

1. Description

BLG3040 is obtained by advanced ignition IGBTs technology which reduce the conduction loss, enhance the SCIS capability and internal diodes provide voltage clamping without the need for external components. The IGBT is suitable device for automotive ignition circuits, specifically as a coil driver.

KEY CHARACTERISTICS

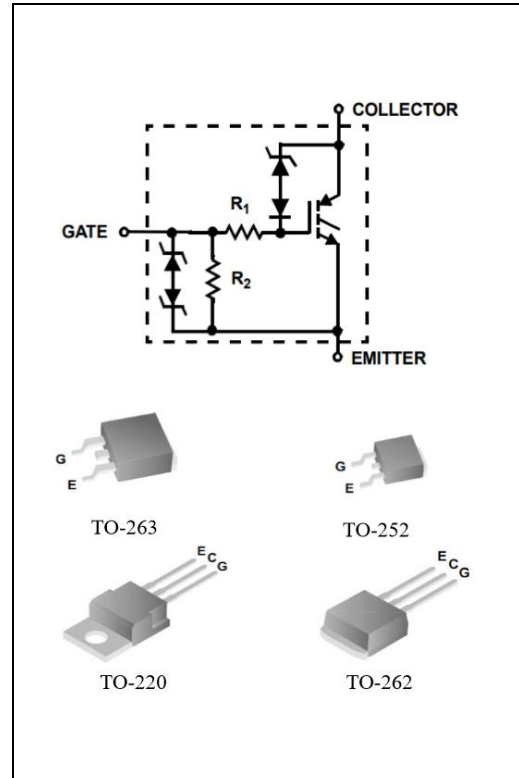
Parameter	Value	Unit
V_{CES}	400	V
$V_{CE(sat).Typ}$	1.25	V
SCIS	300	mJ
ESD	4	KV

FEATURES

- Low V_{CEsat}
- High SCIS Energy
- Positive temperature coefficient
- Logic Level Gate Drive

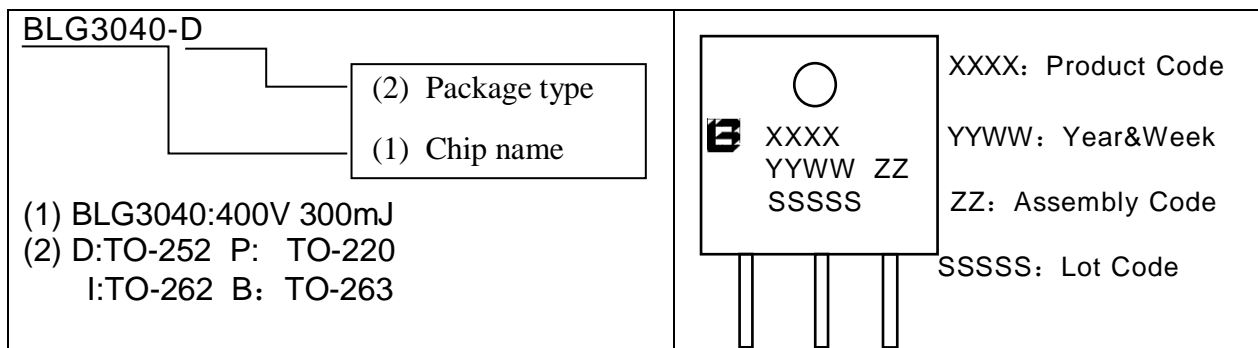
APPLICATIONS

- Automotive ignition Coil Driver Circuits
- Coil-On Plug Application



ORDERING INFORMATION

Ordering Codes	Package	Product Code	Packing
BLG3040-D	TO-252	G3040	Tape Reel
BLG3040-P	TO-220		Tube
BLG3040-I	TO-262		Tube
BLG3040-B	TO-263		Tape Reel



2. ABSOLUTE RATINGS

at $T_C = 25^\circ\text{C}$, unless otherwise specified

Symbol	Parameter	Rating	Units
V_{CES}	Collector-Emitter Voltage ($I_C = 1\text{mA}$)	430	V
V_{ECS}	Emitter to Collector Voltage ($I_C = 10\text{mA}$)	24	V
E_{SCIS}	SCIS Energy @ $T_J = 25^\circ\text{C}$, $I_{SCIS} = 14.2\text{A}$	300	mJ
	SCIS Energy @ $T_J = 150^\circ\text{C}$, $I_{SCIS} = 10.6\text{A}$	170	mJ
I_C	Collector Current @ $T_C = 25^\circ\text{C}$	21	A
	Collector Current @ $T_C = 100^\circ\text{C}$	17	A
ESD	Electrostatic Discharge Voltage (HBM)	4	KV
V_{GEM}	Gate- Emitter Voltage Continuous	± 10	V
P_D	Power Dissipation @ $T_C = 25^\circ\text{C}$	150	W
T_J, T_{stg}	Operating Junction and Storage Temperature Range	-40 to 175	$^\circ\text{C}$
T_L	Maximum Temperature for Soldering	260	$^\circ\text{C}$

