

# BRGB20N65FL

Rev.A Mar.-2026

## / Descriptions

TO-220FL

Insulated-Gate Bipolar Transistor in a TO-220FL Plastic Package.

## / Features

650V/20A  $V_{CE(SAT)} = 1.45V(\text{typ.}) @ I_C = 20A$

Low gate charge

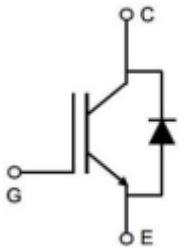
Trench FS Trench FS Technology

RoHS RoHS product

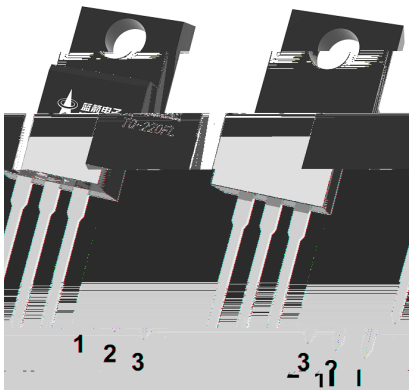
## / Applications

General purpose inverters

## / Equivalent Circuit



## / Pinning



PIN1 G

PIN 2 C

PIN 3 E

## / Marking

See Marking Instructions.

/ Absolute Maximum Ratings( $T_a=25$  )

Parameter		Symbol	Rating	Unit
Collector-Emitter Voltage		$V_{CES}$	650	V
Continuous Collector Current	$T_C=+25$	$I_C$	40	A
	$T_C=+100$		20	A
Pulsed Collector Current , Limited by $T_{Jmax}$		$I_{CM}$	80	A
Continuous Diode Forward Current	$T_C=+25$	$I_F$	40	A
	$T_C=+100$		20	A
Surge non repetitive forward current $t_p= 8.3$ ms sinusoidal		$I_{FSM}$	120	A
Gate-Emitter Voltage		$V_{GE}$	$\pm 30$	V
Power Dissipation	$T_C=+25$	$P_D$	48	W
Operating and Storage Temperature Range		$T_{STG}$	-55 to +175	
Operating Temperature Range		$T_J$	-55 to +175	
Maximum Junction-to-Ambient		$R_{\theta JA}$	78	/W
Maximum IGBT Junction-to-Case		$R_{\theta JC}$	3.10	/W
Maximum Diode Junction-to-Case		$R_{\theta JC}$	4.12	/W

/ Electrical Characteristics( $T_a=25$  )

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector-Emitter Breakdown Voltage	$BV_{CES}$	$I_C=250\mu A, V_{GE}=0V$	650			V
Zero Gate Voltage Collector current	$I_{CES}$	$V_{CE}=650V,$ $V_{GE}=0V$ $T_J=25$			35	$\mu A$
Gate-Emitter Leakage Current	$I_{GES}$	$V_{CE}=0V,$ $V_{GE}= \pm 20V$			$\pm 200$	nA
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	$V_{CE}=V_{GE} I_C=250\mu A$	4.5	5.2	6.5	V

