

Rev.B May.-2026

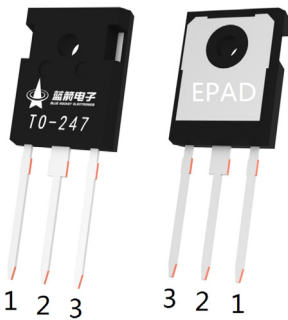
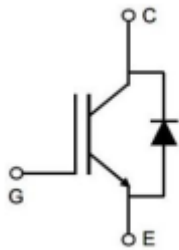
TO-247

Insulated-Gate Bipolar Transistor in a TO-247 Plastic Package.

$V_{CES} = 650V$   $I_C (T_C=100^\circ C) = 75A$

$V_{CE(SAT)} = 2.00V(\text{typ.}) @ V_{GE}=15V, I_C = 75A$

Motor driver, Uninterrupted Power Supply, , Portable power station.



PIN1 G      PIN 2 EPAD C      PIN 3 E

See Marking Instructions.

| Parameter                                        |           | Symbol          | Rating      | Unit    |
|--------------------------------------------------|-----------|-----------------|-------------|---------|
| Collector-Emitter Voltage                        |           | $V_{CES}$       | 650         | V       |
| Gate-Emitter Voltage                             |           | $V_{GES}$       | 30          | V       |
| Continuous Collector Current                     | $T_C=25$  | $I_C$           | 150         | A       |
|                                                  | $T_C=100$ |                 | 75          | A       |
| Pulsed Collector Current , Limited by $T_{Jmax}$ |           | $I_{CM}$        | 300         | A       |
| Continuous Diode Forward Current                 | $T_C=25$  | $I_F$           | 150         | A       |
|                                                  | $T_C=100$ |                 | 75          | A       |
| Diode Repetitive Peak Forward Current            |           | $I_{FRM}$       | 300         | A       |
| Short circuit withstand time                     |           | $t_{sc}$        | 8           | $\mu s$ |
| Power Dissipation                                | $T_C=25$  | $P_D$           | 341         | W       |
| Maximum Temperature for Soldering                |           | $T_L$           | 260         |         |
| Operating Junction Temperature Range             |           | $T_J$           | -40 to +175 |         |
| Storage Temperature Range                        |           | $T_{STG}$       | -55 to +175 |         |
| Maximum Junction-to-Ambient                      |           | $R_{\theta JA}$ | 40          | /W      |
| Maximum IGBT Junction-to-Case                    |           | $R_{\theta JC}$ | 0.55        | /W      |
| Maximum Diode Junction-to-Case                   |           | $R_{\theta JC}$ | 1.44        | /W      |

| Parameter                            | Symbol        | Test Conditions                    | Min       | Typ  | Max  | Unit    |
|--------------------------------------|---------------|------------------------------------|-----------|------|------|---------|
| Collector-Emitter Breakdown Voltage  | $BV_{CES}$    | $I_C=1mA, V_{GE}=0V$               | 650       |      |      | V       |
| Zero Gate Voltage Collector current  | $I_{CES}$     | $V_{CE}=650V, V_{GE}=0V$           |           |      | 10   | $\mu A$ |
| Gate-Emitter Leakage Current         | $I_{GES}$     | $V_{CE}=0V, V_{GE}= \pm 20V$       |           |      | 200  | nA      |
| Gate-Emitter Threshold Voltage       | $V_{GE(th)}$  | $I_C=1.0mA, V_{GE}=0V$             | 4.3       | 5.3  | 6.3  | V       |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | $V_{GE}=15V, I_C=75A$              | $T_J=25$  | 2.00 | 2.30 | V       |
|                                      |               |                                    | $T_J=125$ | 2.23 |      |         |
|                                      |               |                                    | $T_J=175$ | 2.37 |      |         |
| Total Gate Charge                    | $Q_g$         | $V_{GE}=15V, V_{CC}=520V, I_C=75A$ |           | 167  |      | nC      |
| Gate to Emitter Charge               | $Q_{ge}$      |                                    |           | 20   |      |         |
| Gate to Collector Charge             | $Q_{gc}$      |                                    |           | 25   |      |         |