3. Thermal characteristics

Symbol	Parameter	RATINGS	Units
$R_{\theta JC}$	Junction-to-Case	1	$^\circ\text{C}/\text{W}$

4. Electrical Characteristics

at $T_C = 25^\circ\text{C}$, unless otherwise specified

OFF Characteristics						
Symbol	Parameter	Test Conditions	Values			Units
			Min.	Typ.	Max.	
BV_{CER}	Collector to Emitter Breakdown Voltage	$V_{GE} = 0\text{V}$, $I_C = 2\text{mA}$ $R_G = 1\text{K}\Omega$	370	400	430	V
BV_{CES}	Collector to Emitter Breakdown Voltage	$V_{GE} = 0\text{V}$, $I_C = 10\text{mA}$ $R_G = 0\Omega$	390	420	450	v
BV_{ECS}	Emitter to Collector Breakdown Voltage	$V_{GE} = 0\text{V}$, $I_C = -75\text{mA}$	30			V
BV_{GES}	Gate to Emitter Breakdown Voltage	$I_{GES} = \pm 2\text{mA}$	± 12	± 14		V

I _{CER}	Collector to Emitter Leakage Current	V _{CE} = 250V, R _G = 1KΩ, T _J = 25°C	--	--	25	μA
		V _{CE} = 250V, R _G = 1KΩ, T _J = 150°C			1	mA
I _{ECS}	Emitter to Collector Leakage Current	V _{EC} = 24V, T _J = 25°C	--	--	1	mA
		V _{EC} = 24V, T _J = 150°C			40	mA
R1	Series Gate Resistance		--	70		Ω
R2	Gate to Emitter Resistance		10		26	KΩ

ON Characteristics

Symbol	Parameter	Test Conditions	Values			Units
			Min.	Typ.	Max.	
V _{CE(sat)}	Collector-Emitter Saturation Voltage	V _{GE} = 4V, I _C = 6A	--	1.25	1.6	V
V _{CE(sat)}	Collector-Emitter Saturation Voltage	V _{GE} = 4.5V, I _C = 10A	--	1.5	1.8	V
V _{CE(sat)}	Collector-Emitter Saturation Voltage	V _{GE} = 4.5V, I _C = 15A	--	1.9	2.2	V
V _{GE(TH)}	Gate Threshold Voltage	V _{CE} = V _{GE} , I _C = 1mA	1.3	--	2.2	V

Pulse width $t_p \leq 300 \mu s$, $\delta \leq 2\%$

Dynamic Characteristics

Symbol	Parameter	Test Conditions	Values			Units
			Min.	Typ.	Max.	
C _{iss}	Input Capacitance	V _{GE} = 0V V _{CE} = 25V f = 1.0MHz	--	900	--	pF
C _{oss}	Output Capacitance		--	75	--	
C _{rss}	Reverse Transfer Capacitance		--	16	--	
Q _g	Total Gate Charge	I _C = 10A V _{CE} = 12V V _{GE} = 5V	--	8	--	nC

Switching Characteristics

Symbol	Parameter	Test Conditions	Values			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	$V_{CE} = 14V$ $V_{GE} = 5V$ $R_G = 1K\Omega$	--	0.6	4	us
t_r	Rise Time		--	2	7	
$t_{d(OFF)}$	Turn-Off Delay Time	$V_{CE} = 300V$ $V_{GE} = 5V$ $R_G = 1K\Omega$	--	5	15	
t_f	Fall Time		--	2	15	