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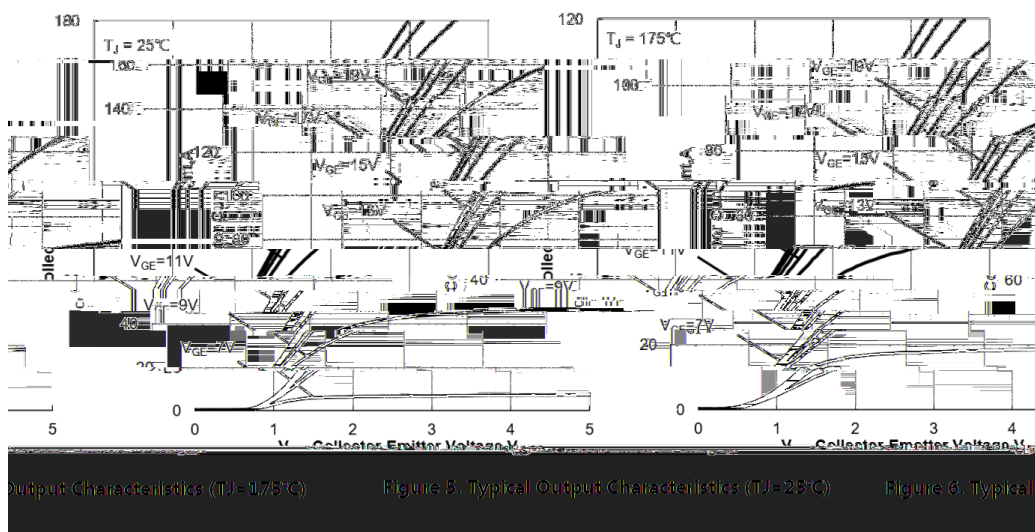
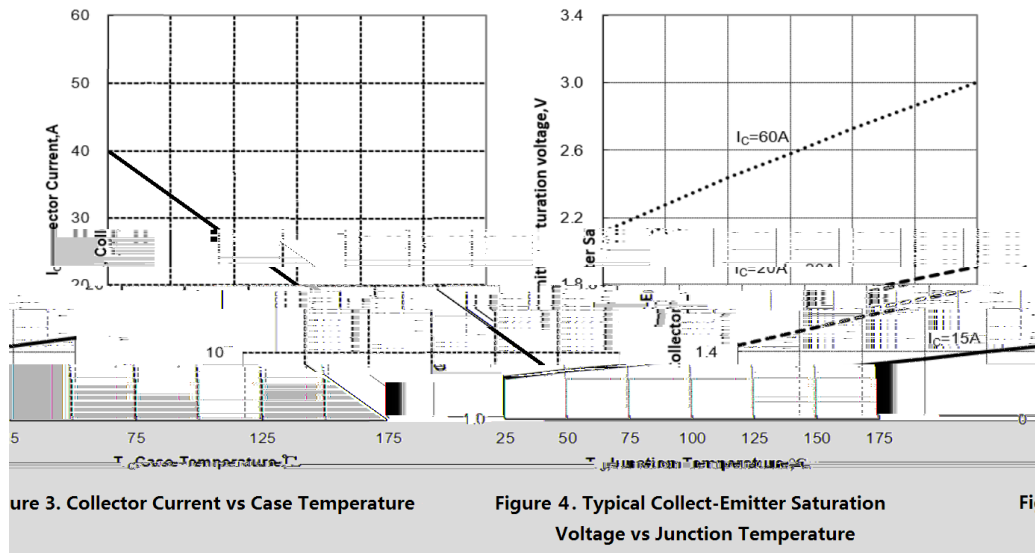
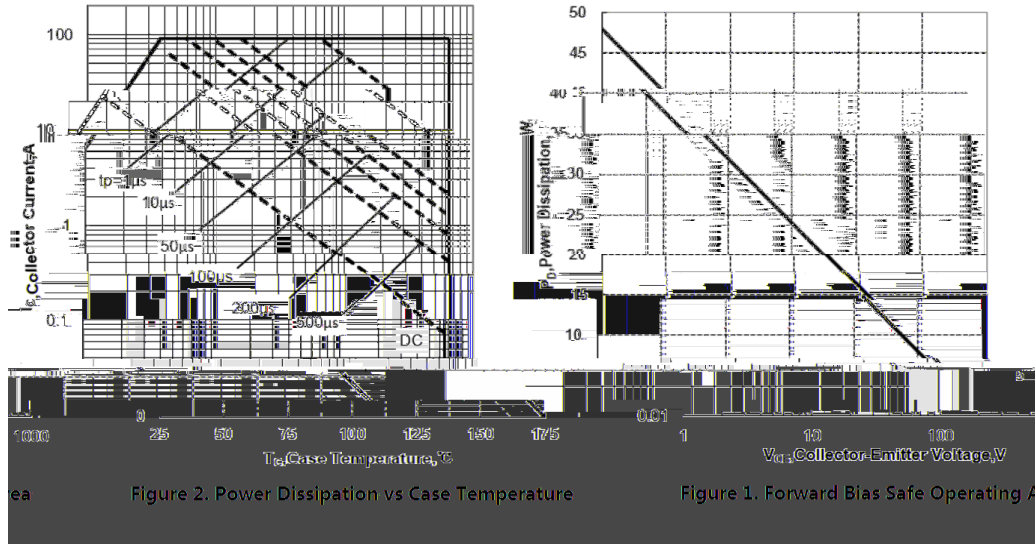
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DATA SHEET

Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$V_{GE}=15V,$ $I_C=20A$	$T_J=25$	1.45	1.82	V
			$T_J=125$	1.68		
			$T_J=175$	1.93		
Diode Forward Voltage	$V_F$	$V_{GE}=0V,$ $I_F=20A$	$T_J=25$	1.40	1.84	V
			$T_J=125$	1.24		
			$T_J=175$	1.14		
Input Capacitance	$C_{ies}$	$V_{GE}=0V, V_{CE}=25V,$ $f=1MHz, T_J=25$		1420		pF
Output Capacitance	$C_{oes}$			72		pF

**/ Electrical Characteristic Curve**



**/ Electrical Characteristic Curve**

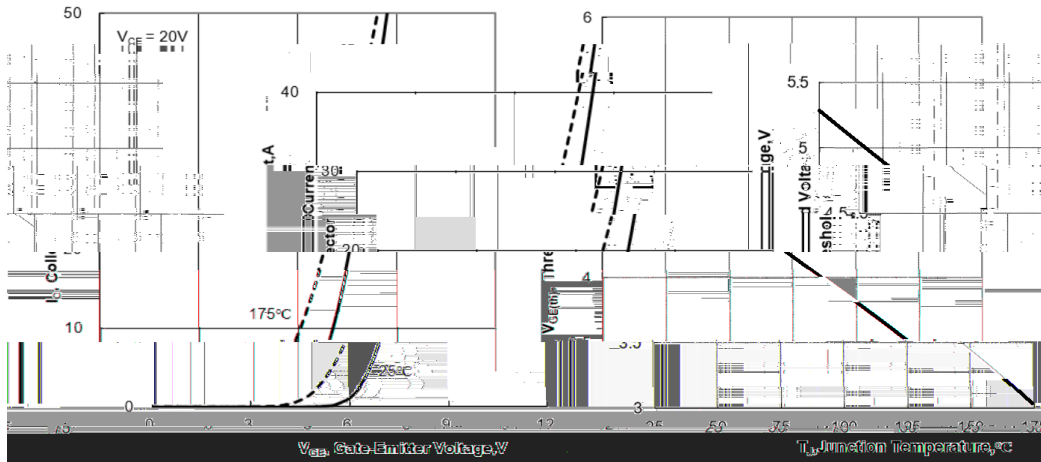


Figure 7. Typical Transfer Characteristics
Figure 8. Typical Gate-Emitter Threshold Voltage vs Junction Temperature

