

Rev.A May.-2019

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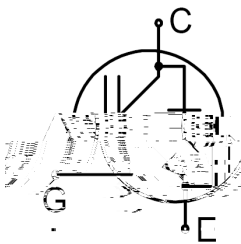
Low gate charge,, Low saturation voltage ,Positive temperature coefficient, RoHS product.

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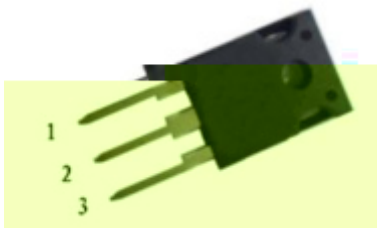
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General purpose inverter, Frequency converters, Induction Heating(IH), Uninterrupted Power Supply(UPS).

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PIN1 y Gate PIN 2 y Collector PIN 3 y Emitter

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- ~ " ¢ o See Marking Instructions.

Rev.A May.-2019

| @<br>Parameter                                         | Z<br>Symbol    | Rating   | % y<br>Unit |
|--------------------------------------------------------|----------------|----------|-------------|
| Collector-emitter voltage                              | $V_{CES}$      | 1200     | V           |
| Gate-emitter voltage                                   | $V_{GES}$      | $\pm 20$ | V           |
| Short circuit withstand time                           | $T_{SC}$       | 10       | - s         |
| Collector current                                      | $I_C$          | 30       | A           |
| Collector current@ $T_C=100$                           |                | 15       | A           |
| Collector peak current,<br>$T_P$ limited by $T_{JMAX}$ | $I_{CM}$       | 45       | A           |
| Diode forward current@ $T_C=100$                       | $I_F$          | 15       | A           |
| Diode maximum forward current                          | $I_{FM}$       | 45       | A           |
| Power dissipation( $T_C=25$ )                          | $P_D$          | 150      | W           |
| Operating junction and storage temperature<br>range    | $T_J, T_{stg}$ | -55 150  |             |
| Maximum temperature for soldering                      | $T_L$          | 300      |             |
| IGBT thermal resistance,junction-case                  | $R_{th(jc)}$   | 0.63     | /W          |

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| @<br>Parameter                            | Z<br>Symbol            | y i Ū<br>Test Conditions                                         | ´ 4<br>Min | ` ¨<br>Typ | ´ Ý<br>Max | % y<br>Unit |
|-------------------------------------------|------------------------|------------------------------------------------------------------|------------|------------|------------|-------------|
| Collector-emitter breakdown voltage       | $V_{CES}$              | $V_{GE}=0V; I_{CE}=500\mu A$                                     | 1200       | -          | -          | V           |
| Breakdown Voltage Temperature Coefficient | $\frac{BV_{CES}}{T_J}$ | $I_{CE}=1mA$ ;reference to 25                                    |            | 0.6        |            | V/          |
| Zero gate voltage Collector current       | $I_{CES}$              | $V_{GE}=0V; V_{CE}=1200V$<br>$T_C=25$                            | -          | -          | 0.2        | mA          |
|                                           |                        | $T_C=100$                                                        |            |            | 2          | mA          |
|                                           |                        | $T_C=150$                                                        |            |            | 2.5        | mA          |
| Gate-body leakage current                 | $I_{GES}$              | $V_{GE}=\pm 20V; V_{CE}=0V$                                      | -          | -          | $\pm 100$  | nA          |
| Gate threshold voltage                    | $V_{GE(th)}$           | $I_C=600 - A; V_{CE}=V_{GE}$                                     | 4.5        |            | 6.5        | V           |
| Collector-emitter saturation voltage      | $V_{CE(sat)}$          | $I_C=15A; V_{GE}=15V$<br>$T_C=25$                                | -          | 2          | 2.5        | V           |
|                                           |                        | $T_C=100$                                                        |            | 2.2        |            | V           |
|                                           |                        | $T_C=150$                                                        |            | 2.3        |            | V           |
| Forward Transconductance                  | $g_{fs}$               | $V_{CE}=20V; I_C=15A$                                            |            | 10         |            | S           |
| Short Collector current                   | $I_{C(SC)}$            | $V_{GE}=15V; V_{CE}=600V;$<br>$t_{sc} \varnothing 10 - s T_C=25$ |            | 90         |            | A           |
| Input capacitance                         | $C_{ies}$              | $V_{CE}=25V, V_{GE}=0V, f=1MHz$                                  | -          | 1330       | 2000       | pF          |
| Output capacitance                        | $C_{oes}$              |                                                                  | -          | 128        | 200        |             |
| Reverse transfer capacitance              | $C_{res}$              |                                                                  | -          | 88         | 140        |             |

