

DT16T Standard TRIACs

DT16T Standard TRIACs SILICON BIDIRECTIONAL THYRISTORS

General description

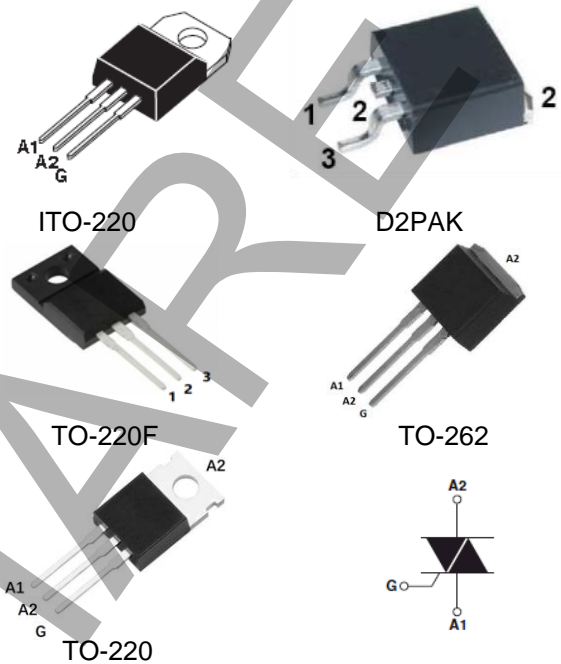
These products 16A TRIAC are packages for third quadrant, DT16T are high commutation performance without snubber circuit. It can be controlled by phase angle trigger or on/off trigger.

FEATURES

- Passivated die for reliability and uniformity
- Three-quadrant triggering TRIAC, Over 800V V_{DRM}/V_{RRM}
- 125°C operation temperature.
- Without snubber circuit.
- “Green” molding compound, UL flammability classification 94V-0, (No Br. Sb. Cl)
- Lead free in RoHS II 2015/863/EU compliant
- Moisture sensitivity meets industry standard IPC/JEDEC J-STD-020

APPLICATIONS

- General purpose AC switch control
- Control loads in Motor, Fan, and Pump.
- Solenoid drivers
- LED Dimming
- Inrush current limiting circuits



| PIN ASSIGNMENT | |
|----------------|------------------------|
| 1 | Main Terminal 1 (A1) |
| 2 | Main Terminal 2 (A2) |
| 3 | Gate |

DT16T Standard TRIACs

ELECTRICAL CHARACTERISTICS ($T_j = 25^\circ\text{C}$, unless otherwise specified.)

Absolute Ratings

| PARAMETER | SYMBOL | VALUE | UNIT |
|---|------------------------|-------------|----------------------|
| Peak repetitive off-state voltage ($T_j = -40$ to 125°C , Full sine wave, 50 to 60 Hz; Gate open) (Note 1) | V_{DRM} V_{RRM} | 800 | V |
| On-stage RMS current (Full sine wave, $T_c = 100^\circ\text{C}$) | $I_{T(RMS)}$ | 16 | A |
| Peak non-repetitive surge current (one full cycle 60 Hz, $T_j = 25^\circ\text{C}$) | I_{TSM} | 140 | A |
| Circuit fusing consideration ($t = 8.3\text{ms}$) | I^2T | 90 | A^2S |
| Operating junction temperature range | T_j | -40 to +125 | $^\circ\text{C}$ |
| Storage temperature range | T_{STG} | -40 to +150 | $^\circ\text{C}$ |

Note :

- (1) V_{DRM} and V_{RRM} for all types can be applied on a continuous basis.
Blocking voltages shall not be tested with a constant current source such that the voltage ratings of the devices are exceeded.

Version 03, NOV-2020

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CHARACTERISTIC & CURVES (T_j = 25°C, unless otherwise specified.)