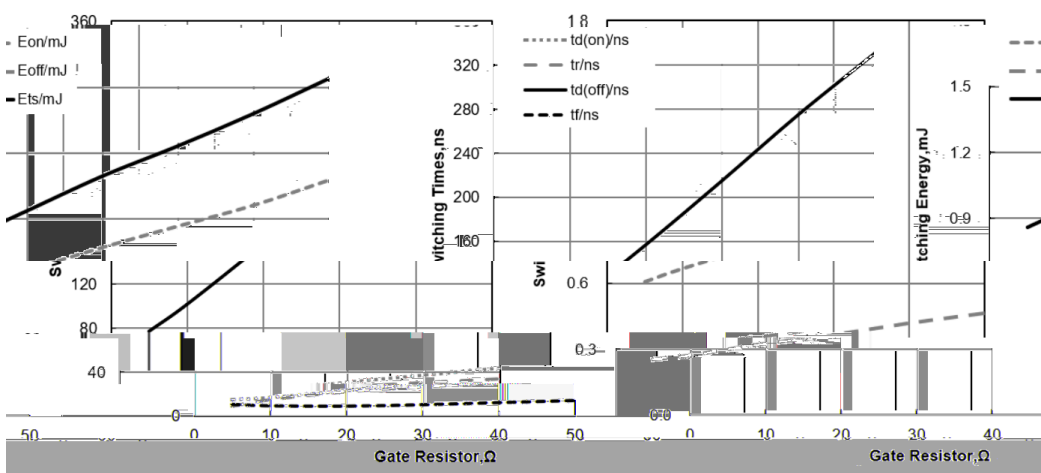
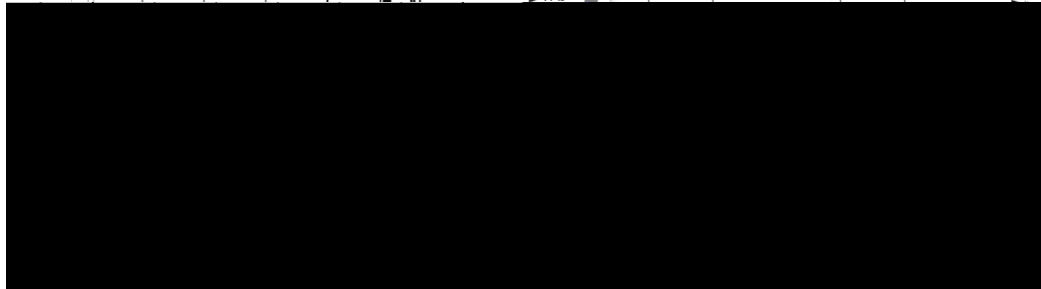
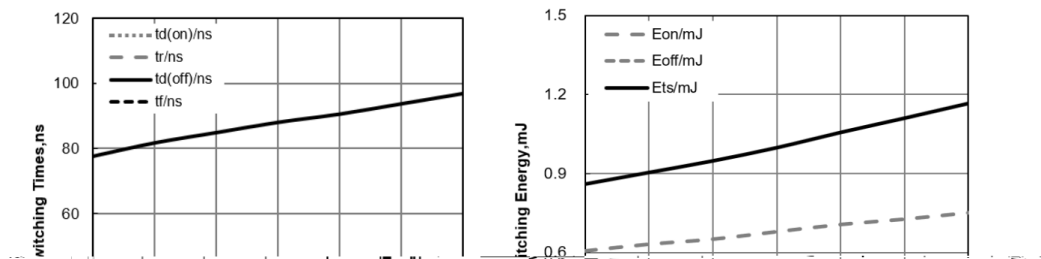
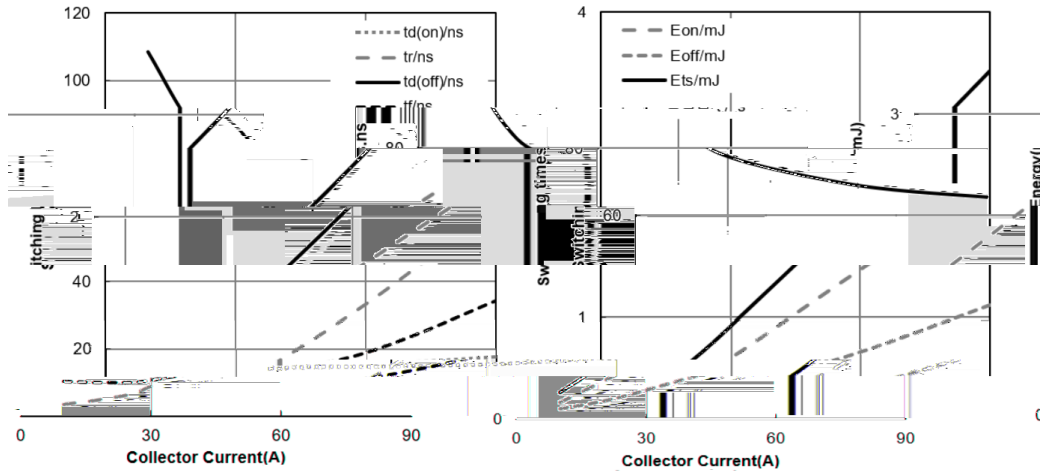


