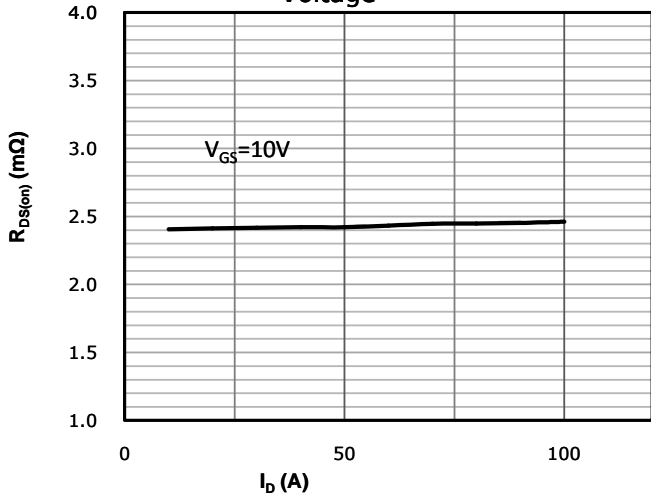


Fig 4:  $R_{DS(on)}$  vs Gate Voltage

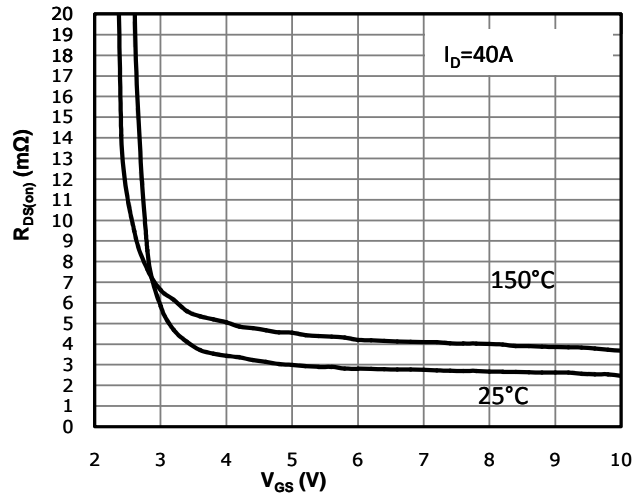


Fig 5:  $R_{DS(on)}$  vs. Temperature

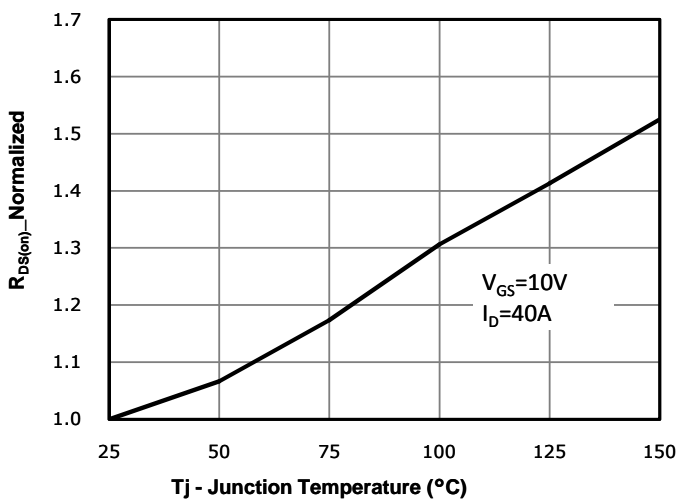


Fig 6: Capacitance Characteristics

