

## 1. Description

BLG15T65FUA is obtained by advanced Trench Field Stop (T-FS) technology which is characteristic in best trade-off of  $V_{CE(sat)}$  and  $E_{off}$ , optimized switching performance and low gate charge  $Q_g$ . The IGBT is suitable device for BLDC, UPS, and PFC.

### KEY CHARACTERISTICS

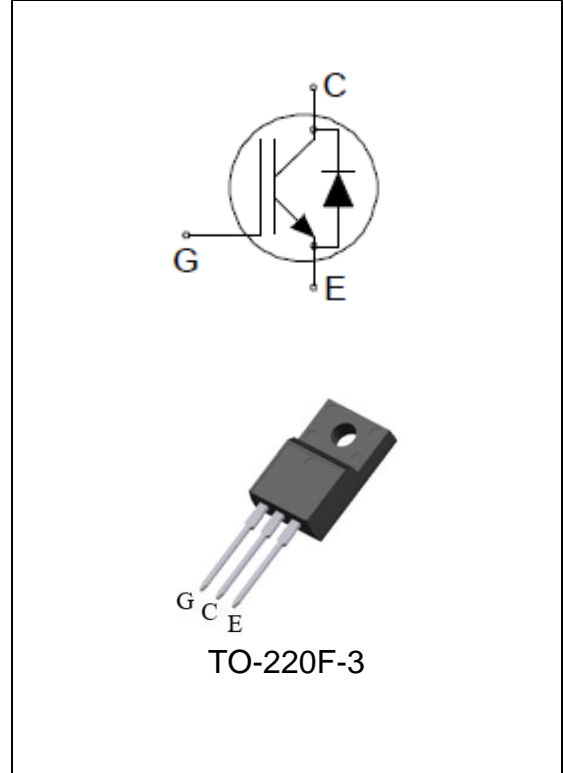
Parameter	Value	Unit
$V_{CES}$	650	V
$I_C$	15	A
$V_{CE(sat).typ}$	1.65	V
$P_D(T_C=25^\circ C)$	28	W

### FEATURES

- Fast Switching
- Low  $V_{CE(sat)}$
- Positive temperature coefficient
- Very soft, fast recovery anti-parallel diode
- RoHS product

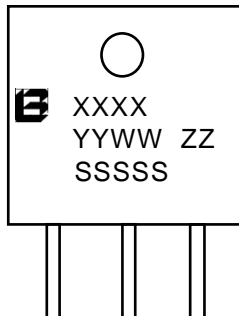
### APPLICATIONS

- UPS
- Air condition
- Motor drives
- PFC



## ORDERING INFORMATION

Ordering Codes	Package	Product Code	Packing
BLG15T65FUA-A	TO-220F	G1565FUA	Tube

<p>BLG15T65FUA-A</p> <div style="border: 1px solid black; padding: 5px; margin-left: 20px;">                 (2) Package type                  (1) Chip name             </div> <p>(1) BLG15T65FUA:650V 15A                  (2) A:TO-220F</p>	 <p>XXXX: Product Code                  YYWW: Year &amp; Week                  ZZ: Assembly Code                  SSSSS: Lot Code</p>
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## 2. ABSOLUTE RATINGS

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

Symbol	Parameter	Rating	Units
$V_{CES}$	Collector-Emitter Voltage	650	V
$I_C$	Collector Current @ $T_C=25^\circ\text{C}$	30	A
	Collector Current @ $T_C=100^\circ\text{C}$	15	A
$I_{CM}$	Pulsed Collector Current (Note1) @ $T_C=25^\circ\text{C}$	60	A
$I_F$	Diode Continuous Forward Current @ $T_C=25^\circ\text{C}$	30	A
	Diode Continuous Forward Current @ $T_C=100^\circ\text{C}$	15	A
$I_{FM}$	Diode Maximum Forward Current @ $T_C=25^\circ\text{C}$	60	A
$V_{GES}$	Gate-Emitter Voltage	$\pm 30$	V
$P_D$	Power Dissipation @ $T_C=25^\circ\text{C}$	28	W
$T_{Jmax}, T_{stg}$	Operating Junction and Storage Temperature Range	150, -55 to 150	$^\circ\text{C}$
$T_L$	Maximum Temperature for Soldering	270	$^\circ\text{C}$