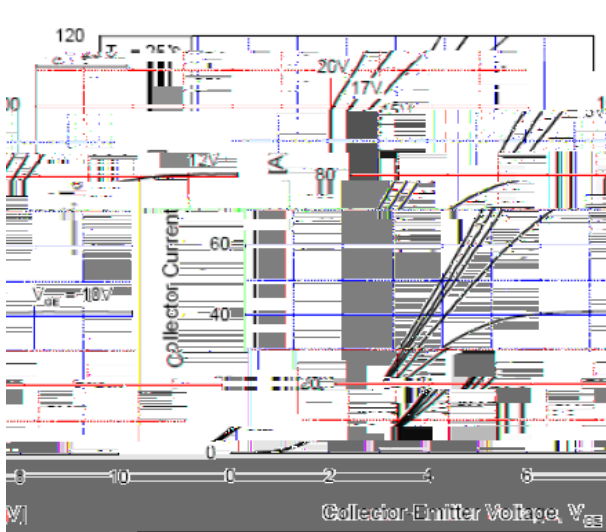
Rev.A May.-2019

| @<br>Parameter          | Z<br>Symbol  | y i Ū<br>Test Conditions                             | ´ 4<br>Min | ` ´<br>Typ | ´ Ý<br>Max | % y<br>Unit |
|-------------------------|--------------|------------------------------------------------------|------------|------------|------------|-------------|
| Turn-on delay time      | $t_{d(ON)}$  | $V_{CE}=600V \quad I_C=15A$<br>$R_G=56 \quad T_c=25$ | -          | 70         | -          | ns          |
| Rise time               | $t_r$        |                                                      | -          | 150        | -          |             |
| Turn-off delay time     | $t_{d(OFF)}$ |                                                      | -          | 300        | -          |             |
| Fall time               | $t_f$        |                                                      | -          | 80         | -          |             |
| Turn-On Switching Loss  | $E_{on}$     | $V_{CE}=600V \quad I_C=15A$<br>$V_{GE}=15V$          | -          | 2.3        | -          | mJ          |
| Turn-Off Switching Loss | $E_{off}$    |                                                      | -          | 1.3        | -          |             |
| Total Switching Loss    | $E_{ts}$     |                                                      | -          | 3.6        | -          |             |
| Total gate charge       | $Q_G$        | $V_{CE}=600V \quad I_C=15A$<br>$V_{GE}=15V$          | -          | 130        | 180        | nC          |
| Gate-emitter charge     | $Q_{G-E}$    |                                                      | -          | 15         | 22         |             |
| Gate-collector charge   | $Q_{G-C}$    |                                                      | -          | 50         | 65         |             |

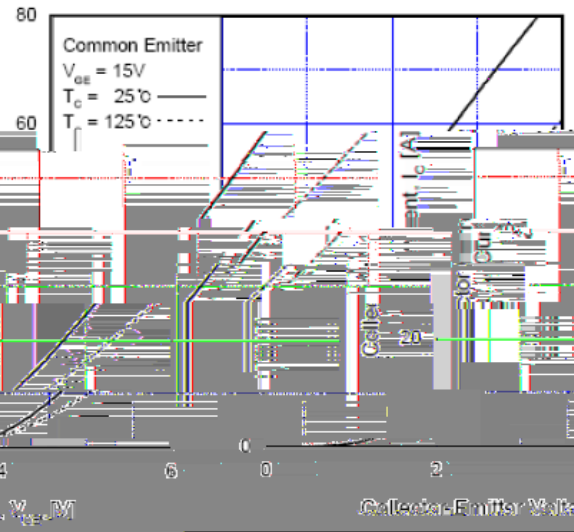
 Diode forward voltage  $V_{rr}$  55.62 513  $\frac{1}{f}$  / .1314 /