5. Characteristics Curves

Figure 1 Collector-Emitter Saturation Voltage vs Junction Temperature

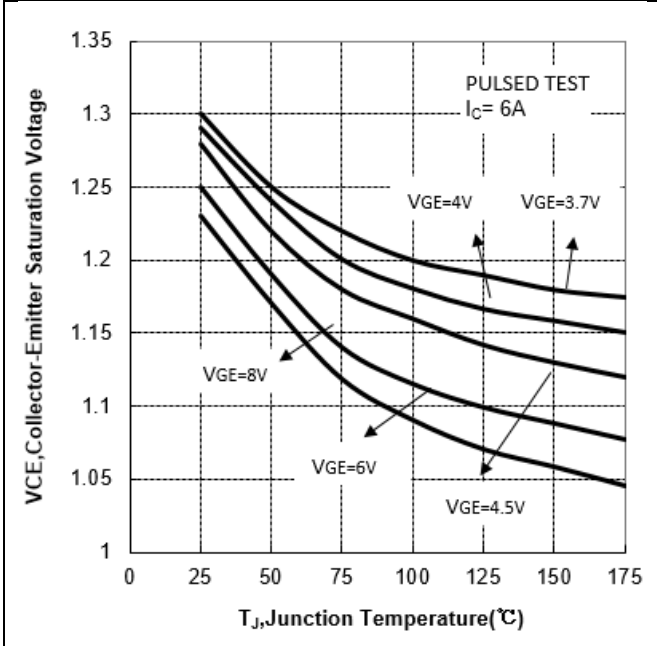


Figure 2 Collector-Emitter Saturation Voltage vs Junction Temperature

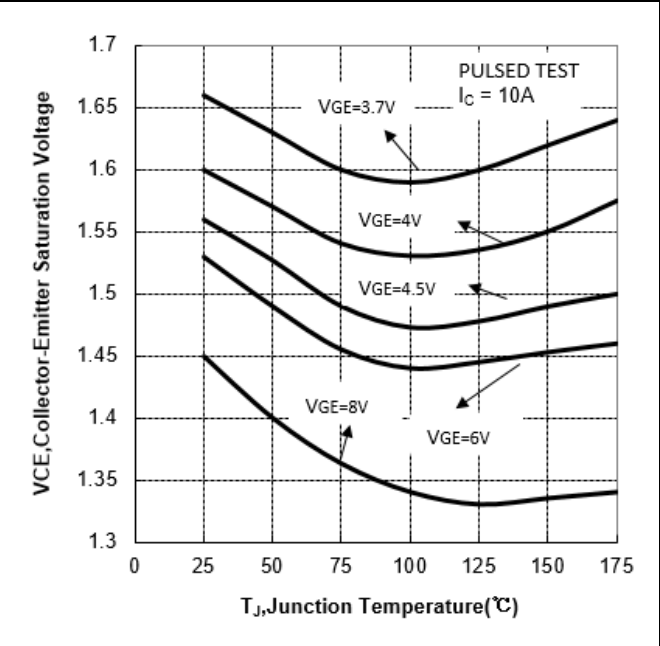


Figure 3 Collector-Emitter Voltage vs Collector Current

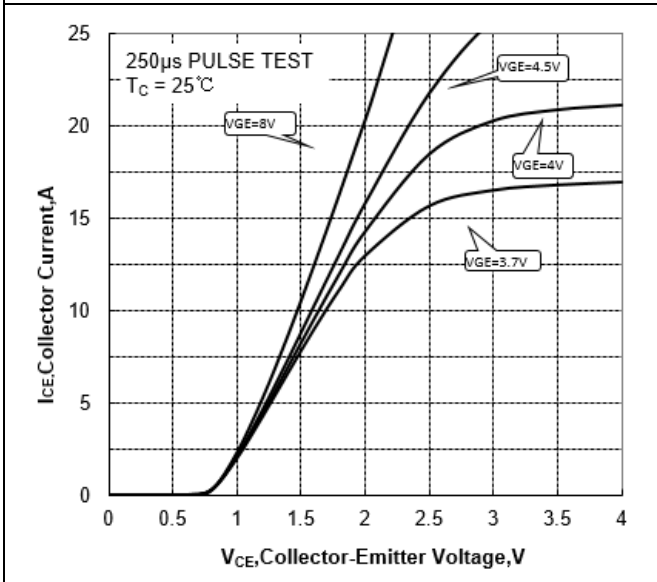