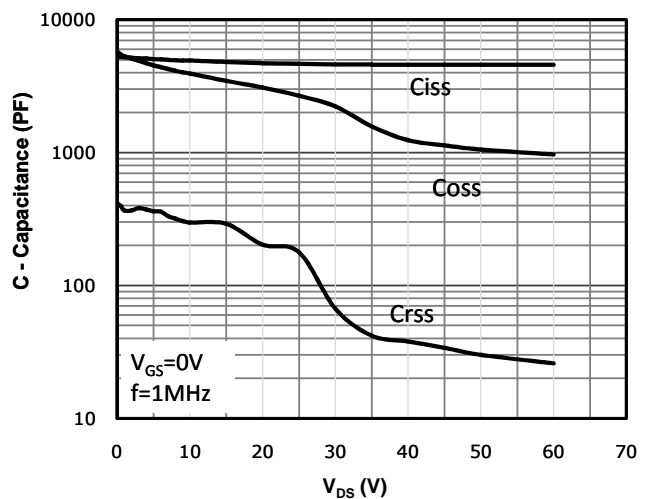




Fig 7: Gate Charge Characteristics

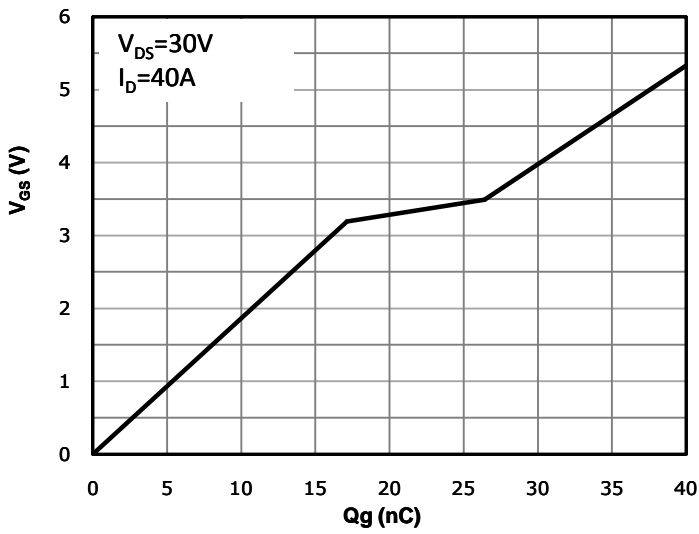


Fig 8: Body-diode Forward Characteristics

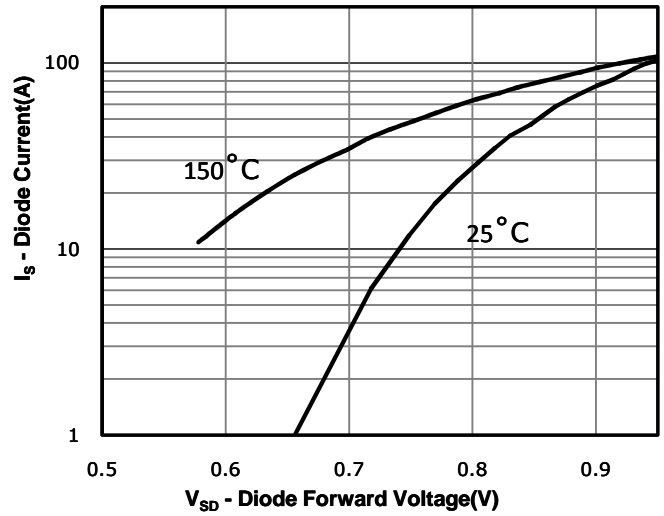


Fig 9: Power Dissipation