Rev.A May.-2019

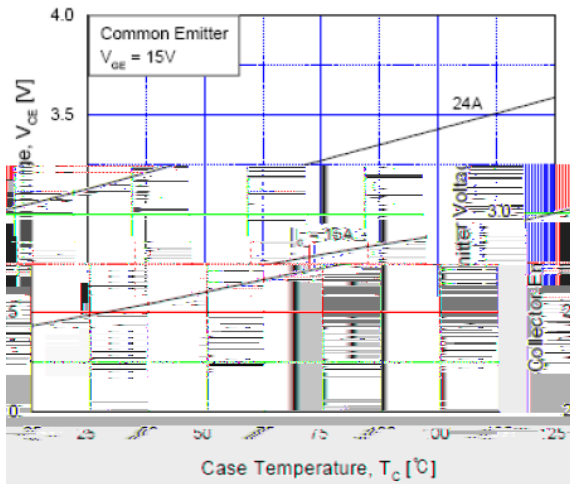
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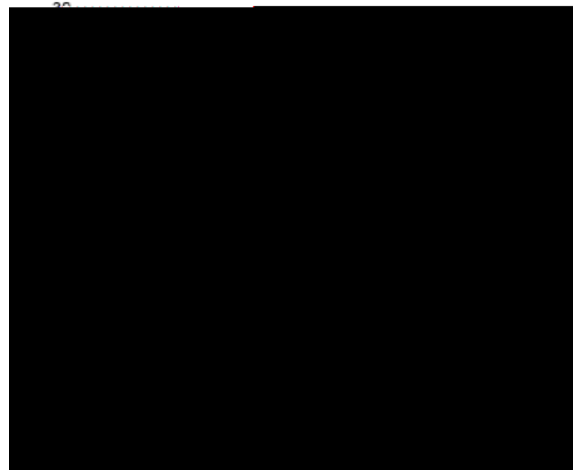
1. Typical Output Characteristics



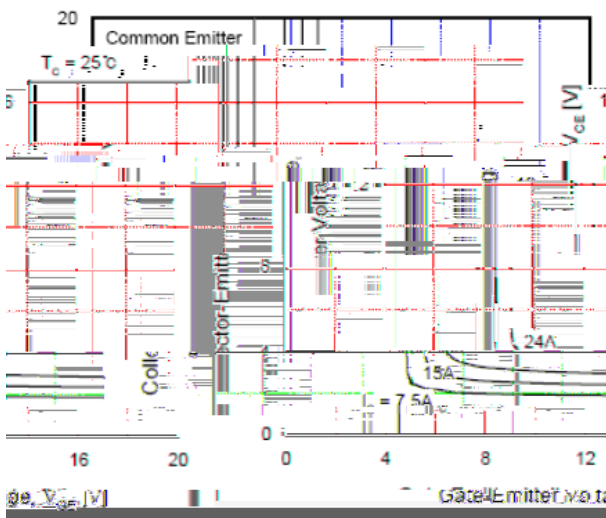
2. Typical Saturation Voltage Characteristics



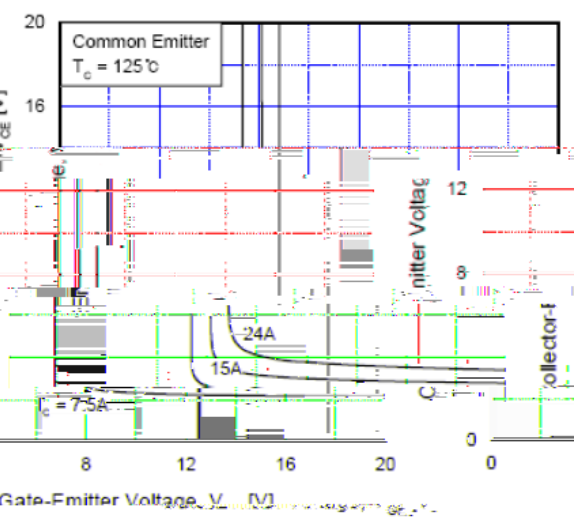
3. Saturation Voltage vs. Case Temperature at Variant Current Level



