

## P-Channel Enhancement Mode Power MOSFET

### DESCRIPTION

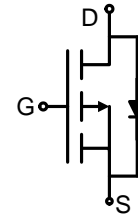
The BLM4407 uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 4.5V.

### GENERAL FEATURES

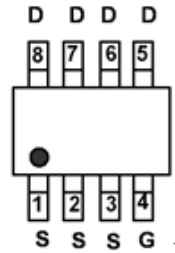
- $V_{DS} = -30V, I_D = -12A$   
 $R_{DS(ON)} < 25m\Omega @ V_{GS} = -4.5V$   
 $R_{DS(ON)} < 15m\Omega @ V_{GS} = -10V$
- High Power and current handing capability
- Lead free product is acquired
- Surface Mount Package

### Application

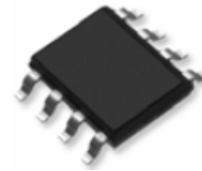
- Battery Switch
- Load Switch
- Power Management



Schematic diagram



Marking and pin Assignment



SOP-8 top view

### Package Marking And Ordering Information

Device Marking	Ordering Codes	Package	Product Code	Packing
4407	BLM4407	SOP-8	BLM4407	Reel

### Absolute Maximum Ratings (TA=25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	$V_{DS}$	-30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current-Continuous	$I_D$	-12	A
Drain Current-Pulsed (Note 1)	$I_{DM}$	-48	A
Maximum Power Dissipation( $T_c=25^\circ C$ )	$P_D$	3	W
Maximum Power Dissipation( $T_c=100^\circ C$ )		1.3	
Single pulse avalanche energy (Note 2)	$E_{AS}$	171	mJ
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 To 150	$^\circ C$

### Thermal Characteristic

Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	41	$^\circ C/W$
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**Electrical Characteristics (TA=25°C unless otherwise noted)**

Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-30	-33	-	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-30V, V_{GS}=0V$	-	-	-1	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA
<b>On Characteristics</b>						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1	-1.5	-3	V
Drain-Source On-State Resistance (Note 3)	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-6A$	-	11.5	15	m $\Omega$
		$V_{GS}=-4.5V, I_D=-6A$	-	18	25	m $\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS}=-10V, I_D=-12A$	16	-	-	S
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=-15V, V_{GS}=0V,$ $F=1.0MHz$	-	2628	-	PF
Output Capacitance	$C_{oss}$		-	294	-	PF
Reverse Transfer Capacitance	$C_{rss}$		-	271	-	PF
<b>Switching Characteristics</b>						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=-15V, I_D=-12A,$ $V_{GS}=-10V, R_{GEN}=1\Omega$	-	9	-	nS
Turn-on Rise Time	$t_r$		-	8	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	28	-	nS
Turn-Off Fall Time	$t_f$		-	10	-	nS
Total Gate Charge	$Q_g$	$V_{DS}=-15V, I_D=-12A$ $V_{GS}=-10V$	-	55.3	-	nC
Gate-Source Charge	$Q_{gs}$		-	7.9	-	nC
Gate-Drain Charge	$Q_{gd}$		-	11.3	-	nC
<b>Drain-Source Diode Characteristics</b>						
Diode Forward Voltage (Note 3)	$V_{SD}$	$V_{GS}=0V, I_S=-12A$	-	-	-1.2	V

**Notes:**

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2.  $I_{AS} = -34A, V_{DD} = -30V, R_G = 25\Omega, \text{Starting } T_j = 25^\circ C.$
3. Pulse Test: Pulse Width  $\leq 300\mu s, \text{Duty Cycle } \leq 2\%.$