Figure 4 Collector-Emitter Voltage vs Collector Current

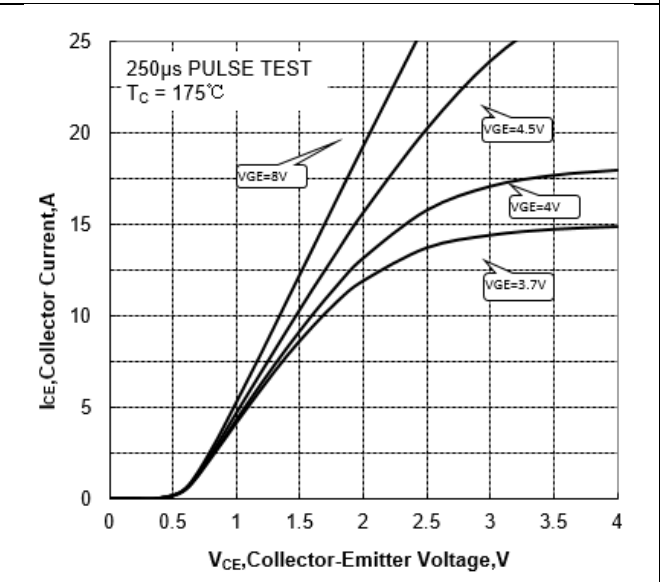


Figure 5 Collector-Emitter Voltage vs Collector Current

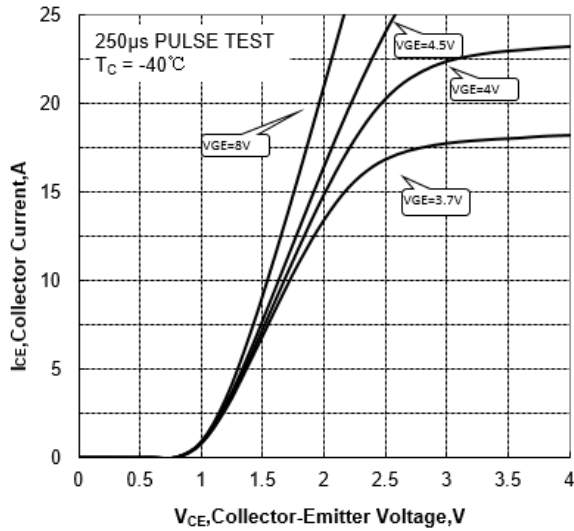


Figure 6 Switching Time vs Junction Temperature

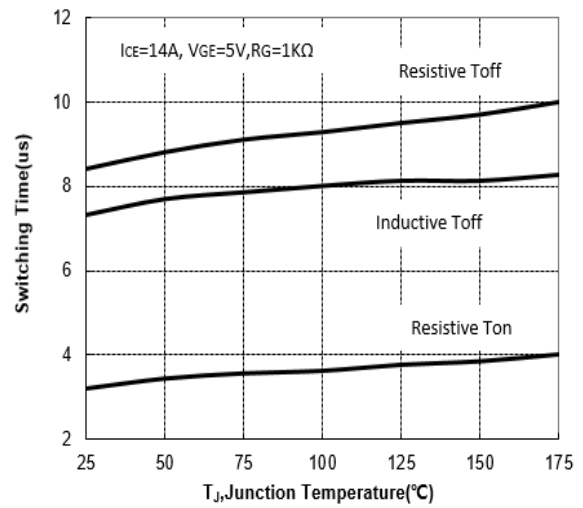


Figure 7 Typical Transfer Characteristics

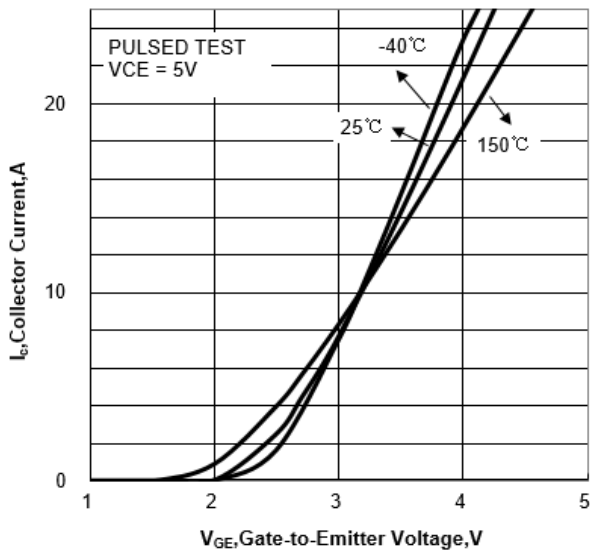