Figure 9. Typical Switching Times vs Gate Resistor (T<sub>J</sub>=25°C, V<sub>CE</sub>=400V, V<sub>GE</sub>=15/0V, I<sub>C</sub>=20A)
Figure 10. Typical Switching Energy vs Gate Resistor (T<sub>J</sub>=25°C, V<sub>CE</sub>=400V, V<sub>GE</sub>=15/0V, I<sub>C</sub>=20A)

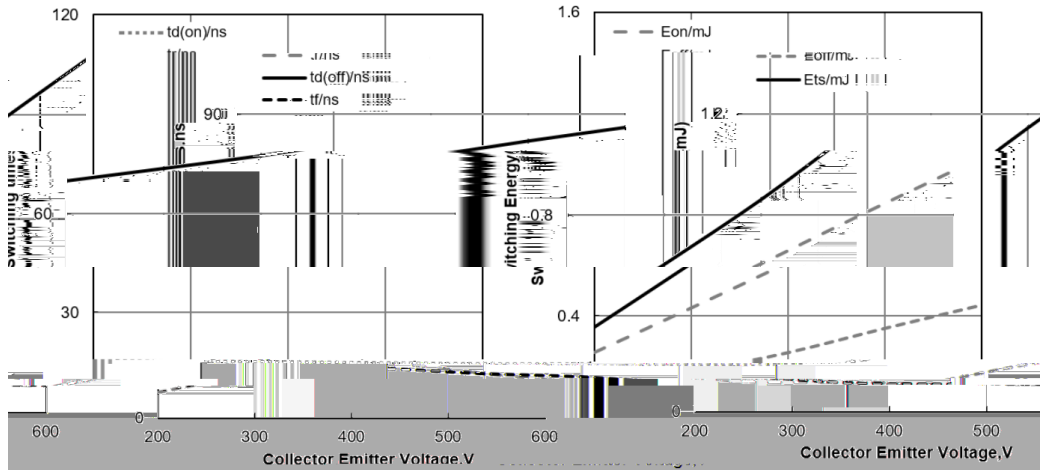


**/ Electrical Characteristic Curve**



**Figure 13. Typical Switching Times vs Collector Current (TJ=25°C, VCE=400V, VGE=15/0V)**

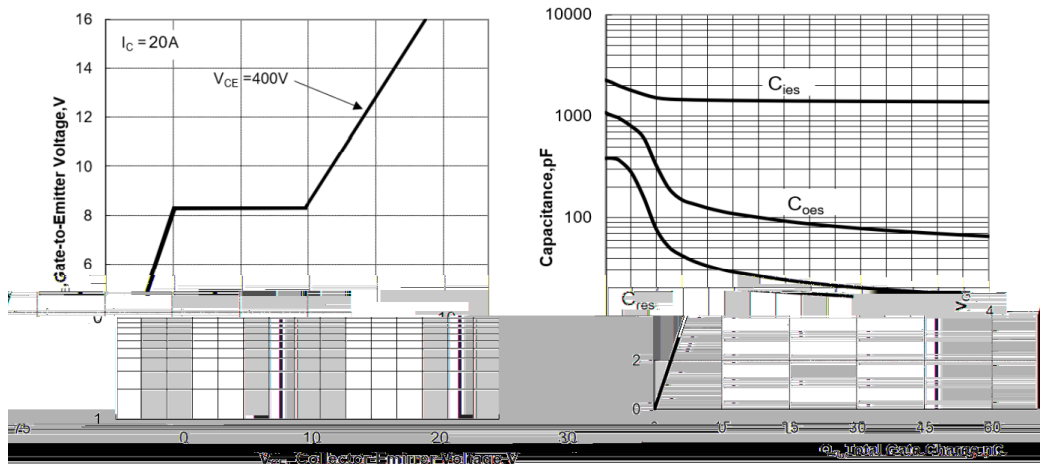
**Figure 14. Typical Switching Energy vs Collector Current (TJ=25°C, VCE=400V, VGE=15/0V)**