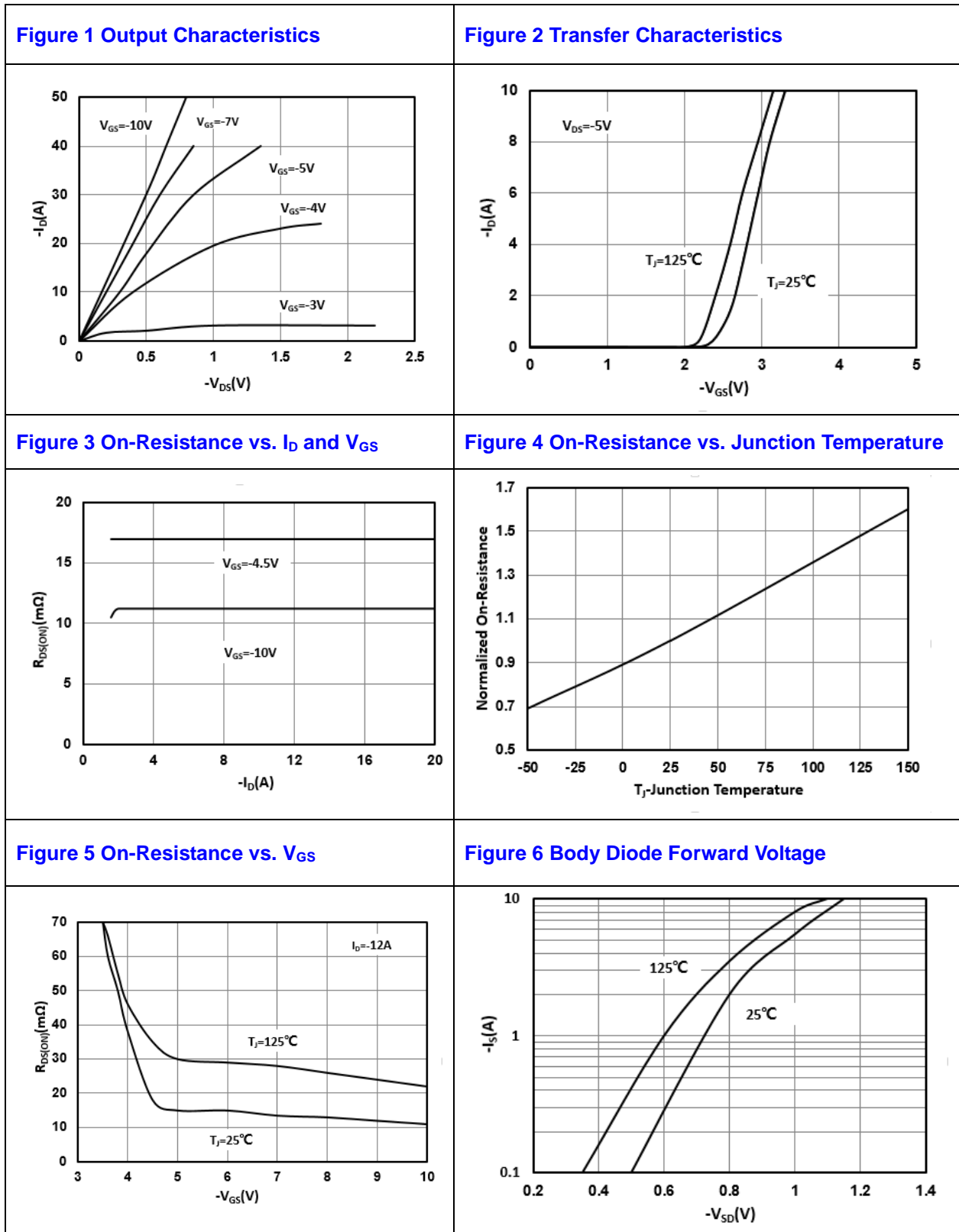
**Characteristics Curves**


Figure 7 Gate-Charge Characteristics