Figure 8 Threshold Voltage vs Junction Temperature

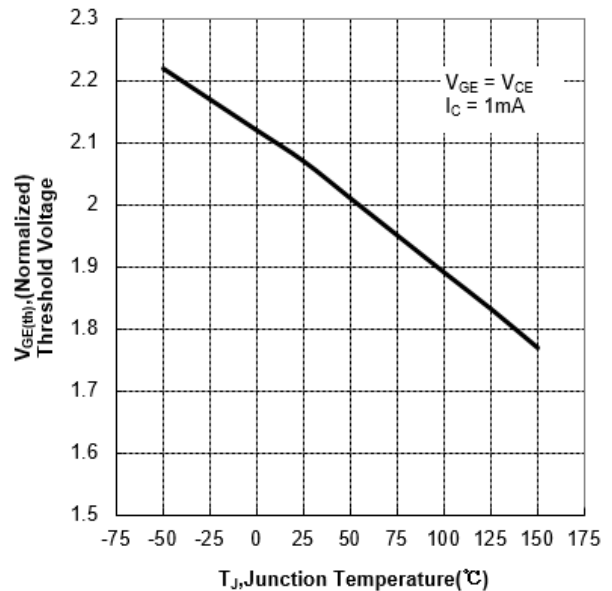


Figure 9 Leakage Current vs Junction Temperature

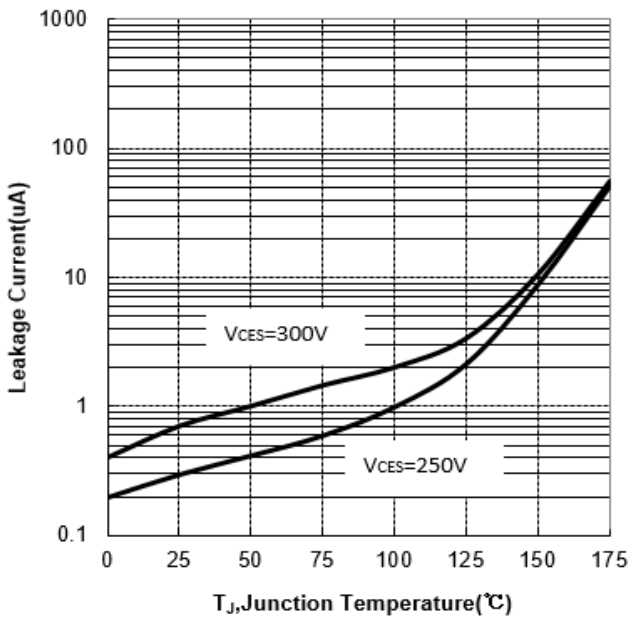


Figure 10 Breakdown Voltage vs Series Gate Resistance

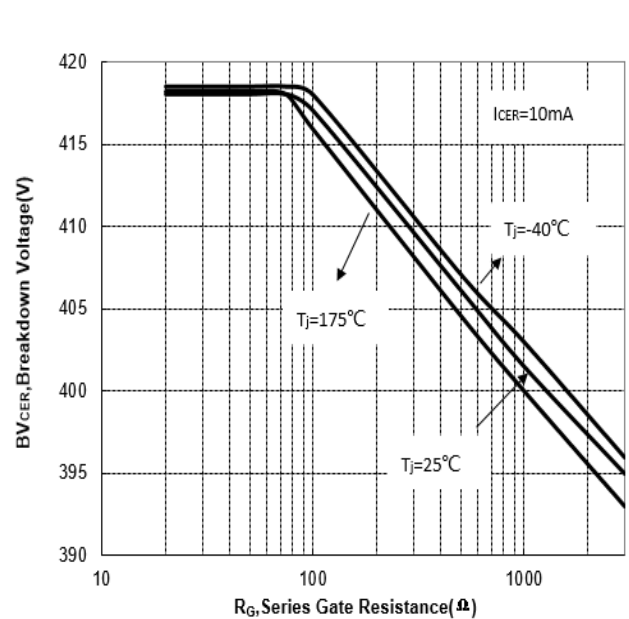


Figure 11 Typical Capacitance vs Collector-Emitter Voltage

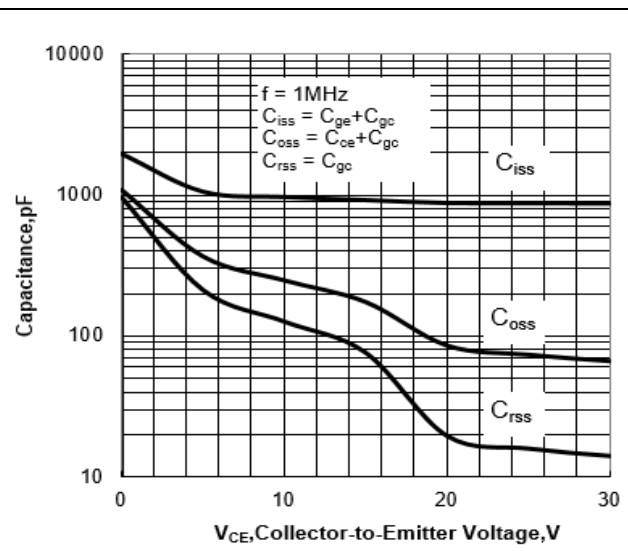