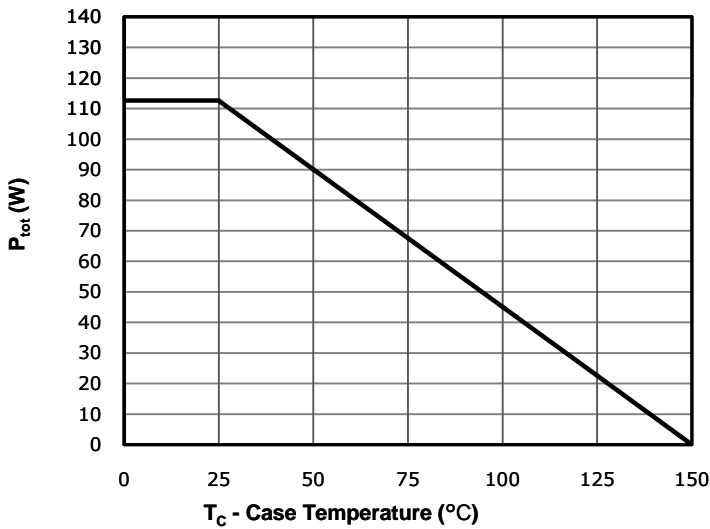


Fig 10: Drain Current Derating

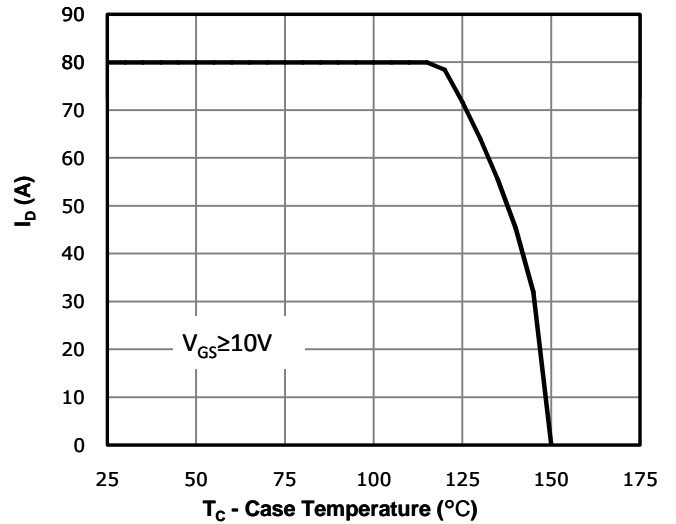


Fig 11: Safe Operating Area

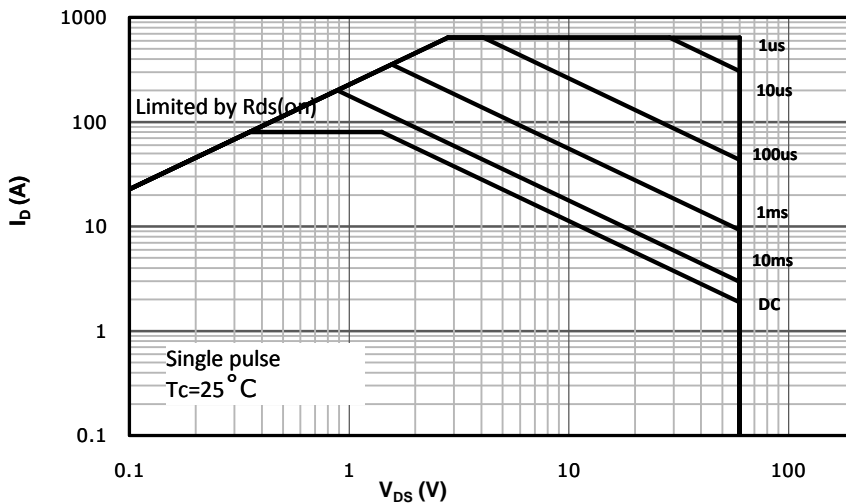
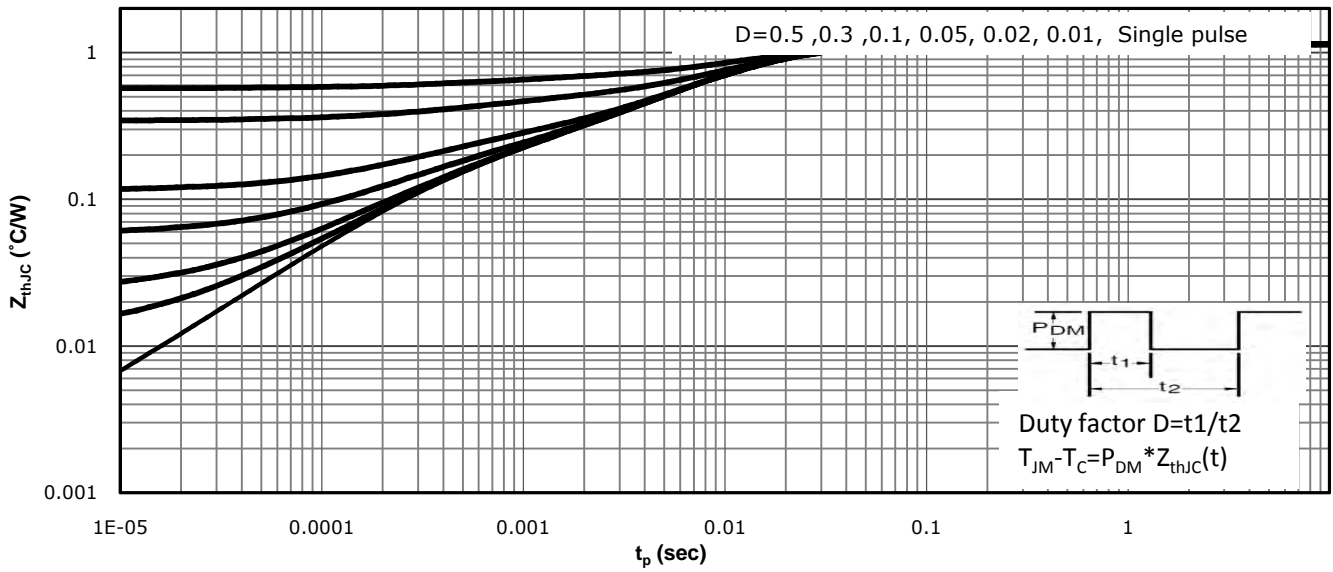