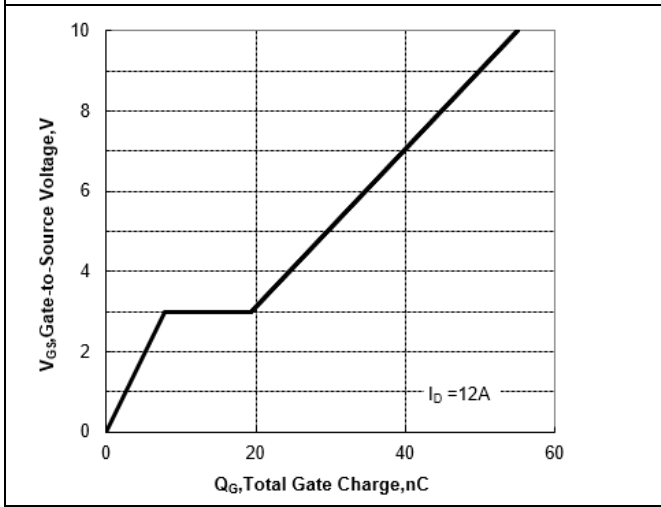


Figure 8 Capacitance Characteristics

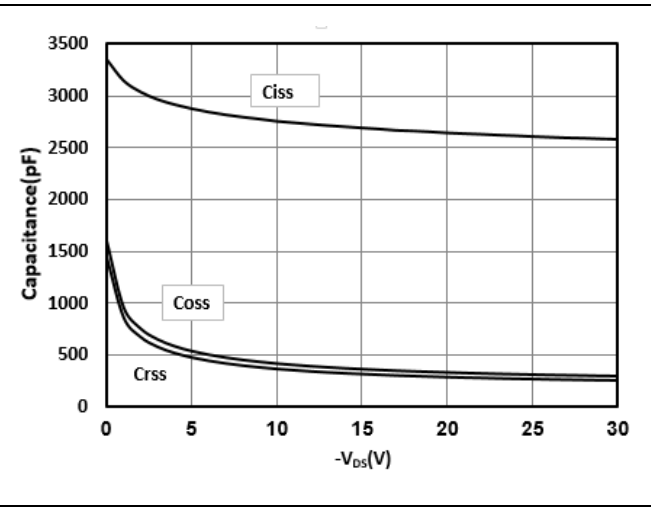


Figure 9 Safe Operation Area

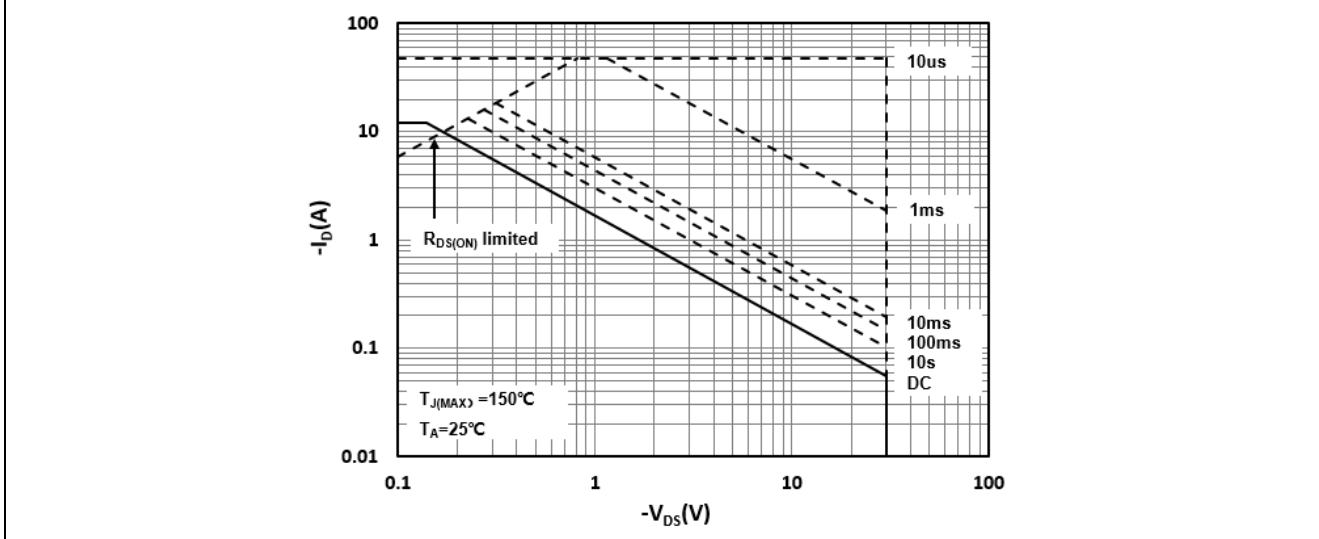