## 3. Thermal characteristics

Symbol	Parameter	RATINGS	Units
$R_{\theta JC}$	Junction-to-Case (IGBT)	4.4	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Junction-to-Case (Diode)	6.5	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Junction-to-Ambient	62.5	$^\circ\text{C}/\text{W}$

## 4. Electrical Characteristics

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

OFF Characteristics						
Symbol	Parameter	Test Conditions	Values			Units
			Min.	Typ.	Max.	
$V_{CES}$	Collector-Emitter Breakdown Voltage	$V_{GE} = 0\text{V}$ , $I_C = 250\mu\text{A}$	650	--	--	V
$I_{CES}$	Collector-Emitter Leakage Current	$V_{CE} = 650\text{V}$ , $V_{GE} = 0\text{V}$	--	--	4	$\mu\text{A}$
$I_{GES(F)}$	Gate-Emitter Leakage Current	$V_{GE} = +30\text{V}$	--	--	200	nA
$I_{GES(R)}$	Gate-Emitter Reverse Leakage	$V_{GE} = -30\text{V}$	--	--	-200	nA

### ON Characteristics

Symbol	Parameter	Test Conditions	Values			Units
			Min.	Typ.	Max.	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$V_{GE} = 15V$ , $I_C = 15A$	--	1.6	2.0	V
$V_{GE(TH)}$	Gate Threshold Voltage	$V_{CE} = V_{GE}$ , $I_C = 1mA$	4.5	5.2	6.0	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	$V_{GE}=0V$ $V_{CE}=25V$ $f=1.0MHz$	--	925	--	pF
$C_{oss}$	Output Capacitance		--	45	--	
$C_{rss}$	Reverse Transfer Capacitance		--	9	--	
$Q_g$	Total Gate Charge	$I_C=15A$ $V_{CE}=520V$ $V_{GE}=15V$	--	39	--	nC

### Switching Characteristics

Symbol	Parameter	Test Conditions	Values			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	$I_C = 15A$ $V_{CE} = 400V$ $V_{GE} = 15V$ $R_G = 10\Omega$ $T_J = 25^\circ C$ Inductive Load	--	13	--	ns
$t_r$	Rise Time		--	23	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	31	--	
$t_f$	Fall Time		--	85	--	
$E_{on}$	Turn-On Switching Loss		--	0.32	--	mJ
$E_{off}$	Turn-Off Switching Loss		--	0.20	--	
$E_{ts}$	Total Switching Loss		--	0.52	--	

### Diode Characteristics

Symbol	Parameter	Test Conditions	Values			Units
			Min.	Typ.	Max.	
$V_F$	Diode Forward Voltage	$I_F = 15A$	--	1.8	2.2	V
$T_{rr}$	Reverse Recovery Time	$I_F = 15A$ , $di/dt = 200A/\mu s$ , $T_J = 25^\circ C$	--	50	--	ns
$Q_{rr}$	Reverse Recovery Charge		--	105	--	nC
$I_{rrm}$	Reverse Recovery Current		--	4.0	--	A