**Figure 15. Typical Switching Times vs VCE (TJ=25°C, VGE=15/0V, IC=30A)**

**Figure 16. Typical Switching Energy vs VCE (TJ=25°C, VGE=15/0V, IC=30A)**

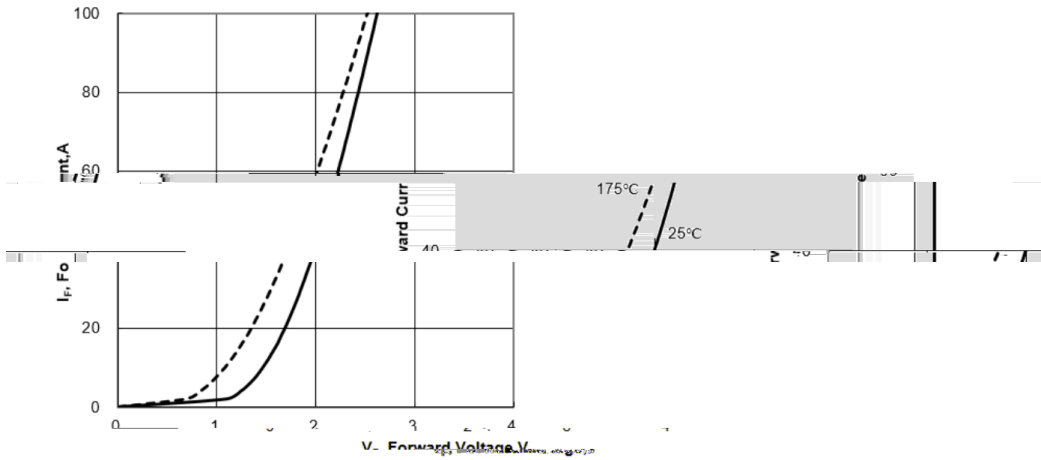
**Figure 17. Typical Gate Charge vs VCE (TJ=25°C, IC=30A)**