| Parameter                           | Symbol       | Test Conditions                                                                   |           | Min | Typ  | Max  | Unit    |
|-------------------------------------|--------------|-----------------------------------------------------------------------------------|-----------|-----|------|------|---------|
| Turn-On Delay Time                  | $t_{d(on)}$  | $V_{GE}=15V$ ,<br>$V_{CC}=400V$<br>$I_C=75A$ ,<br>$R_G=5\Omega$<br>Inductive Load | $T_J=25$  |     | 39   |      | ns      |
|                                     |              |                                                                                   | $T_J=175$ |     | 42   |      | ns      |
| Turn-On Rise Time                   | $t_r$        |                                                                                   | $T_J=25$  |     | 71   |      | ns      |
|                                     |              |                                                                                   | $T_J=175$ |     | 75   |      | ns      |
| Turn-Off Delay Time                 | $t_{d(off)}$ |                                                                                   | $T_J=25$  |     | 131  |      | ns      |
|                                     |              |                                                                                   | $T_J=175$ |     | 162  |      | ns      |
| Turn-Off Fall Time                  | $t_f$        |                                                                                   | $T_J=25$  |     | 44   |      | ns      |
|                                     |              |                                                                                   | $T_J=175$ |     | 40   |      | ns      |
| Turn-On Energy                      | $E_{on}$     |                                                                                   | $T_J=25$  |     | 2.63 |      | mJ      |
|                                     |              |                                                                                   | $T_J=175$ |     | 2.83 |      | mJ      |
| Turn-Off Energy                     | $E_{off}$    |                                                                                   | $T_J=25$  |     | 0.18 |      | mJ      |
|                                     |              |                                                                                   | $T_J=175$ |     | 0.20 |      | mJ      |
| Total Switching Energy              | $E_{ts}$     |                                                                                   | $T_J=25$  |     | 2.81 |      | mJ      |
|                                     |              |                                                                                   | $T_J=175$ |     | 3.03 |      | mJ      |
| Input Capacitance                   | $C_{ies}$    | $V_{GE}=0V$ , $V_{CE}=25V$<br>$f=1MHz$                                            |           |     | 3360 |      | pF      |
| Output Capacitance                  | $C_{oes}$    |                                                                                   |           |     | 179  |      | pF      |
| Reverse Transfer Capacitance        | $C_{res}$    |                                                                                   |           |     | 90   |      | pF      |
| Diode Forward Voltage               | $V_F$        | $I_F=40A$                                                                         | $T_J=25$  |     | 1.55 | 1.95 | V       |
|                                     |              |                                                                                   | $T_J=125$ |     | 1.32 |      |         |
|                                     |              |                                                                                   | $T_J=175$ |     | 1.26 |      |         |
| Diode Reverse Recovery Time         | $T_{rr}$     | $VR=400V$ ,<br>$I_F=40A$<br>$dI_F/dt=200$<br>A/us                                 | $T_J=25$  |     | 90   |      | ns      |
|                                     |              |                                                                                   | $T_J=175$ |     | 117  |      |         |
| Diode Reverse Recovery Charge       | $Q_{rr}$     |                                                                                   | $T_J=25$  |     | 112  |      | $\mu C$ |
|                                     |              |                                                                                   | $T_J=175$ |     | 163  |      |         |
| Diode Peak Reverse Recovery Current | $I_{rm}$     |                                                                                   | $T_J=25$  |     | 3.2  |      | A       |
|                                     |              |                                                                                   | $T_J=175$ |     | 4.6  |      |         |