Note1: Pulse width limited by maximum junction temperature

## 5. Characteristics Curves

Figure 1. Forward Bias Safe Operating Area

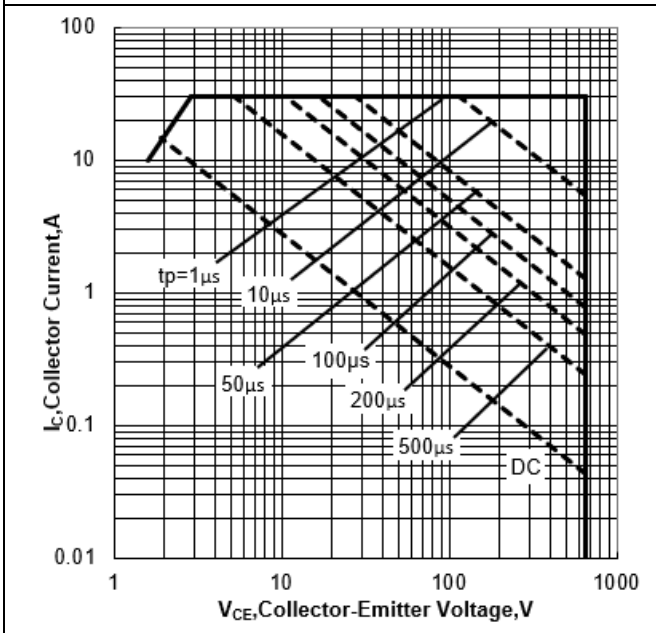


Figure 2. Power Dissipation vs Case Temperature

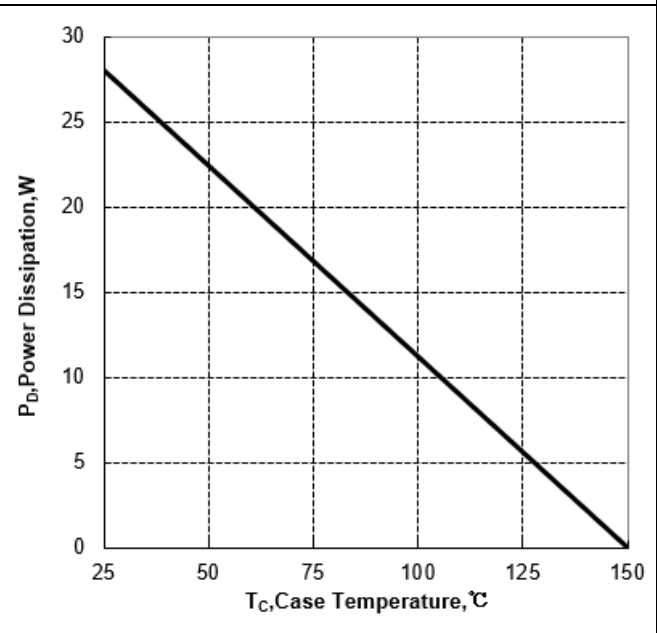


