

P-Channel Enhancement Mode Power MOSFET

DESCRIPTION

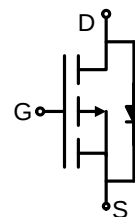
The BLM4407 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V.

GENERAL FEATURES

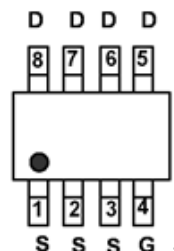
- $V_{DS} = -30V, I_D = -12A$
 $R_{DS(ON)} < 25m\Omega @ V_{GS} = -4.5V$
 $R_{DS(ON)} < 15m\Omega @ V_{GS} = -10V$
- High Power and current handling capability
- Lead free product is acquired
- Surface Mount Package

Application

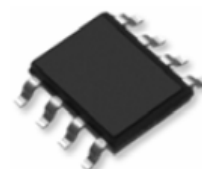
- Battery Switch
- Load Switch
- Power Management



Schematic diagram



Marking and pin Assignment



SOP-8 top view

Package Marking And Ordering Information

Device Marking	Ordering Codes	Package	Product Code	Packing
M4407	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}	± 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	$^\circ C/W$
---	-----------------	----	--------------

Electrical Characteristics (TA=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V I _D =-250μA	-30	-33	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-30V, V _{GS} =0V	-	-	-1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
On Characteristics						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-1	-1.5	-3	V
Drain-Source On-State Resistance (Note 3)	R _{DS(ON)}	V _{GS} =-10V, I _D =-6A	-	11.5	15	mΩ
		V _{GS} =-4.5V, I _D =-6A	-	18	25	mΩ
Forward Transconductance	g _{FS}	V _{DS} =-10V, I _D =-12A	16	-	-	S
Dynamic Characteristics						
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
Switching Characteristics						
Turn-on Delay Time	t _{d(on)}	V _{DD} =-15V, I _D =-12A, V _{GS} =-10V, R _{GEN} =1Ω	-	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
Drain-Source Diode Characteristics						
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. $I_{AS} = -34A, V_{DD} = -30V, R_G = 25\Omega$, Starting $T_j = 25^\circ C$.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.