Figure 12 Typical Gate charge

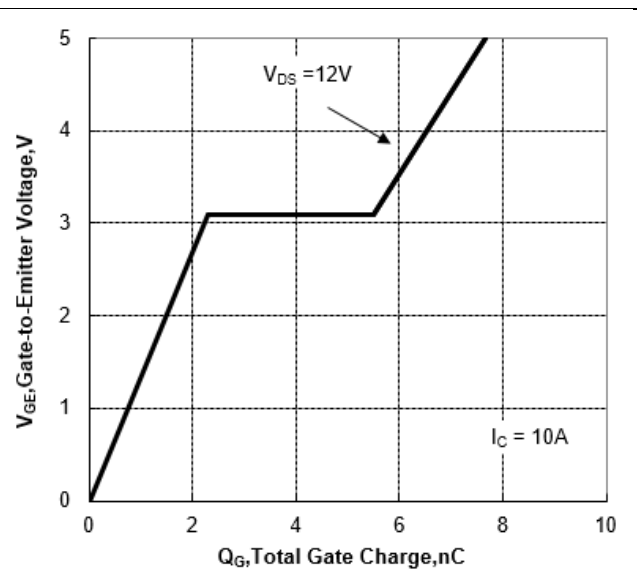


Figure 13 Self Clamped Inductive Switching Current vs Inductance

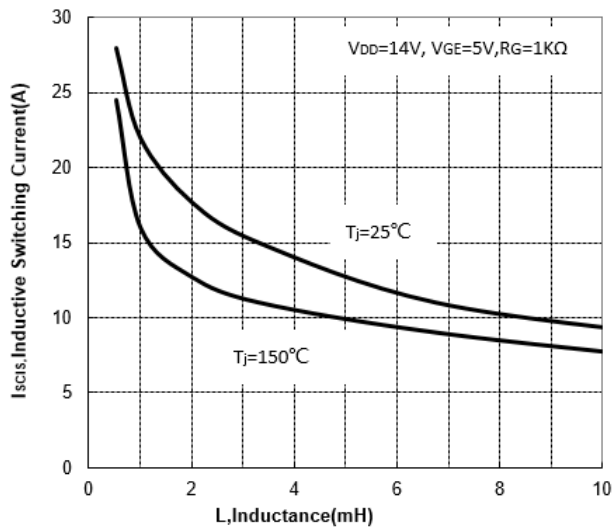


Figure 14 Typical Switching Times vs Time in Clamp

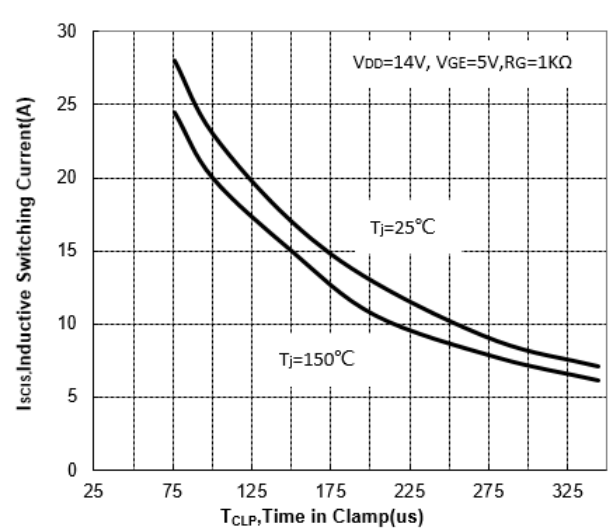
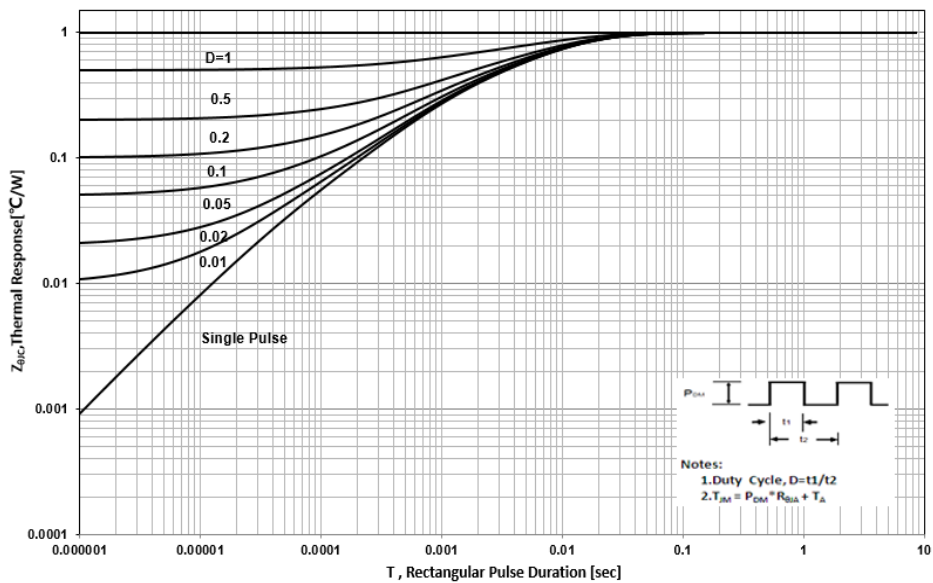


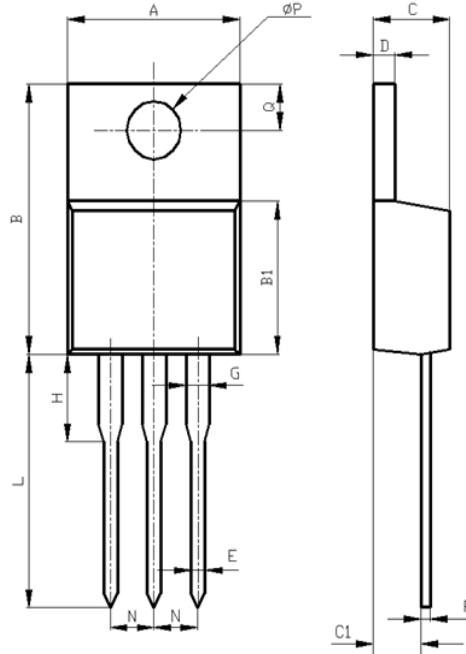