Thermal Characteristics

| PARAMETER | | SYMBOL | VALUE | | UNIT |
|---|---------|----------------------|-------|-----|------|
| Thermal resistance from junction to case (1) | ITO-220 | R _{th(j-c)} | Max | 10 | °C/W |
| Junction to ambient (DC) (1) | ITO-220 | R _{th(j-L)} | Max | 9.5 | |
| Maximum lead temperature for soldering purposes (1/8" form case for 10 seconds) | | T _L | Max | 260 | °C |

Note 1: Without Heatsink

Static Characteristics

| PARAMETER | | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|---|------------------------|------------------|------|------|------|------|
| Threshold Voltage (T _j = 125°C) | | V _{to} | -- | -- | 0.95 | V |
| Dynamic resistors (T _j = 125°C) | | R _d | -- | -- | 30 | mΩ |
| Peak repetitive forward or reverse blocking current (V _{AK} = rated V _{DRM} and V _{RRM} , gate open) | T _j = 25°C | I _{DRM} | -- | -- | 5 | uA |
| | T _j = 125°C | I _{RRM} | -- | -- | 0.5 | mA |

ON Characteristics

| PARAMETER | SYMBOL | DT16T10T | DT16T35T | . | UNIT |
|---|------------------|----------|----------|-----|------|
| Peak forward on-state voltage (I _{TM} = 20 A @ T _j = 25°C) | V _{TM} | 1.5 | 1.5 | Max | V |
| V _D = V _{DRM} , R _L = 100Ω, T _j = 125°C | V _{GD} | 0.25 | 0.25 | Min | V |
| Gate trigger current (V _{AK} = 12V, R _L = 100Ω) | I _{GT1} | 10 | 35 | Max | mA |
| | I _{GT2} | 10 | 35 | | |
| | I _{GT3} | 10 | 35 | | |
| Gate trigger voltage (V _{AK} = 12V, R _L = 100Ω) | V _{GT1} | 1 | 1 | Max | V |
| | V _{GT2} | | | | |
| | V _{GT3} | | | | |
| Holding current (V _{AK} = 12V, R _L = 100Ω) | I _{H1} | 10 | 40 | Max | mA |
| | I _{H3} | | | | |
| Latching current (V _{AK} = 12V, R _L = 100Ω) | I _{L1} | 25 | 50 | Max | mA |
| | I _{L2} | 25 | 80 | | |
| | I _{L3} | 25 | 50 | | |