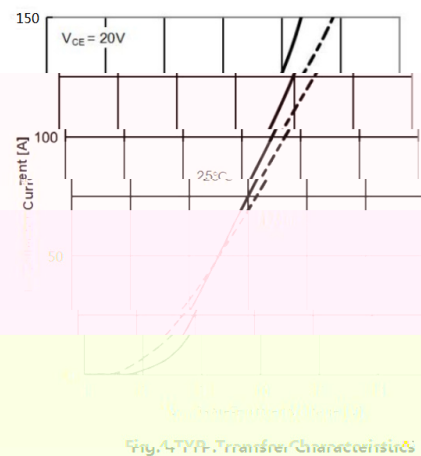
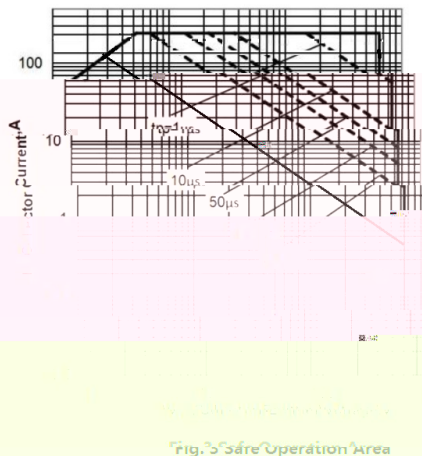
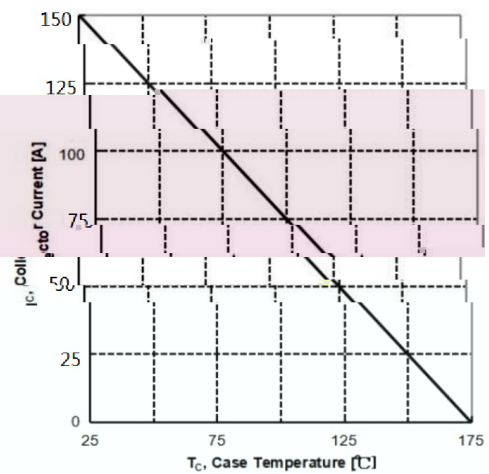
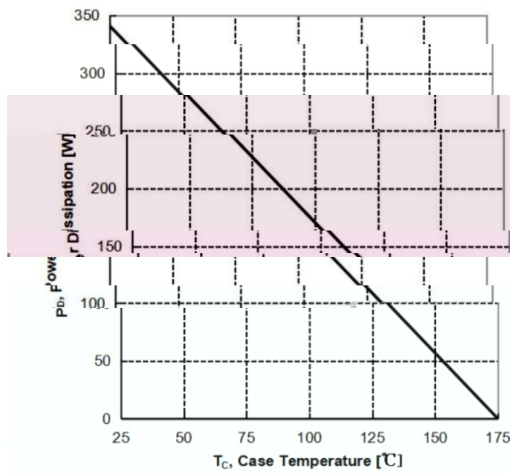