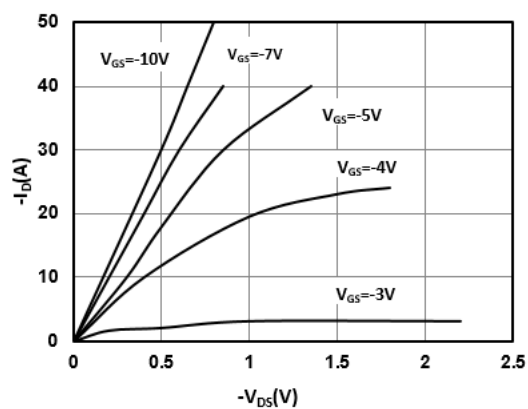
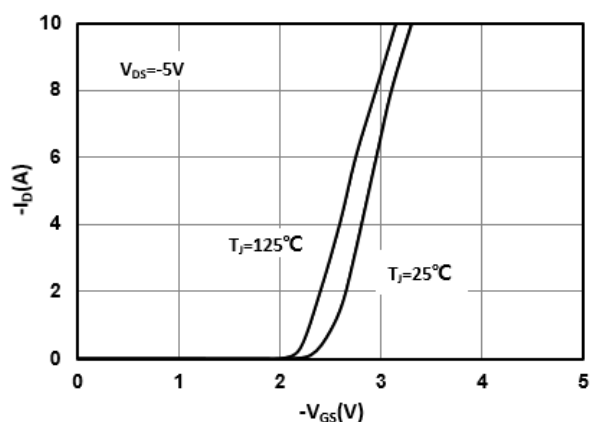
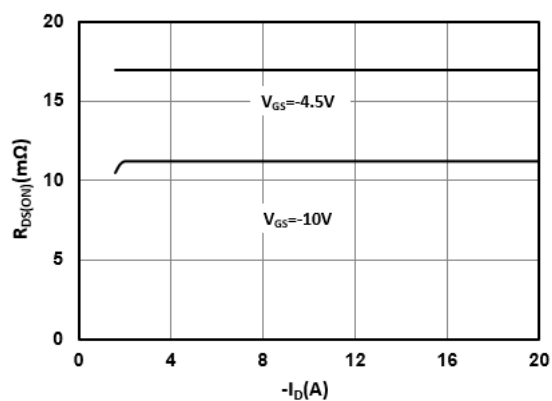
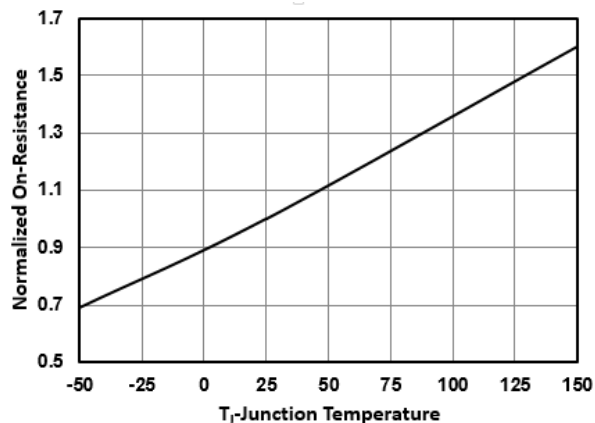
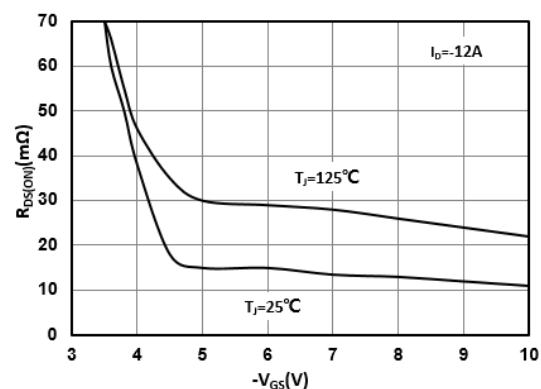
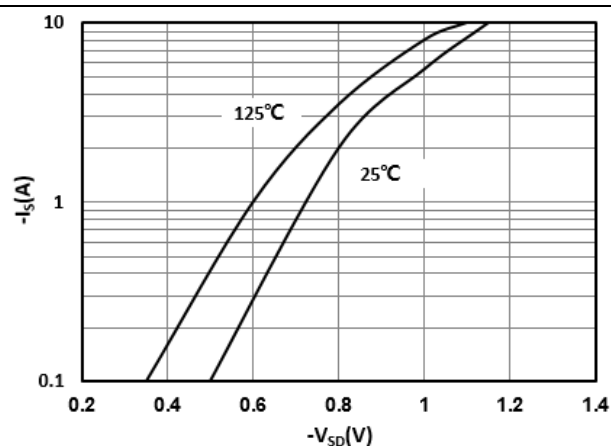
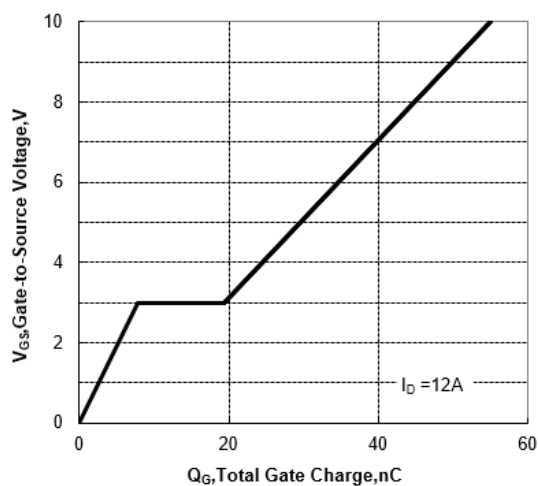
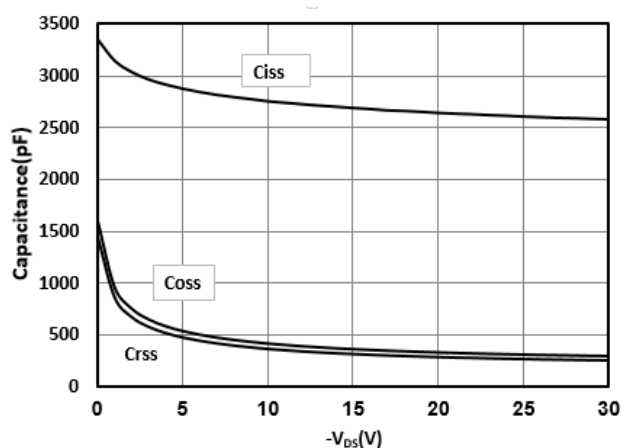