Dynamic Characteristics

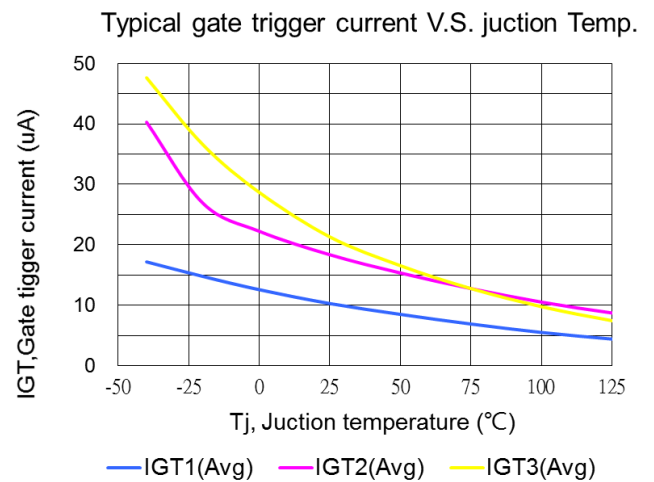
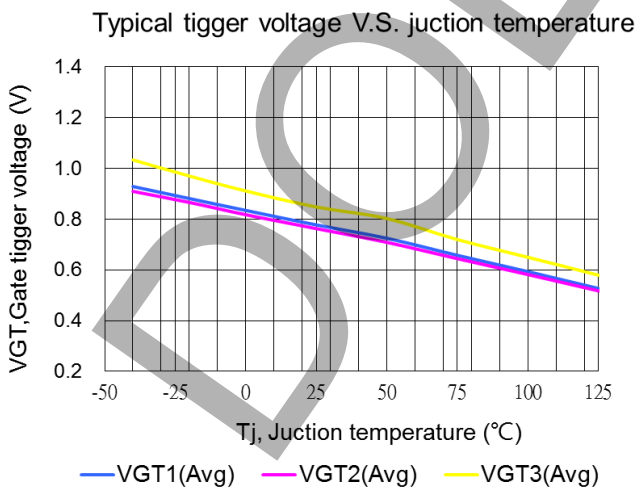
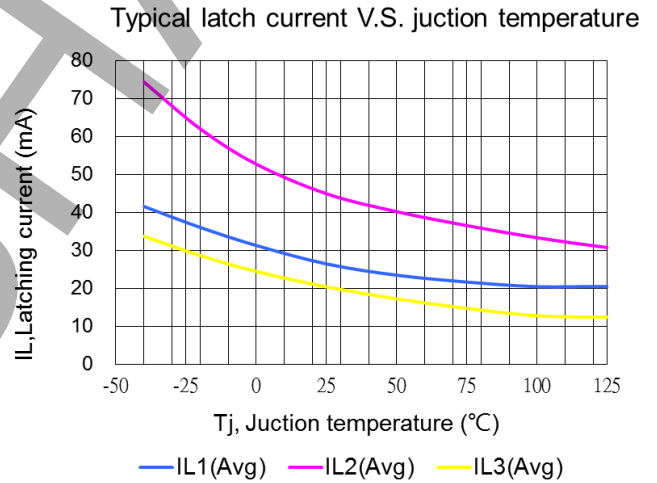
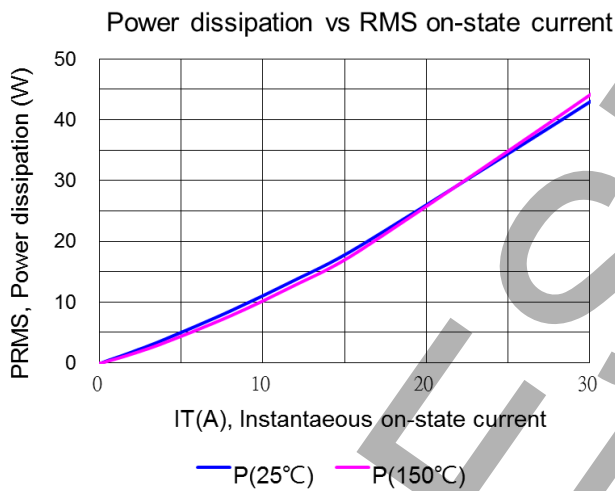
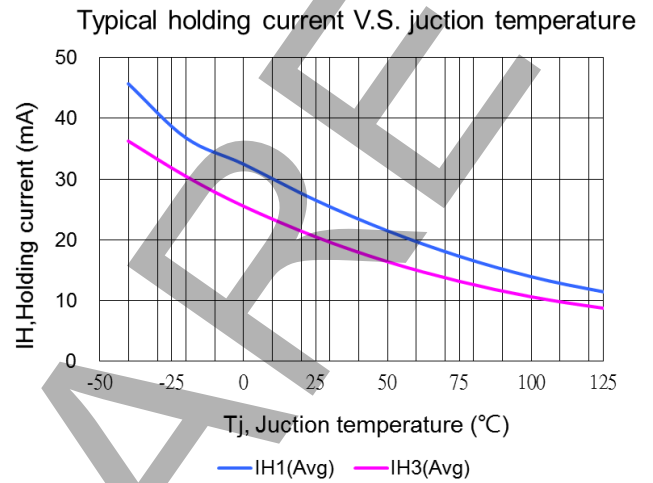
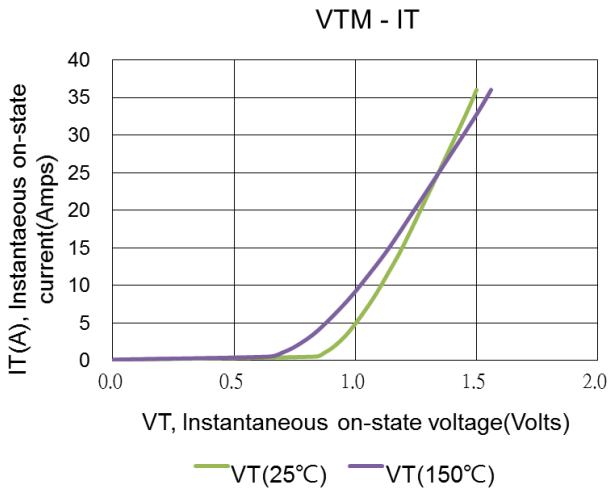
| PARAMETER | SYMBOL | MIN. | TYP. | | UNIT |
|---|----------|------|------|-----|------|
| Critical rate of rise of off-stage voltage (V _{AK} = 67% rated V _{DRM} , T _j = 125°C, gate open) | dv/dt | 500 | 2000 | Max | V/us |
| Critical rate of rise of on-state current, (V _{DRM} = maximum V _{DRM} , T _j = 125°C) | di/dt(s) | 70 | 70 | Max | A/us |
| 125°C, Gate open, without snubber | di/dt(c) | 2.5 | 4 | Max | A/ms |