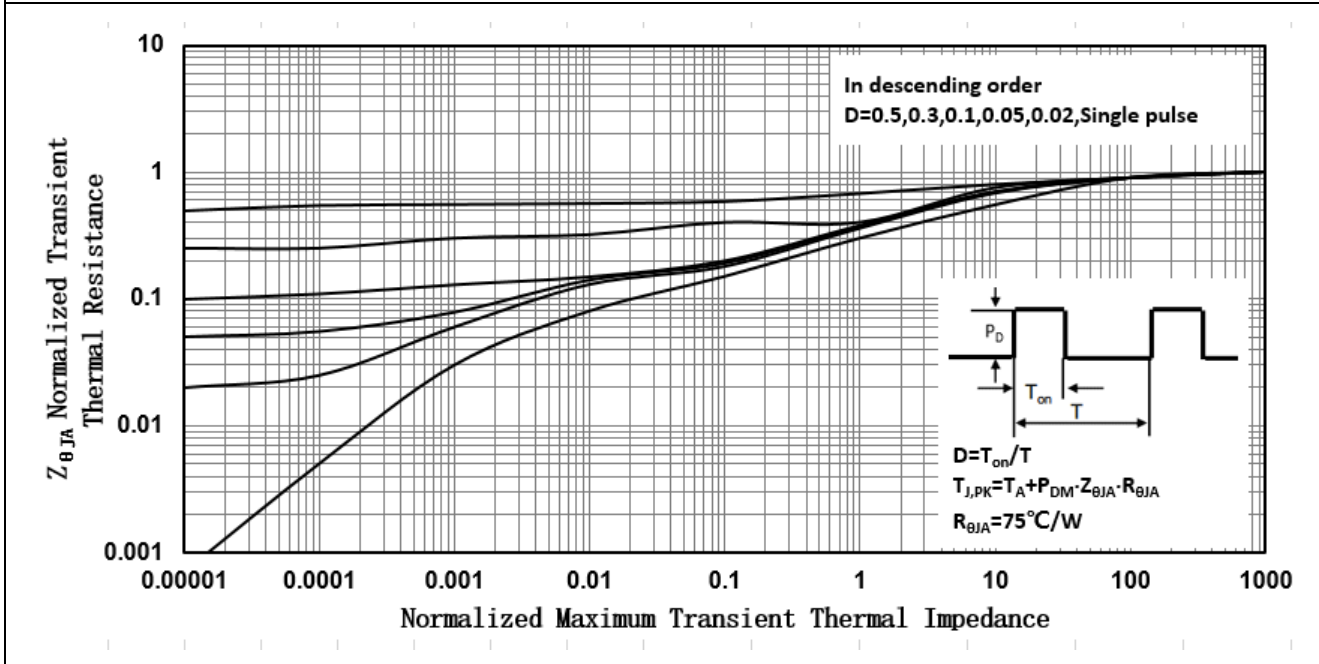
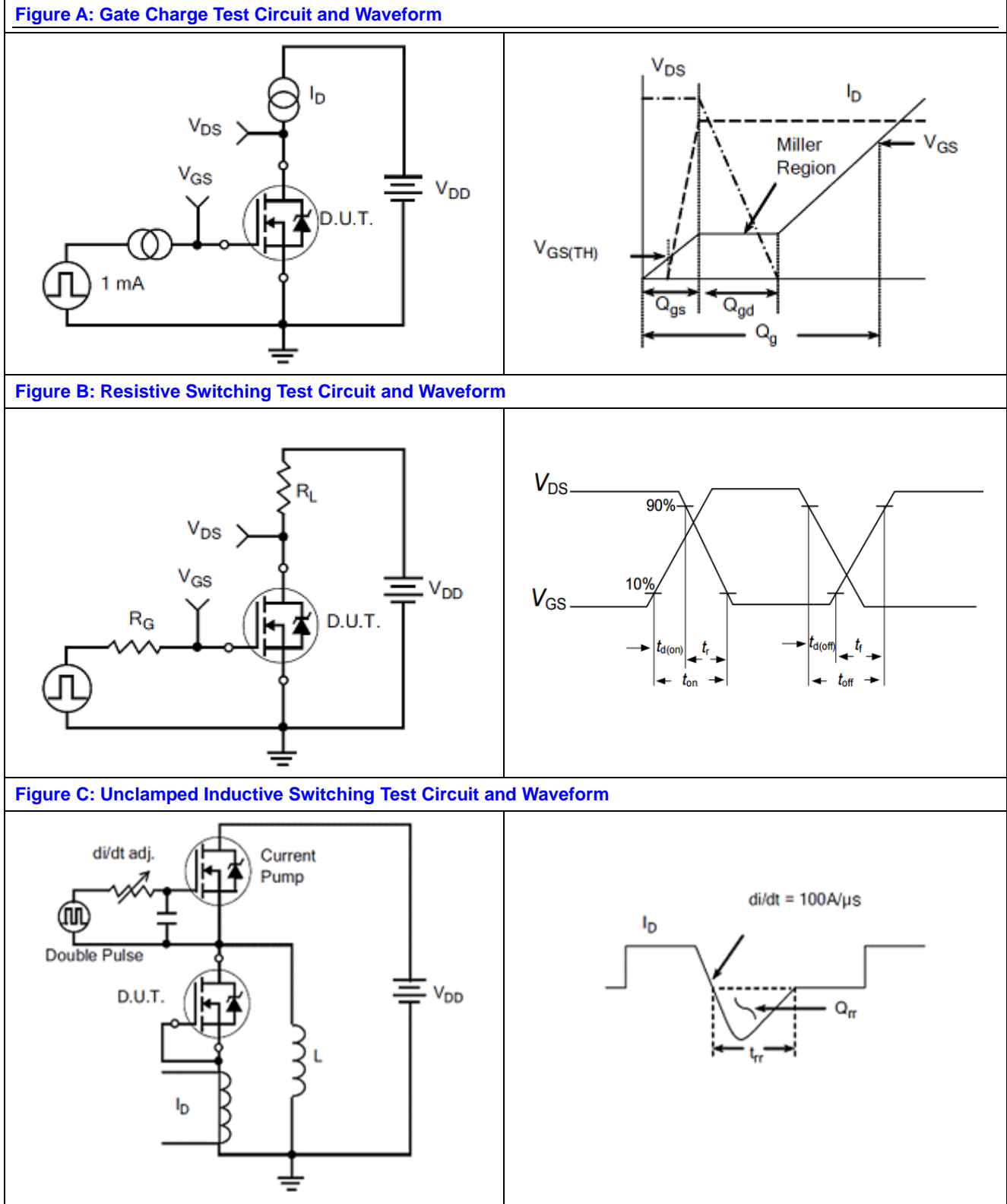