Figure 3. Collector Current vs Case Temperature

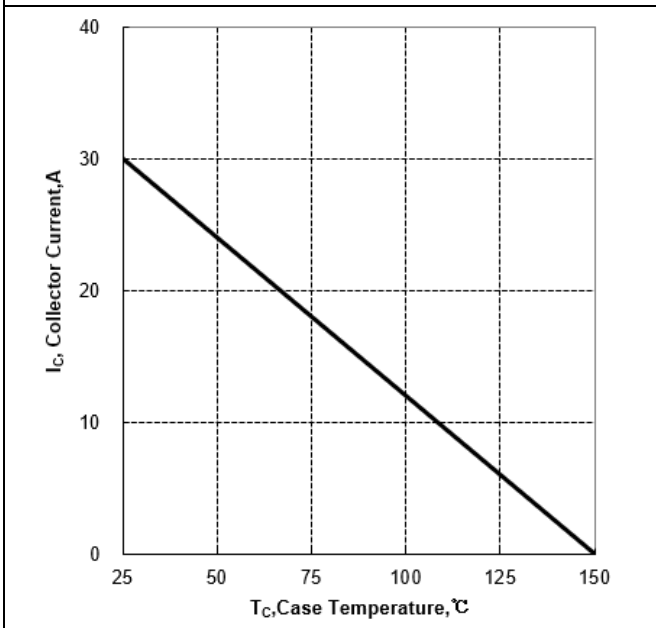
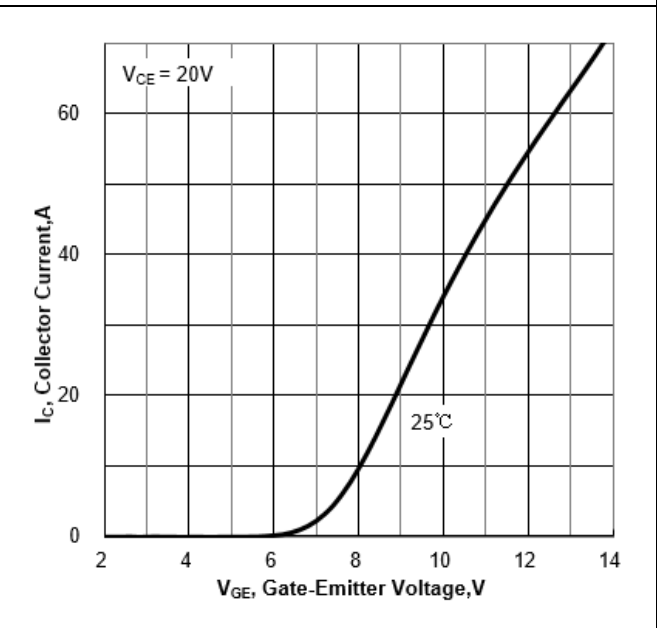
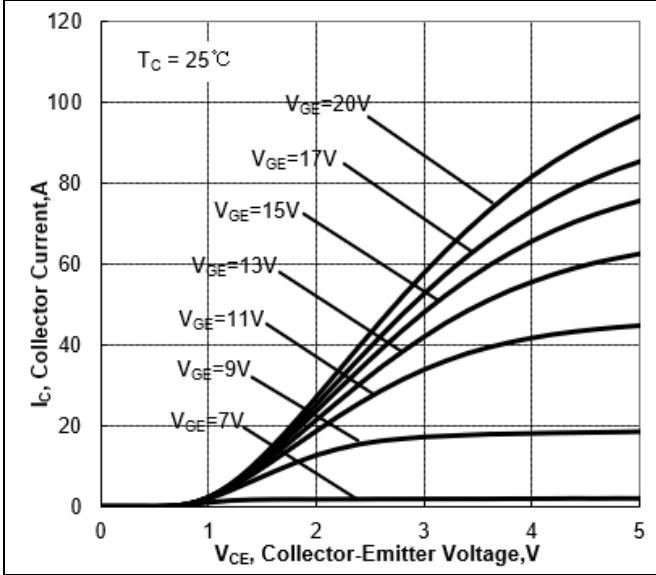


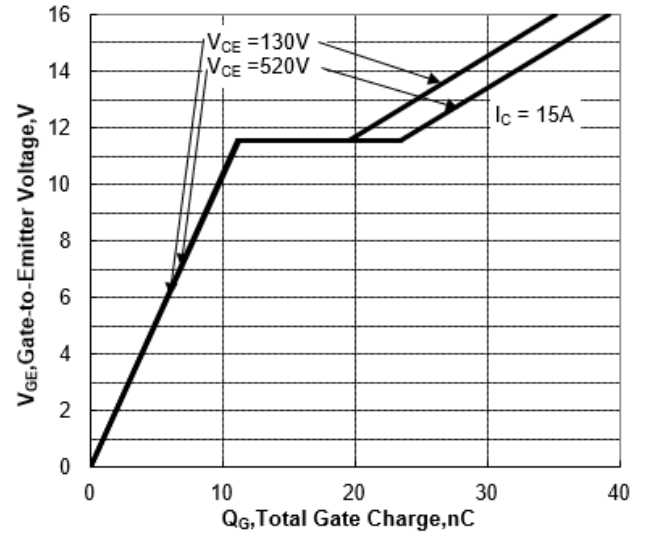
Figure 4. Typical Transfer Characteristics