Figure 15 Max Thermal Impedance



6. Test Circuit and Waveform

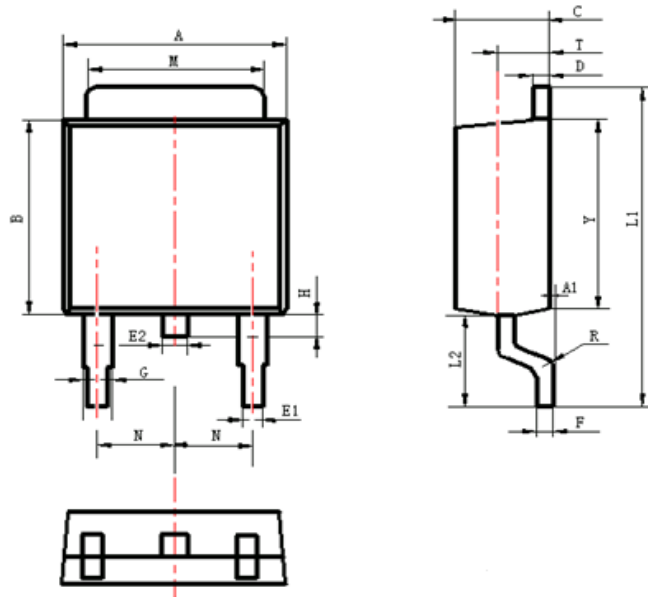
<p>Figure 16 Inductive Switching Test Circuit</p>	<p>Figure 17 Inductive Switching Waveforms</p>
<p>Figure 18 Inductive Switching Waveforms</p>	<p>Figure 19 Inductive Switching Waveforms</p>
<p>Figure 20 Energy Test Circuit</p>	<p>Figure 21 Energy Waveforms</p>