4. Load Current vs. Frequency



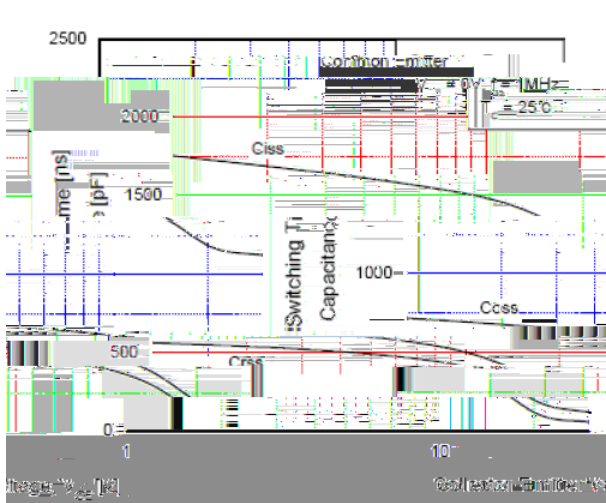
5. Saturation Voltage vs. VGE



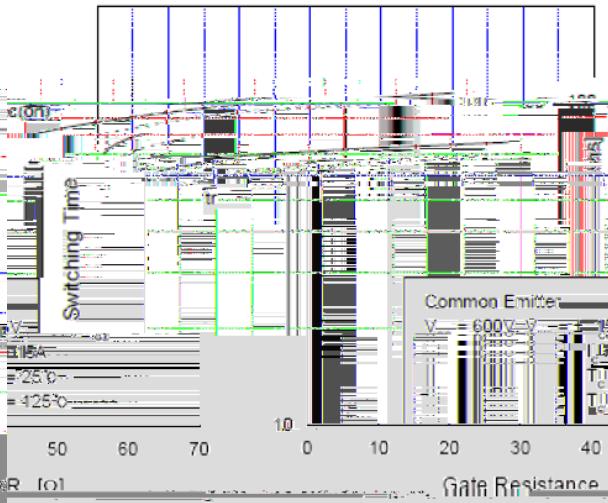
6. Saturation Voltage vs. VGE

Rev.A May.-2019

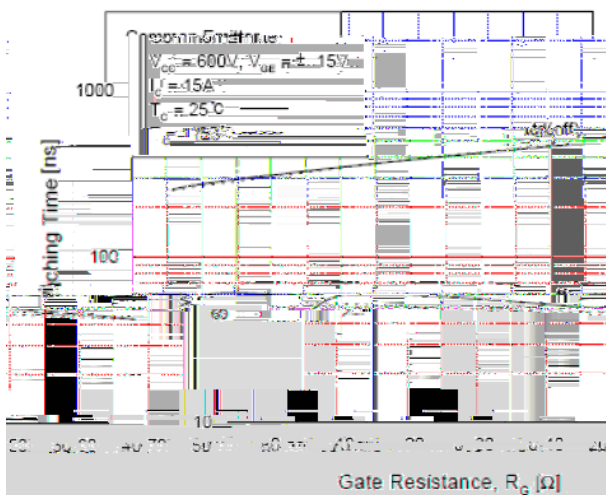
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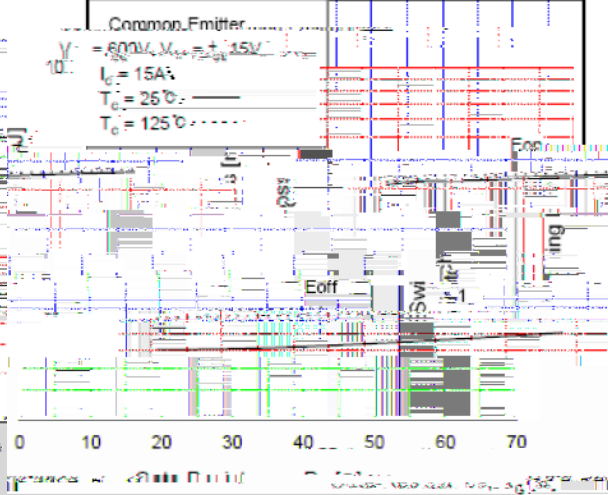
7.Capacitance Characteristics