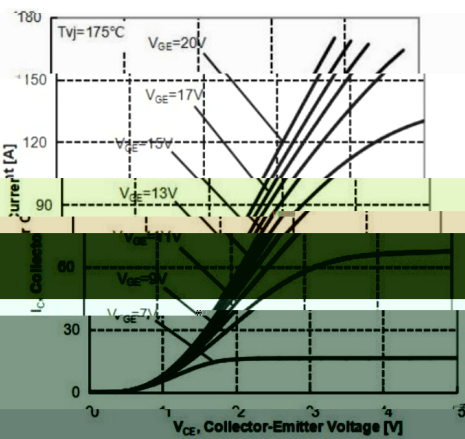
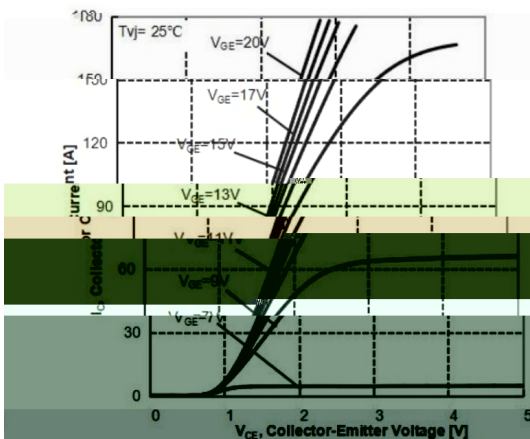
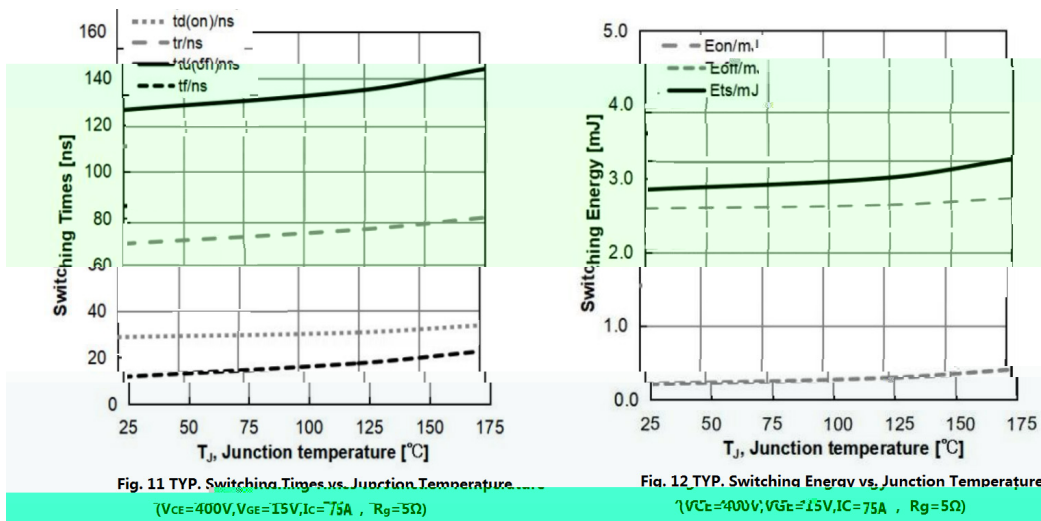
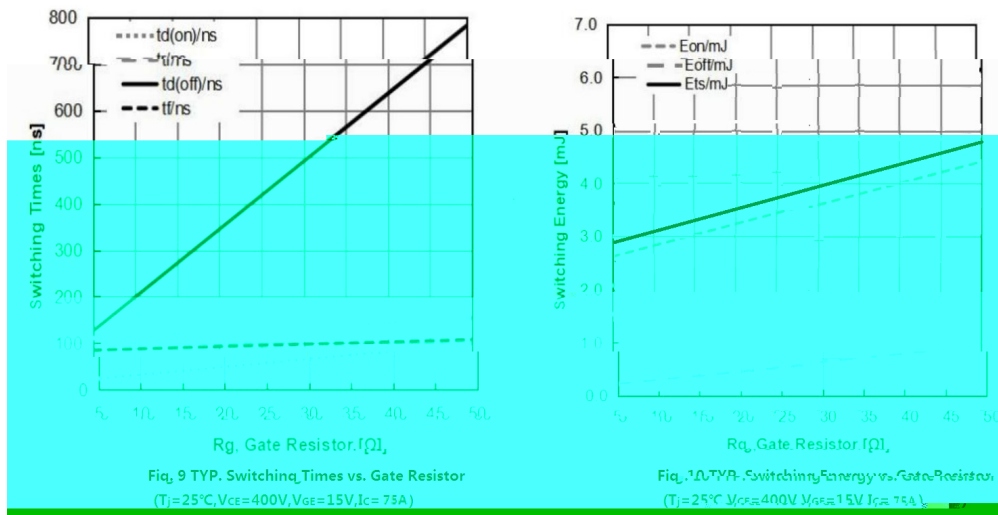