**Figure 18. Typical Capacitance vs Collector-Emmitter Voltage (TJ=25°C, IC=30A)**

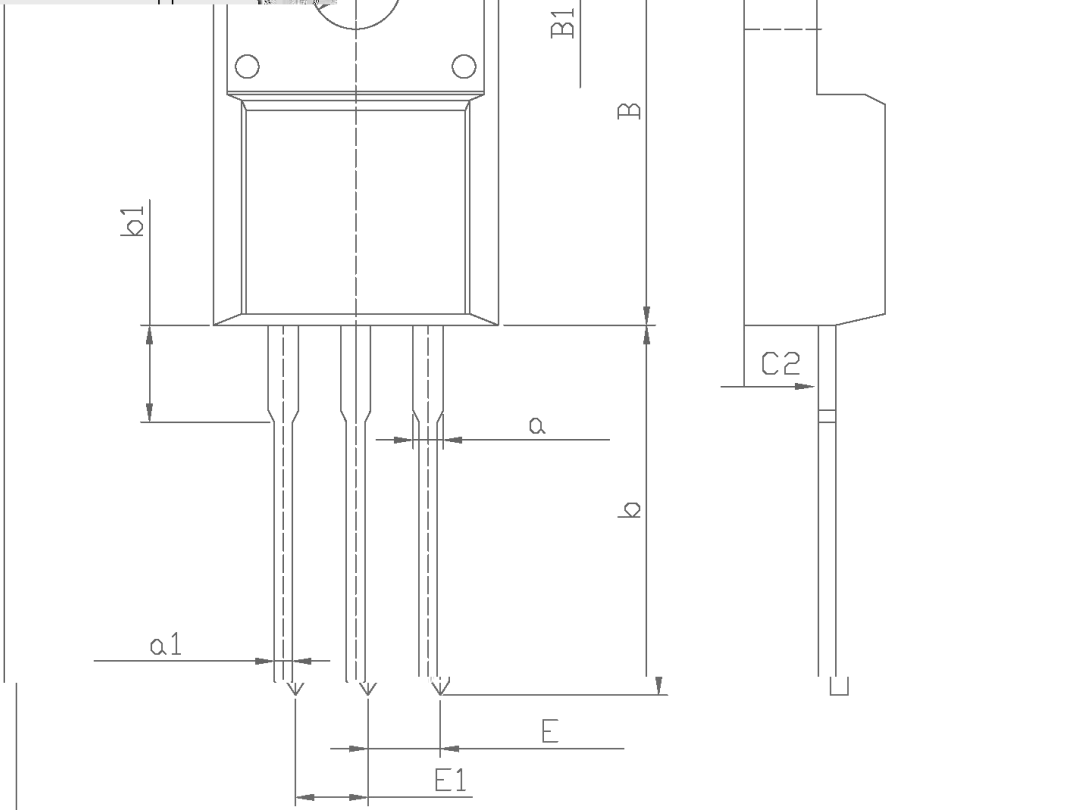
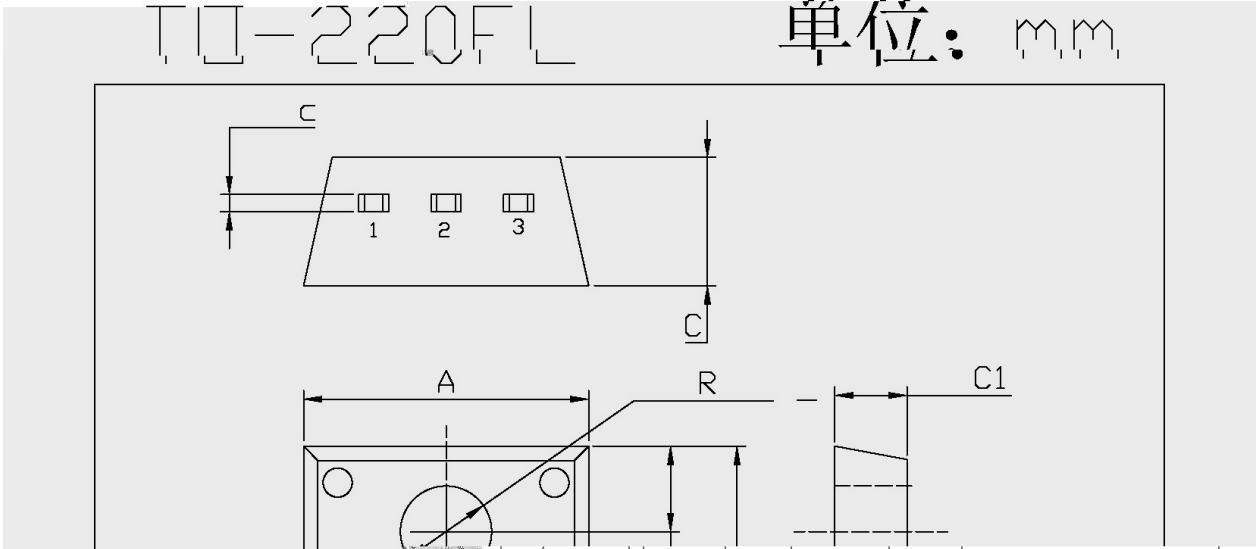
**Figure 17. Typical Gate Charge vs VCE (TJ=25°C, IC=30A)**

**/ Electrical Characteristic Curve**



**Figure 19. Typical Diode Forward Current**

**/ Package Dimensions**



Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
C	4.5	4.9	b1	2.00	2.00

**/ Marking Instructions**