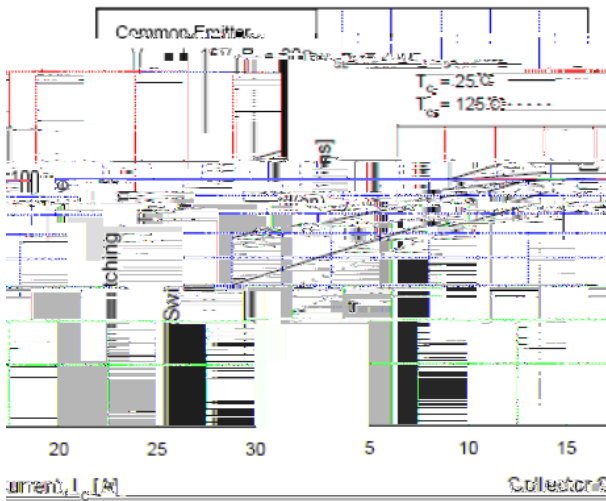
8.Turn-On Characteristics vs. Gate Resistance



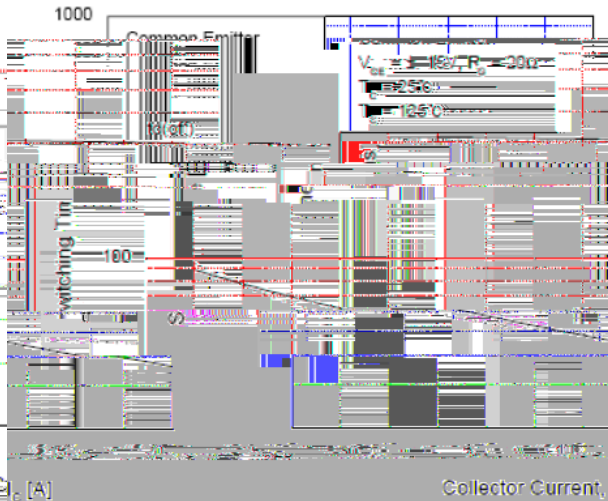
9.Turn-Off Characteristics vs. Gate Resistance



10.Switching Loss vs. Gate Resistance



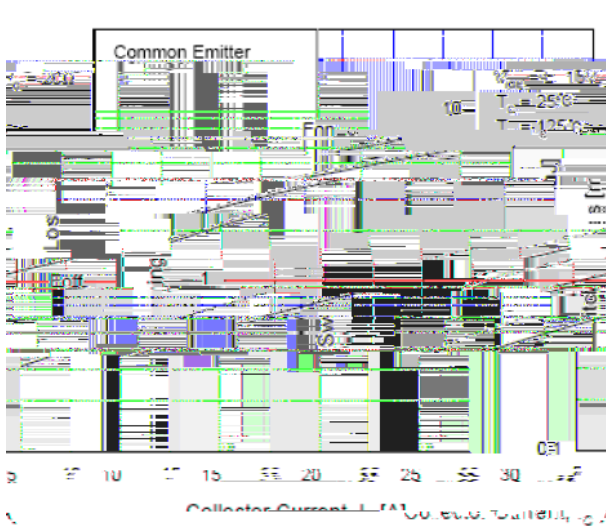
11.Turn-On Characteristics vs. Collector Current