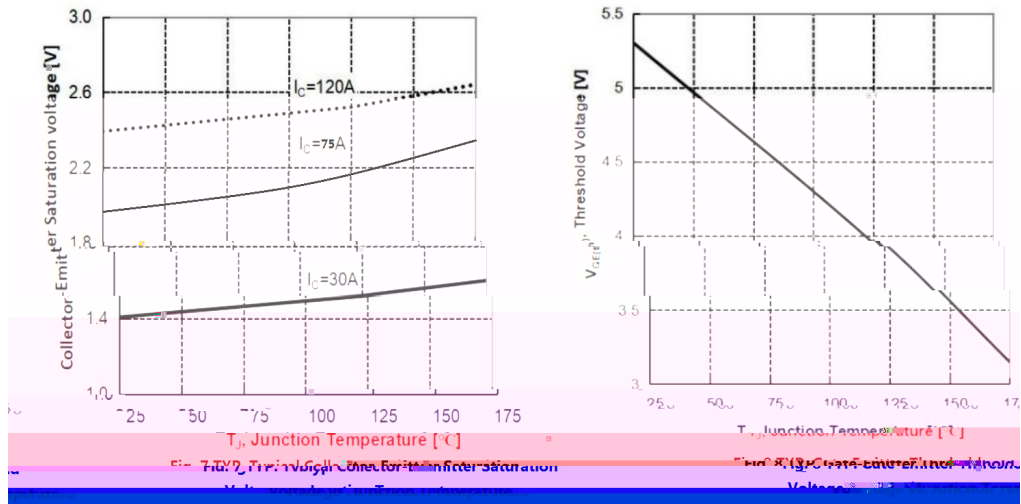
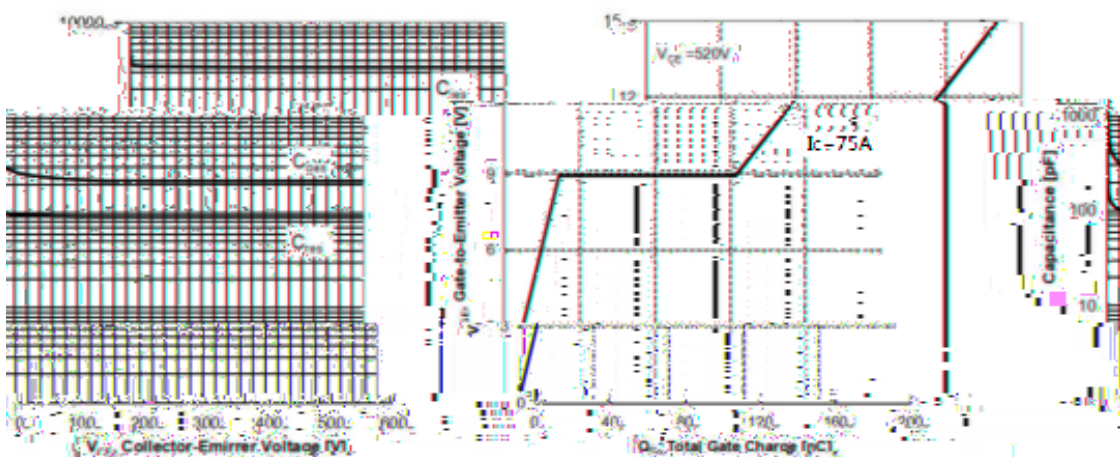
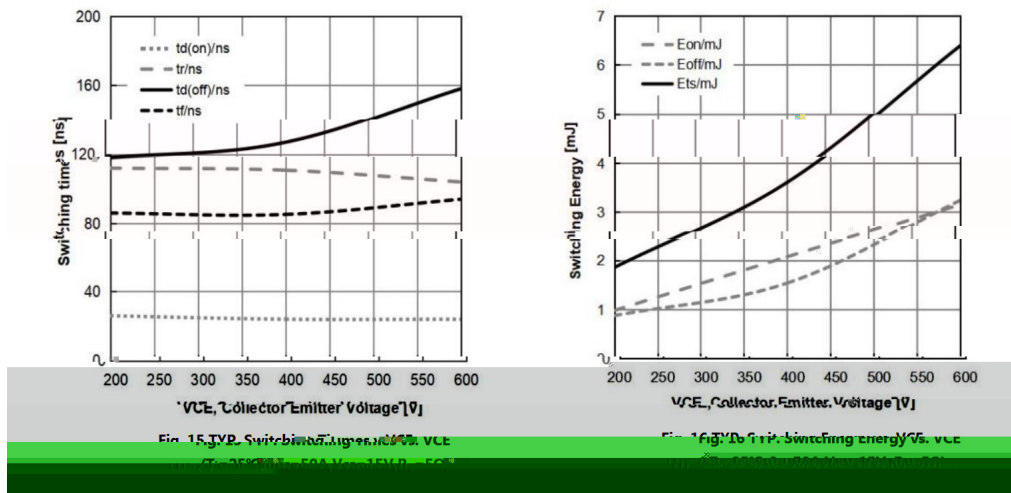
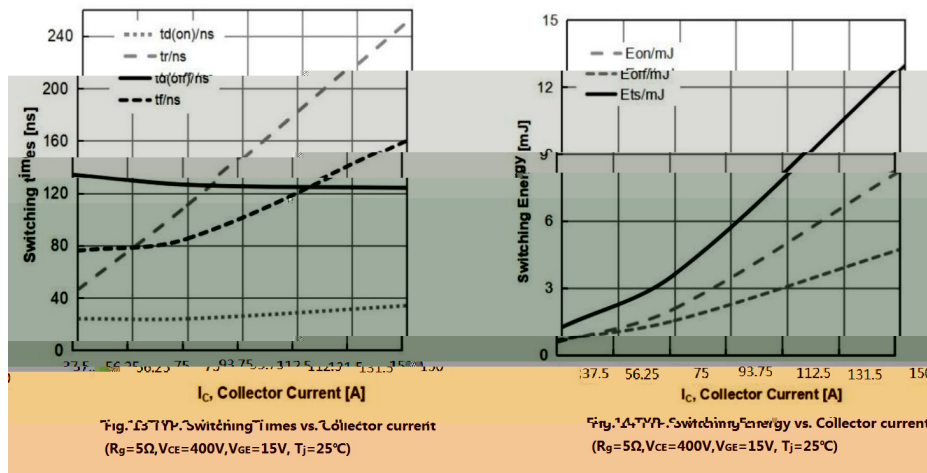