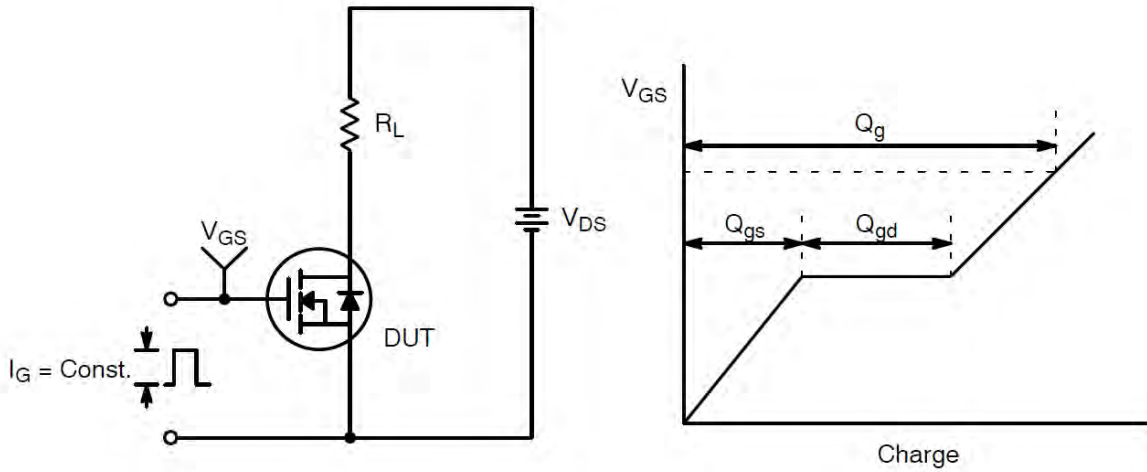


Fig 12: Max. Transient Thermal Impedance

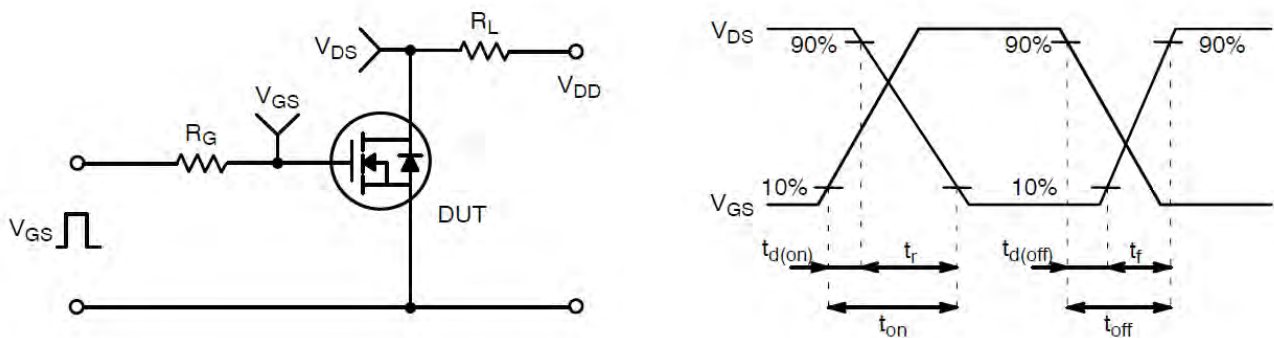




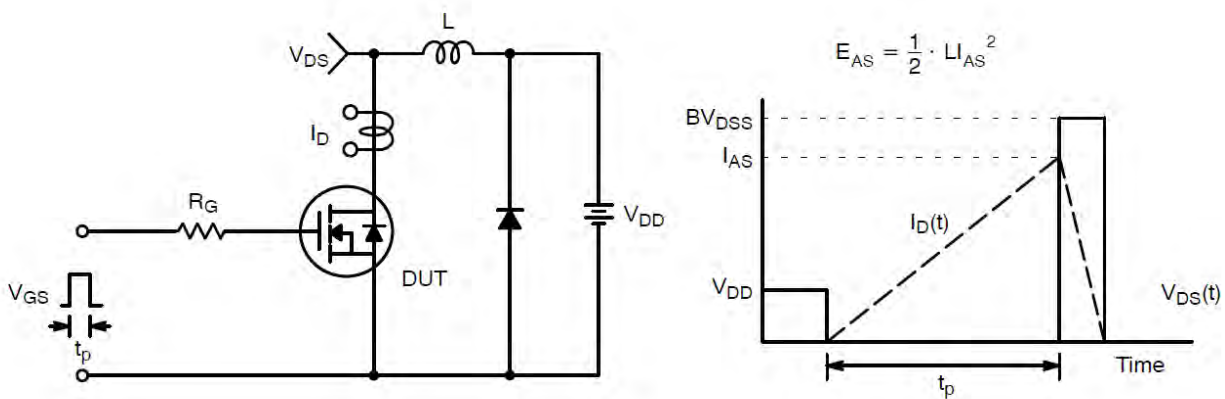
### Test Circuit and Waveform:



Gate Charge Test Circuit & Waveform



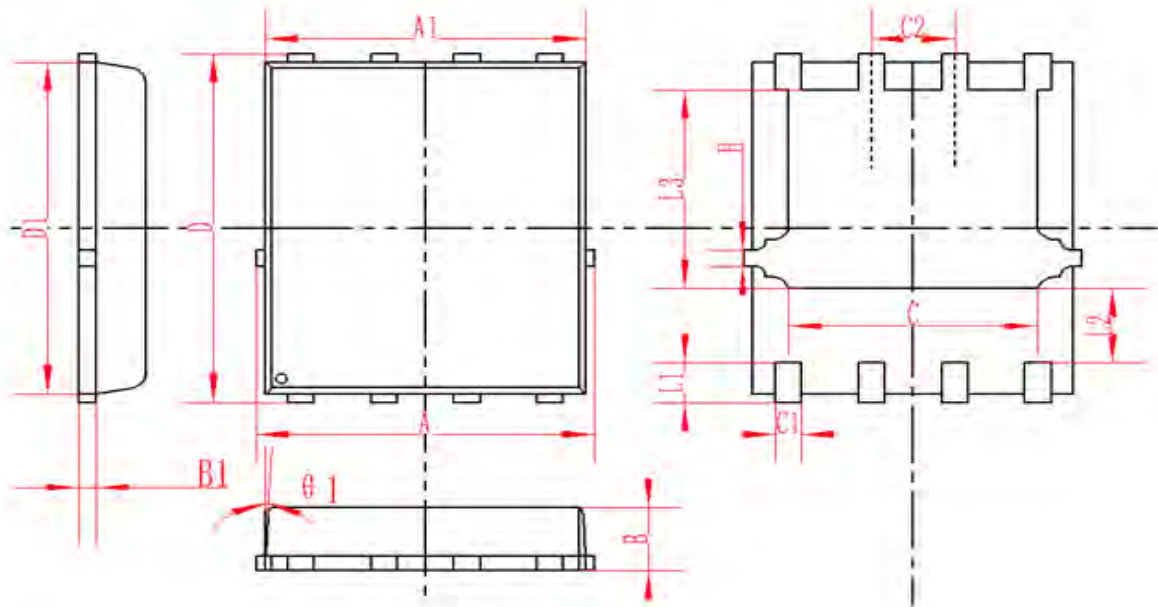
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms



### DFN5X6-8L Package Information



SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	4.95	5	5.05	0.195	0.197	0.199
A1	4.82	4.9	4.98	0.190	0.193	0.196
D	5.98	6	6.02	0.235	0.236	0.237
D1	5.67	5.75	5.83	0.223	0.226	0.230
B	0.9	0.95	1	0.035	0.037	0.039
B1	0.254REF			0.010REF		
C	3.95	4	4.05	0.156	0.157	0.159
C1	0.35	0.4	0.45	0.014	0.016	0.018
C2	1.27TYP			0.5TYP		
$\theta 1$	8°	10°	12°	8°	10°	12°
L1	0.63	0.64	0.65	0.025	0.025	0.026
L2	1.2	1.3	1.4	0.047	0.051	0.055
L3	3.415	3.42	3.425	0.134	0.135	0.135
H	0.24	0.25	0.26	0.009	0.010	0.010



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