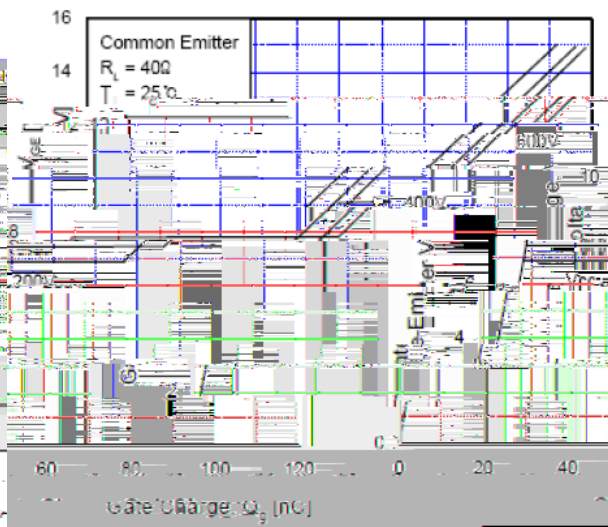
12.Turn-Off Characteristics vs. Collector Current

Rev.A May.-2019

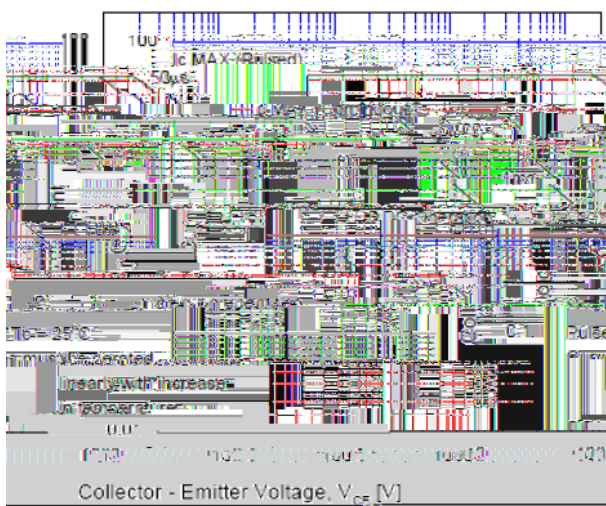
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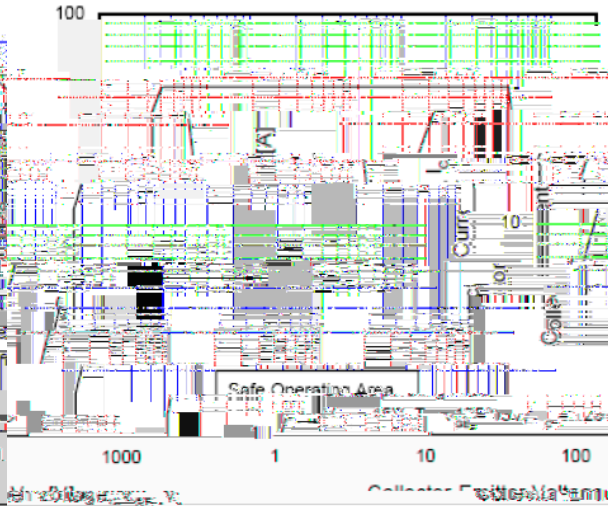
13.Switching Loss vs. Collector Current