Fig. 3 Forward bias safe operating area (FSOA) Fig. 4 Forward bias transfer characteristics

$T_J = 25^\circ\text{C}$ ,  $T \leq 175^\circ\text{C}$ ,  $V_{DS} = 15\text{V}$ , Recommended maximum power dissipation at  $25^\circ\text{C}$ , use at  $V_{GS} \geq 7.5\text{V}$







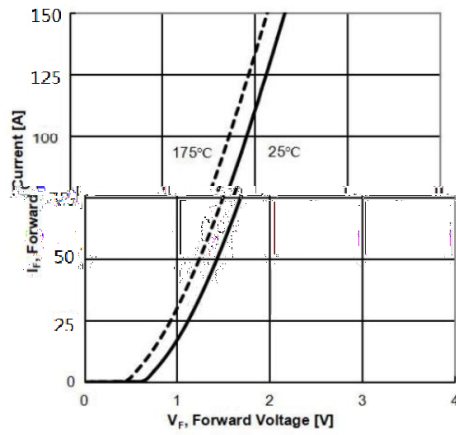
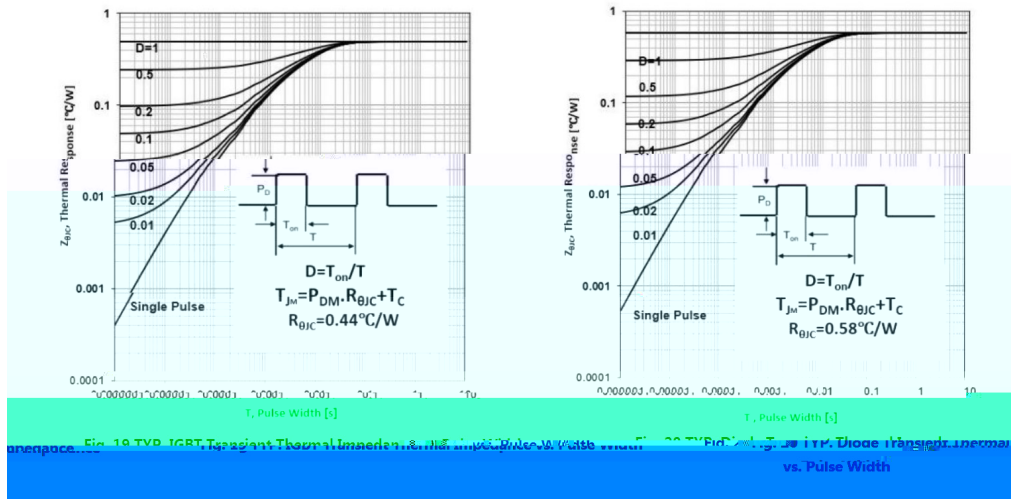
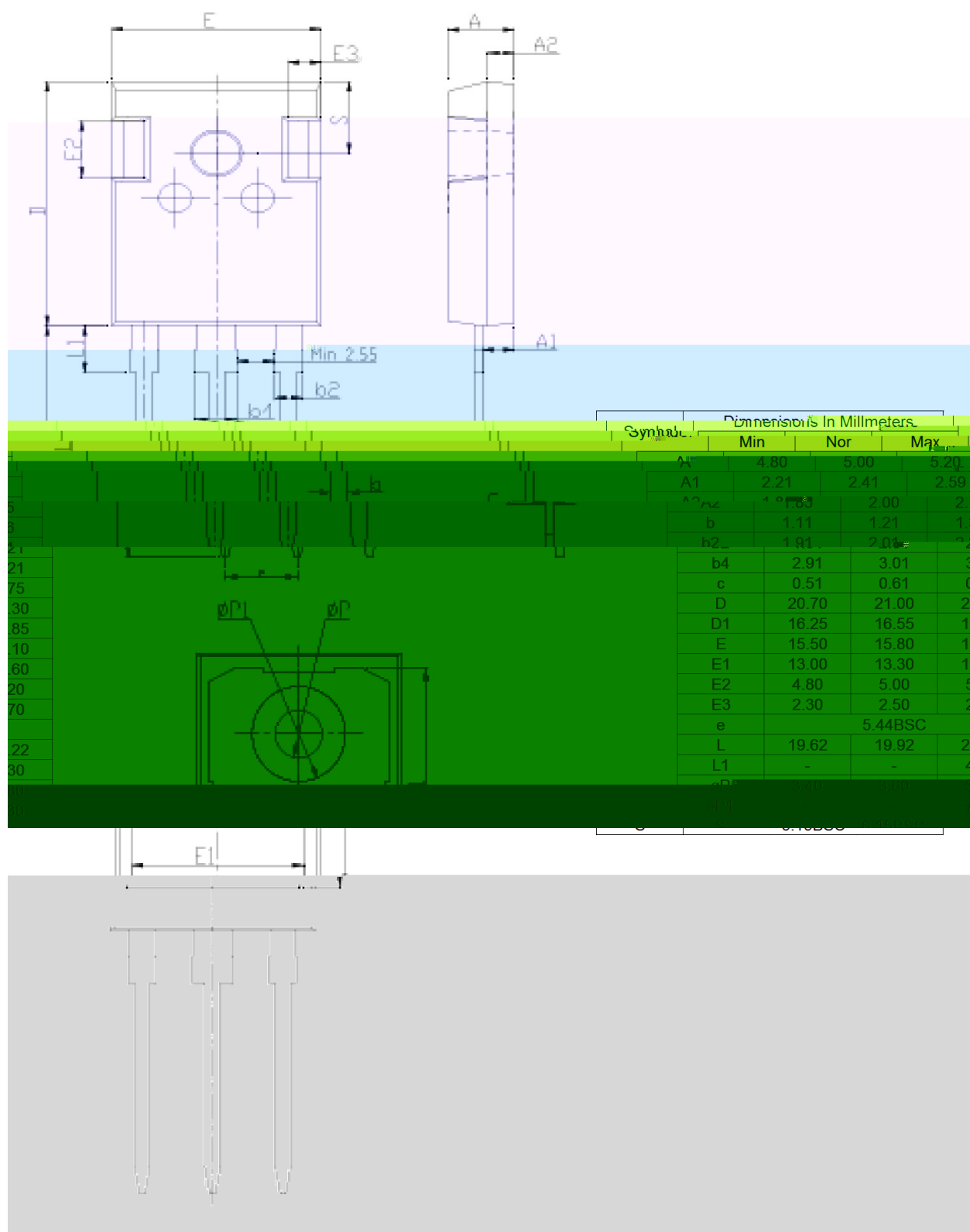
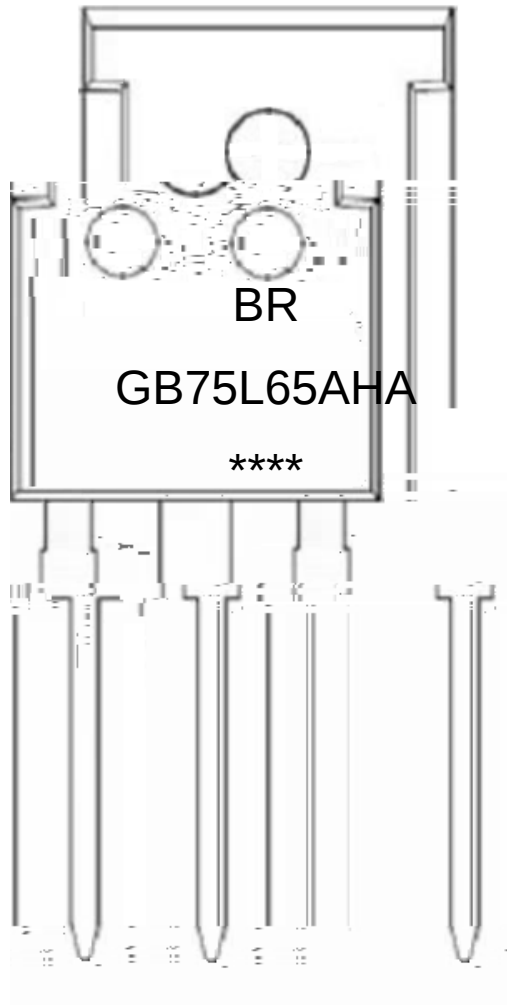