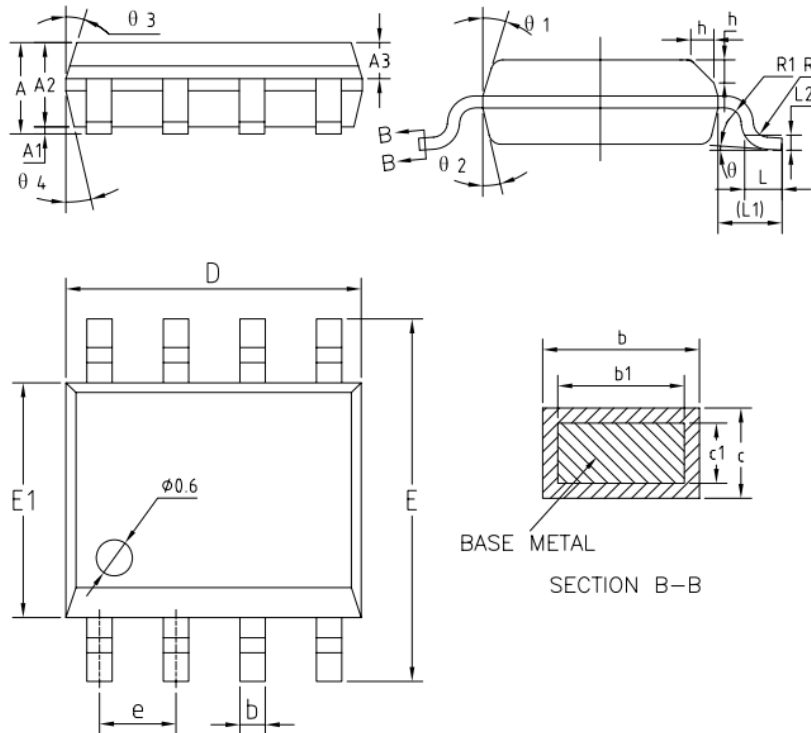
Figure 10 Transient Thermal Impedance



## Test Circuit and Waveform



## SOP-8 PACKAGE IN FORMATION



COMMON DIMENSIONS  
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	1.35	1.55	1.75
A1	0.10	0.15	0.25
A2	1.25	1.40	1.65
A3	0.50	0.60	0.70
b	0.38	—	0.51
b1	0.37	0.42	0.47
c	0.18	—	0.25
c1	0.17	0.20	0.23
D	4.80	4.90	5.00
E	5.80	6.00	6.20
E1	3.80	3.90	4.00
e	1.17	1.27	1.37
L	0.45	0.60	0.80
L1	1.04REF		
L2	0.25BSC		
R	0.07	—	—
R1	0.07	—	—
h	0.30	0.40	0.50
θ	0°	—	8°
θ 1	15°	17°	19°
θ 2	11°	13°	15°
θ 3	15°	17°	19°
θ 4	11°	13°	15°

**NOTE:**

1. Exceeding the maximum ratings of the device in performance may cause damage to the device, even the permanent failure, which may affect the dependability of the machine. Please do not exceed the absolute maximum ratings of the device when circuit designing.
2. When installing the heat sink, please pay attention to the torsional moment and the smoothness of the heat sink.
3. MOSFETs is the device which is sensitive to the static electricity, it is necessary to protect the device from being damaged by the static electricity when using it.
4. Shanghai Belling reserves the right to make changes in this specification sheet and is subject to change without prior notice.

**CONTACT:**

**上海贝岭股份有限公司 (总部)**

地址: 上海市宜山路 810 号

邮编: 200233

电话: 021-24261000

**产品业务咨询及技术支持**

电话: 021-24261326

传真 2: 021-64852222

邮箱 2: marketing@belling.com.cn

**上海贝岭深圳分公司 (华南区)**

地址: 深圳市福田区中心区民田路新华保险大厦 1510 室

邮编: 518031

电话: 0755-33336776 0755-33336770

传真: 0755-33336788

**上海贝岭北京办事处 (华北区)**

地址: 北京市西城区新华里 16 号院锦官苑小区 10 号楼 1 单元 1505 室

邮编: 100044

电话: 010-64179374

传真: 010-8835 9236