14.Gate Charge Characteristics



15.SOA Characteristics



16.Turn-Off SOA



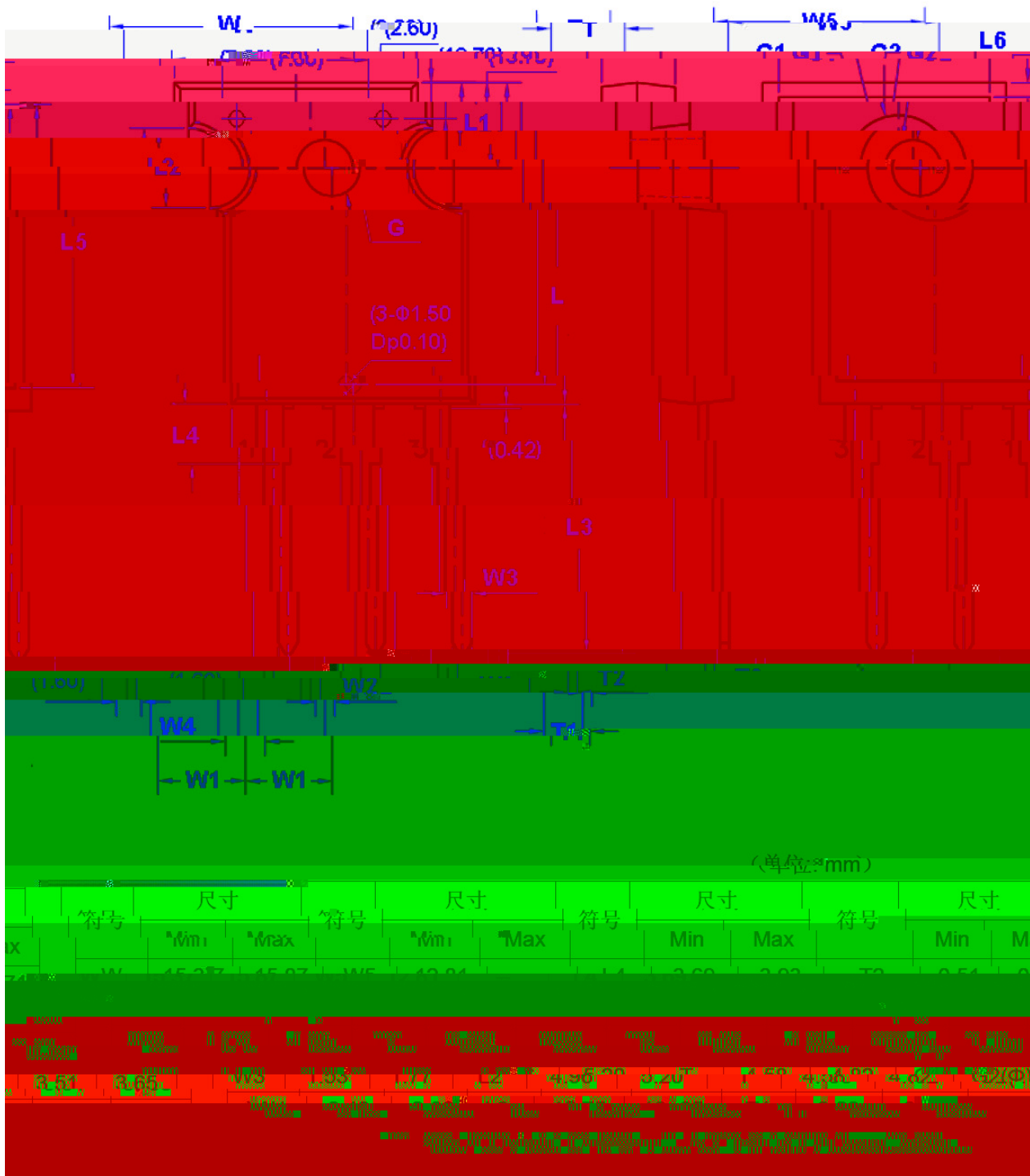
17.Transient Thermal Impedance

Rev.A May.-2019

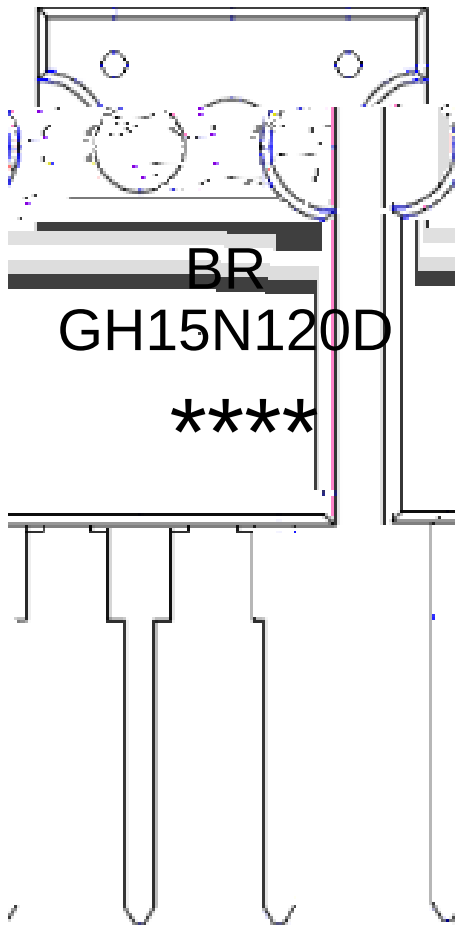
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Rev.A May.-2019