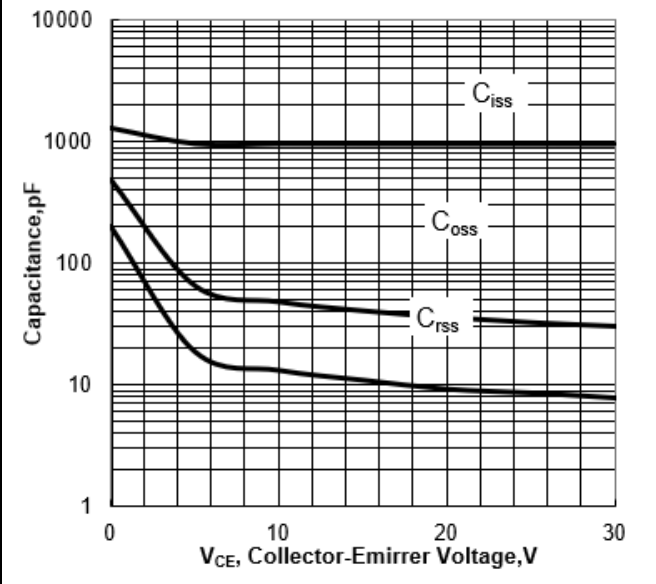
**Figure 5. Typical Output Characteristics( $T_C=25^\circ\text{C}$ )**



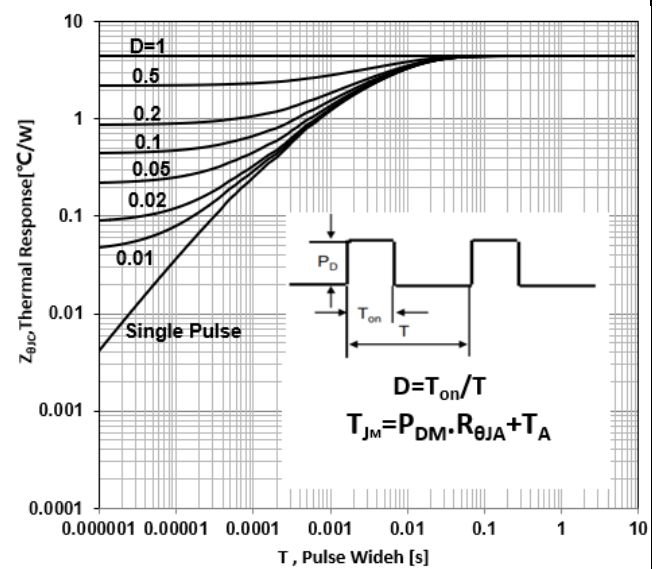
**Figure 6. Typical Gate Charge**



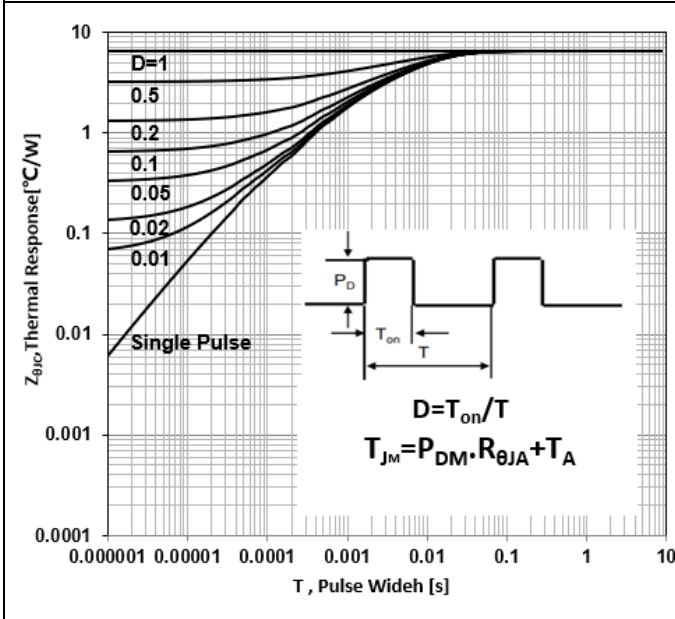
**Figure 7. Typical Capacitance vs Collector-Emitter Voltage**