7. Package Description



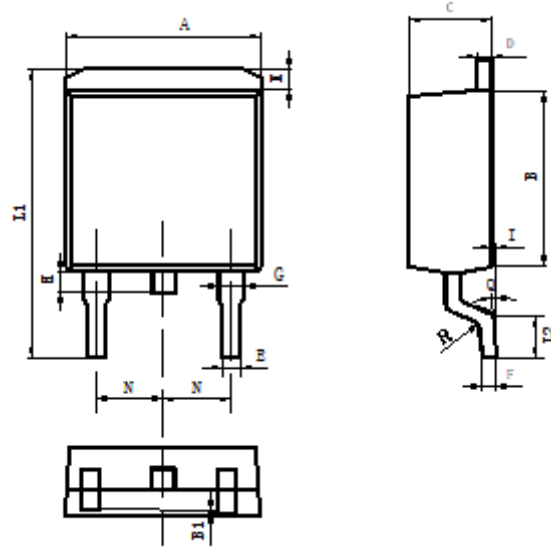
Items	Values(mm)	
	MIN	MAX
A	9.60	10.6
B	15.0	16.0
B1	8.90	9.50
C	4.30	4.80
C1	2.30	3.10
D	1.20	1.40
E	0.70	0.90
F	0.30	0.60
G	1.17	1.37
H	2.70	3.80
L	12.6	14.8
N	2.34	2.74
Q	2.40	3.00
φ P	3.50	3.90

TO-220 Package



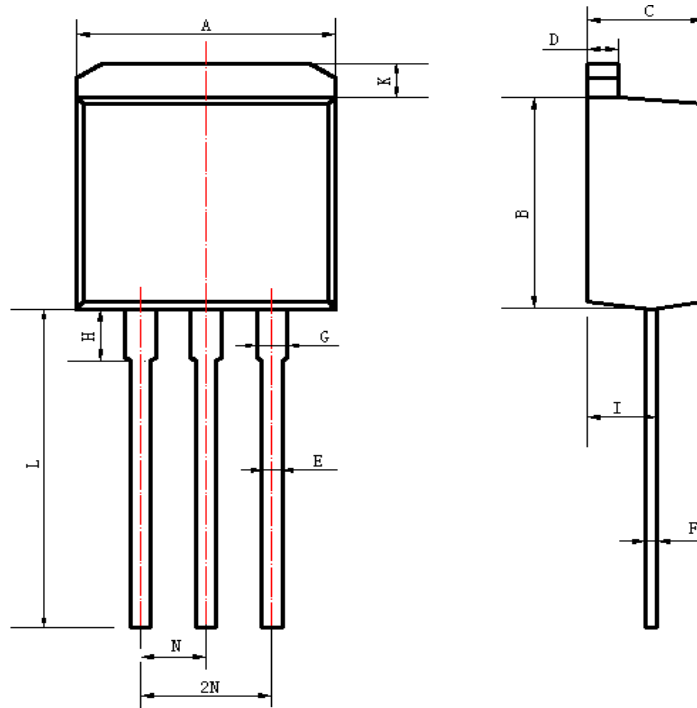
Items	Values(mm)	
	MIN	MAX
A	6.30	6.90
A1	0	0.13
B	5.70	6.30
C	2.10	2.50
D	0.30	0.60
E1	0.60	0.90
E2	0.70	1.00
F	0.30	0.60
G	0.70	1.20
L1	9.60	10.50
L2	2.70	3.10
H	0.60	1.00
M	5.10	5.50
N	2.09	2.49
T	1.40	1.60
Y	5.10	6.30

TO-252 Package



Items	Values(mm)	
	MIN	MAX
A	9.80	10.40
B	8.90	9.50
B1	0	0.10
C	4.40	4.80
D	1.16	1.37
E	0.70	0.95
F	0.30	0.60
G	1.07	1.47
H	1.30	1.80
K	0.95	1.37
L1	14.50	16.50
L2	1.60	2.30
I	0	0.2
Q	0°	8°
R	0.4	0.4
N	2.39	2.69

TO-263 Package



Items	Values(mm)	
	MIN	MAX
A	9.80	10.40
B	8.90	9.50
C	4.30	4.80
D	1.15	1.40
E	0.70	0.91
F	0.28	0.55
G	1.07	1.47
H	3.37	3.77
I	2.50	2.90
K	0.90	1.40
L	12.7	14.7
N	2.35	2.70

TO-262 Package

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