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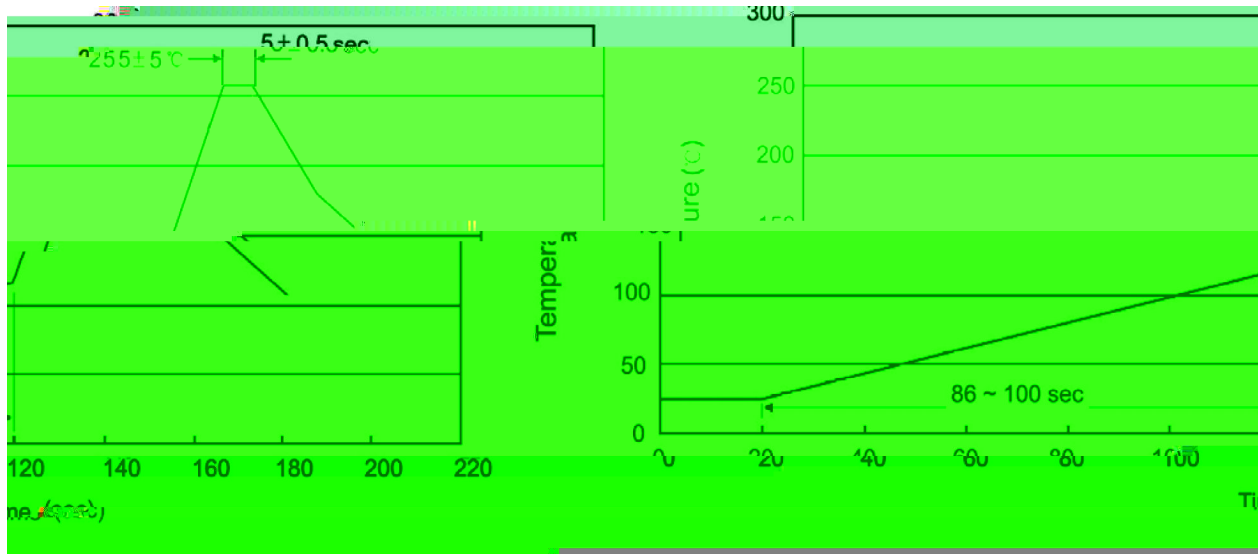


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Note:  
BR: Company Code.  
G15N120D: Product Type.  
\*\*\*\*: Lot No. Code, code change with Lot No.

Rev.A May.-2019

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1o ~ % 25 %150 - k 60 %90sec;  
 2o Q 255 r5 - k 4 Ò 5 r0.5sec;  
 3o D N òi Ò , 2 %10 - /sec.

Note:

1.Preheating:25~150 - , Time:60~90sec.  
 2.Peak Temp.:255 r5 - , Duration:5 r0.5sec.  
 3. Cooling Speed: 2~10 - /sec.

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y 270 r5 -

y 10 r1 sec.

Temp.:270±5

Time:10±1 sec

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| Package Type<br>ßm ø · | Units g m ôh    |                       |                       |                                |                        | Dimension g m d ° (unit ! mm <sup>3</sup> ) |            |             |
|------------------------|-----------------|-----------------------|-----------------------|--------------------------------|------------------------|---------------------------------------------|------------|-------------|
|                        | Units/Tube<br>/ | Tubes/Inner Box<br>/ç | Units/Inner Box<br>/ç | Inner Boxes/Outer Box<br>ç / - | Units/Outer Box<br>/ - | Tube                                        | Inner Boxç | Outer Box-  |
| TO-247                 | 30              | 15                    | 450                   | 5                              | 2250                   | 497.5×46×8                                  | 555×164×50 | 575×290×180 |

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