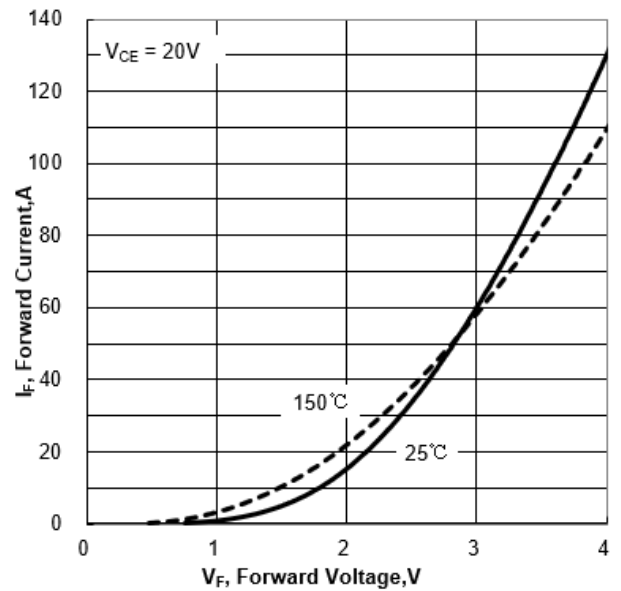
**Figure 8. IGBT Transient Thermal Impedance vs Pulse Width**



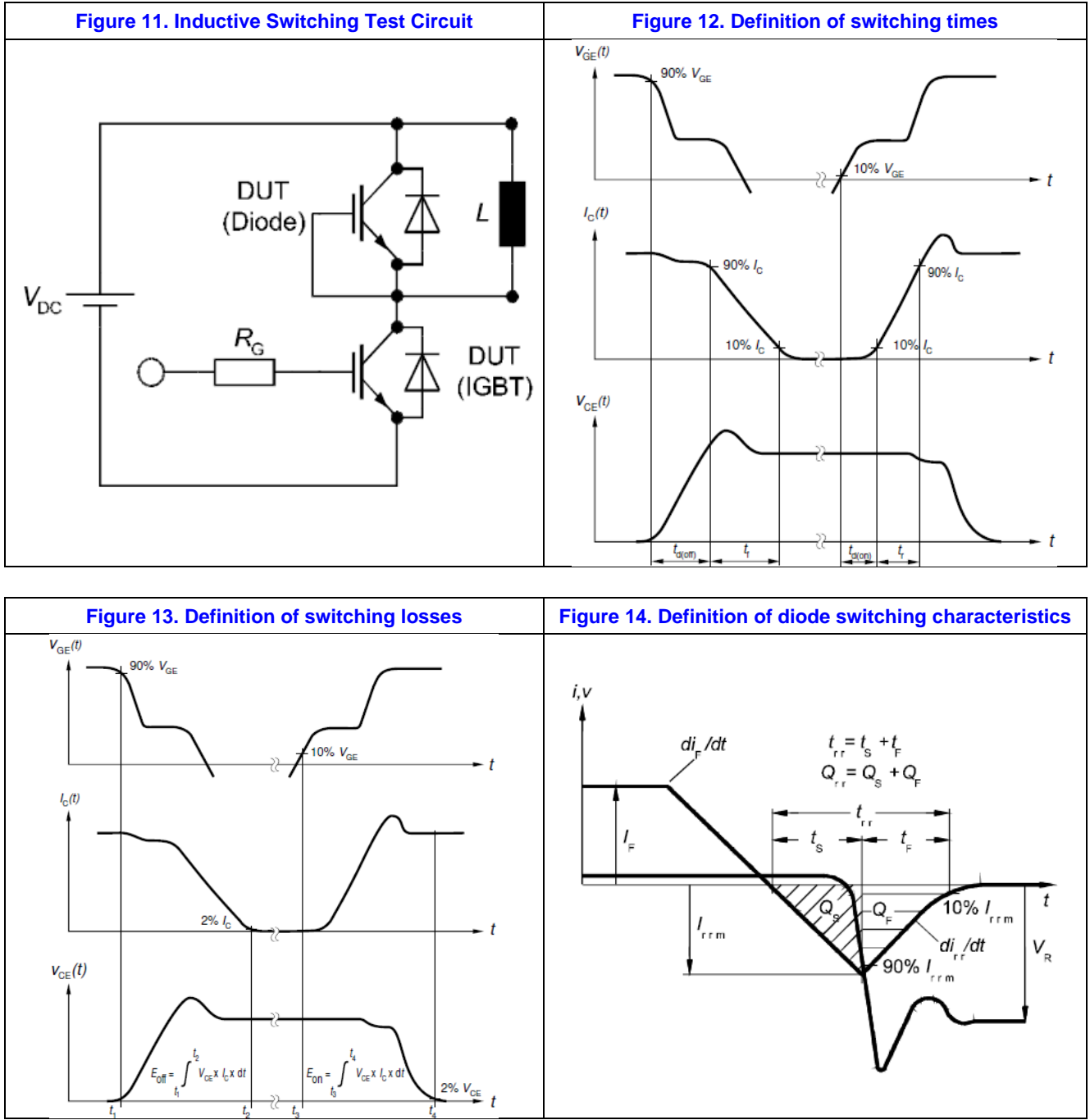
**Figure 9. Diode Transient Thermal Impedance vs Pulse Width**