Fig. 21 TYP. Forward characteristic of Diode





BR

GB75L65AHA

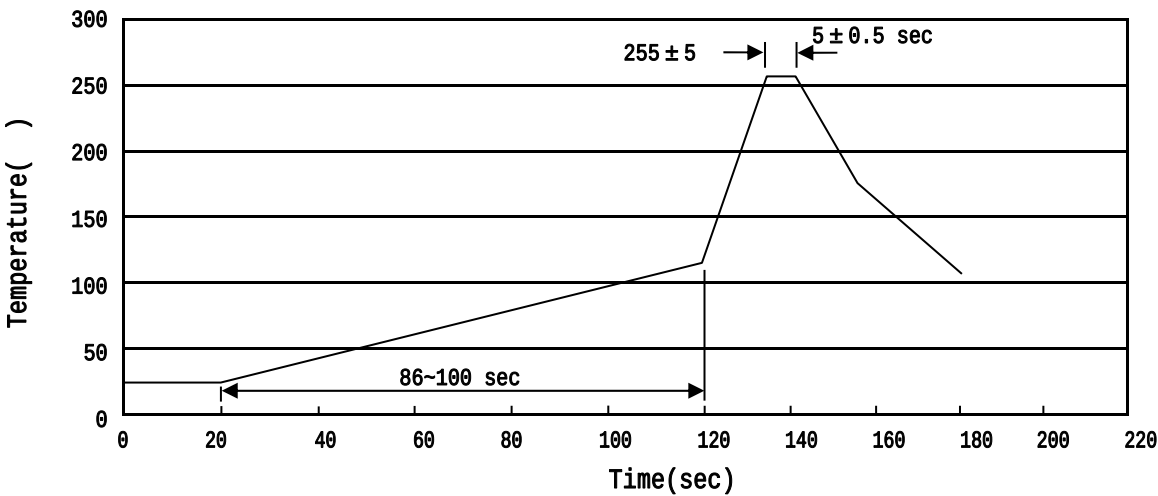
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Note:

BR: Company Code

GB75L65AHA: Product Type Code

\*\*\*\*: Lot No. Code, code change with Lot No.



Note:

- 1

25 150

60 90sec;
- 2

255±5

5±0.5sec;
- 3

2 10

/sec.
- 1.Preheating:25~150

, Time:60~90sec.
- 2.Peak Temp.:255±5

, Duration:5±0.5sec.
3. Cooling Speed: 2~10

/sec.

270±5

10±1 sec.

Temp.:270±5

Time:10±1 sec

/ TUBE

| Package Type | Units |  |  |  |  | Dimension |  | (unit mm³) |
|--------------|-------|--|--|--|--|-----------|--|------------|
|              |       |  |  |  |  |           |  |            |
|              |       |  |  |  |  |           |  |            |

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