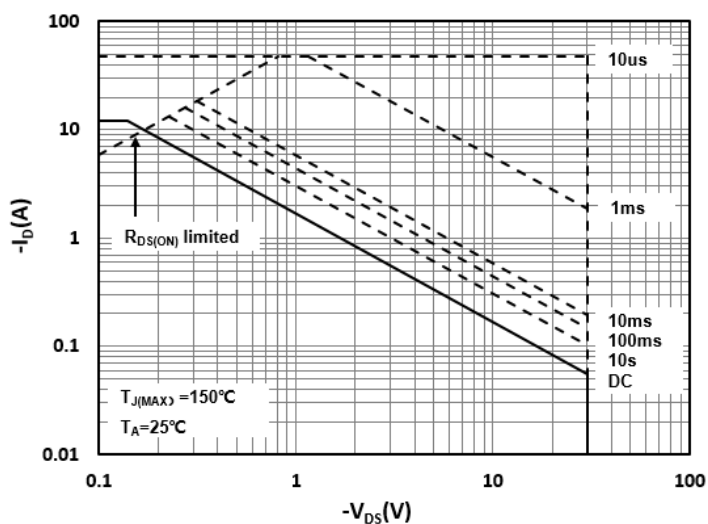
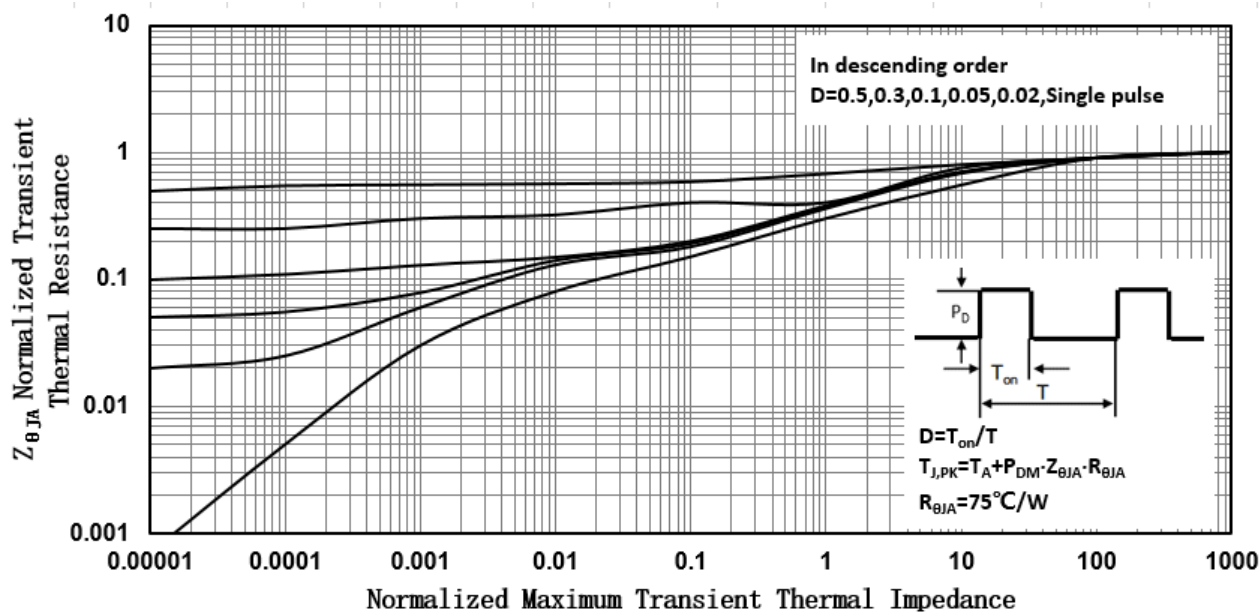
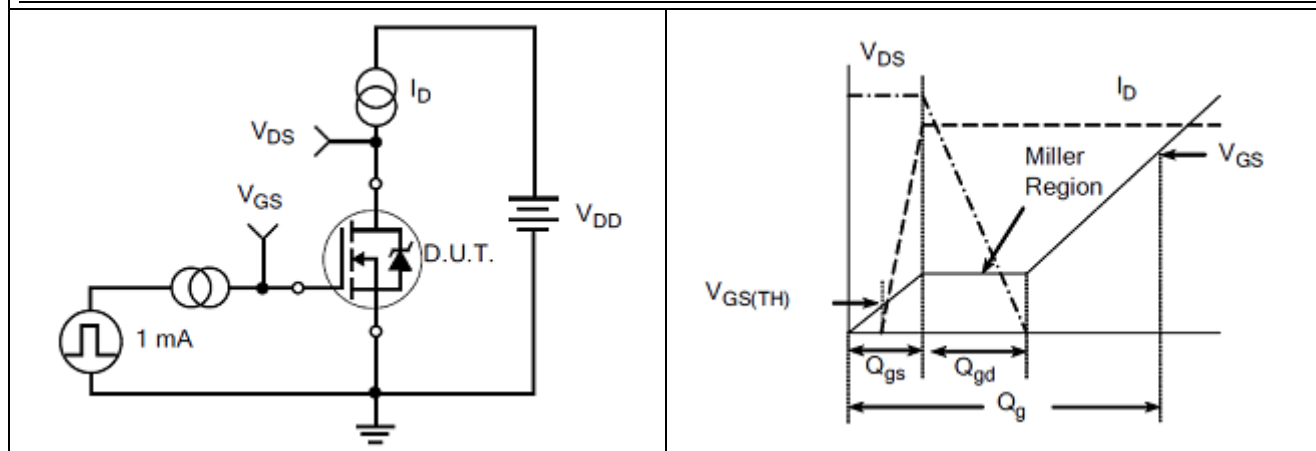
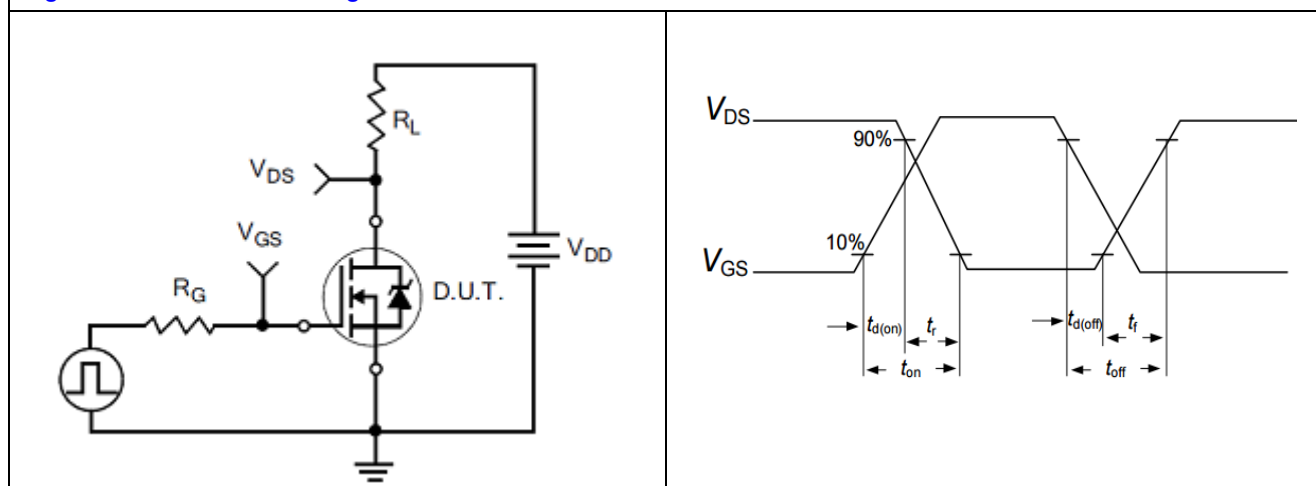
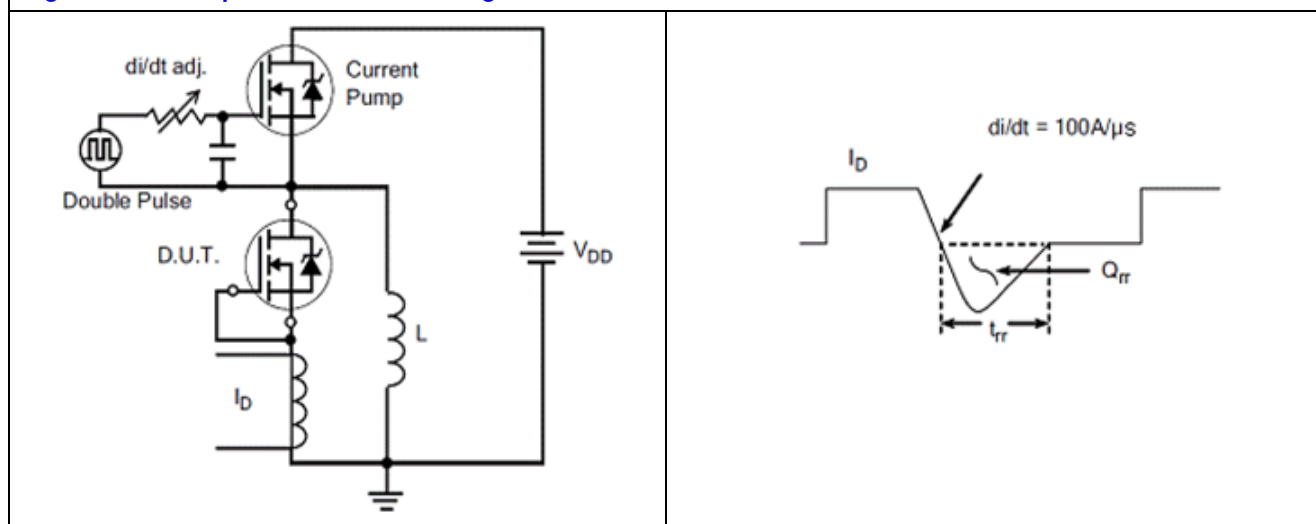
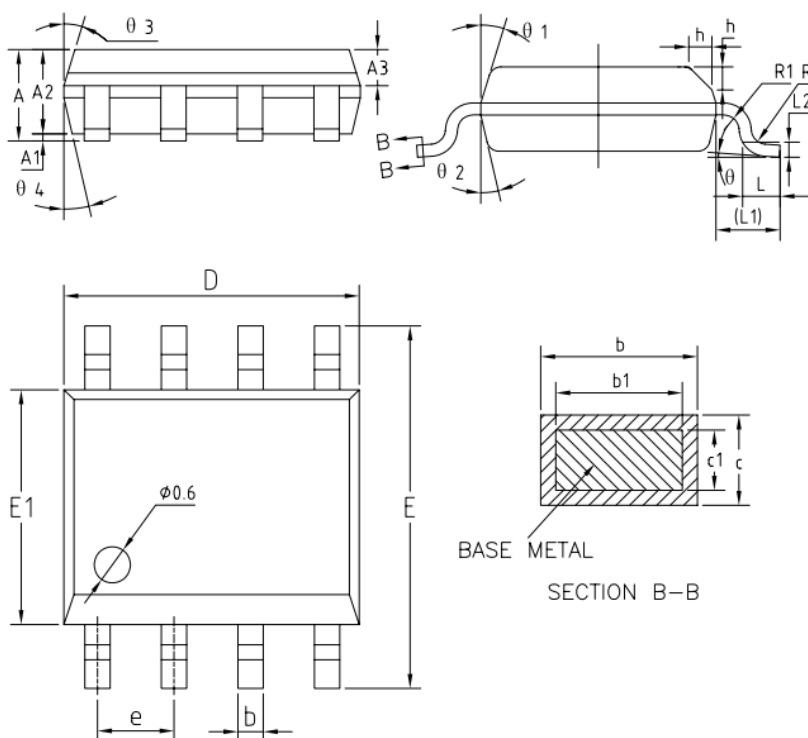
Characteristics Curves
Figure 1 Output Characteristics

Figure 2 Transfer Characteristics

Figure 3 On-Resistance vs. I_D and V_{GS}

Figure 4 On-Resistance vs. Junction Temperature

Figure 5 On-Resistance vs. V_{GS}

Figure 6 Body Diode Forward Voltage


Figure 7 Gate-Charge Characteristics

Figure 8 Capacitance Characteristics

Figure 9 Safe Operation Area

Figure 10 Transient Thermal Impedance


Test Circuit and Waveform

Figure A: Gate Charge Test Circuit and Waveform

Figure B: Resistive Switching Test Circuit and Waveform

Figure C: Unclamped Inductive Switching 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°
$\theta 1$	15°	17°	19°
$\theta 2$	11°	13°	15°
$\theta 3$	15°	17°	19°
$\theta 4$	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