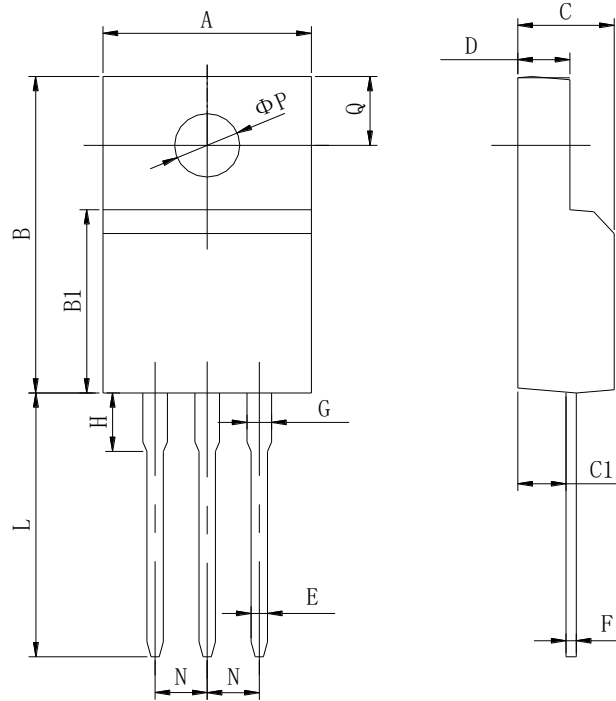
**Figure 10. Typical Diode Forward Current vs Forward Voltage**



## 6. Test Circuit and Waveform



## 7. Package Description



Items	Values(mm)	
	MIN	MAX
A	9.60	10.4
B	15.4	16.2
B1	8.90	9.50
C	4.30	4.90
C1	2.10	3.00
D	2.40	3.00
E	0.60	1.00
F	0.30	0.60
G	1.12	1.42
H	3.40	3.80
	1.60	2.90
L	12.0	14.0
N	2.34	2.74
Q	3.15	3.55
Φ P	2.90	3.30

TO-220F 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.

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