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CHARACTERISTIC & CURVES (Tj = 25°C, unless otherwise specified.)



DT16T35 Characteristics



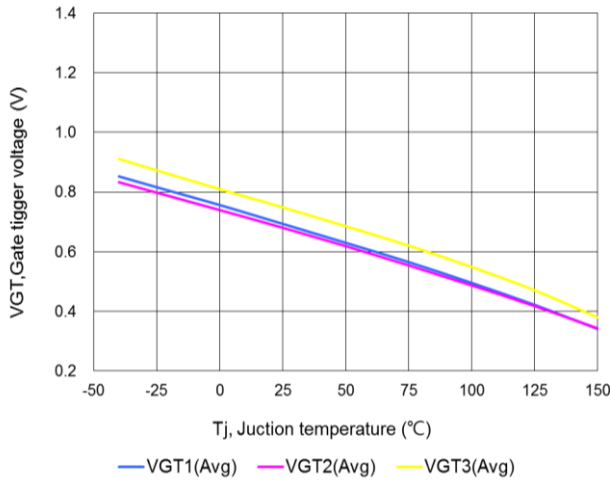
DT16T Standard TRIACs

CHARACTERISTIC & CURVES (Tj = 25°C, unless otherwise specified.)

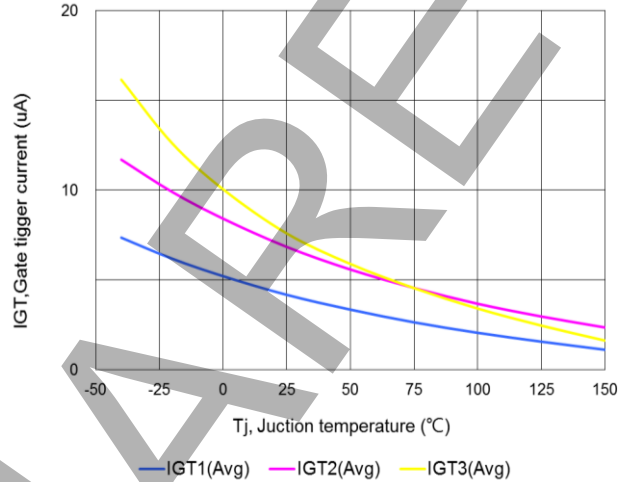


DT16T10 Characteristics

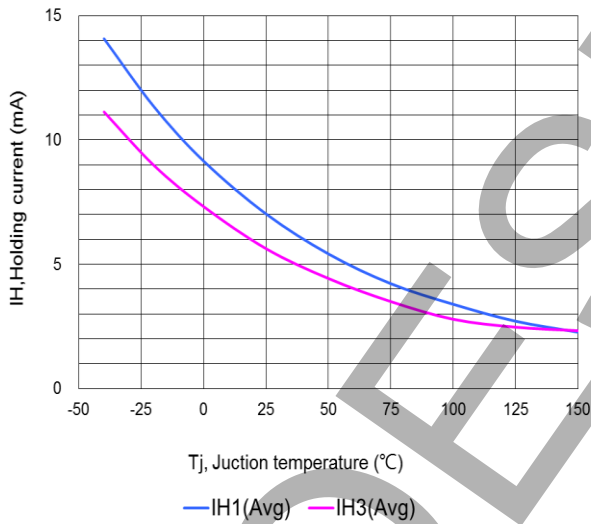
Typical gate trigger voltage V.S. junction temperature



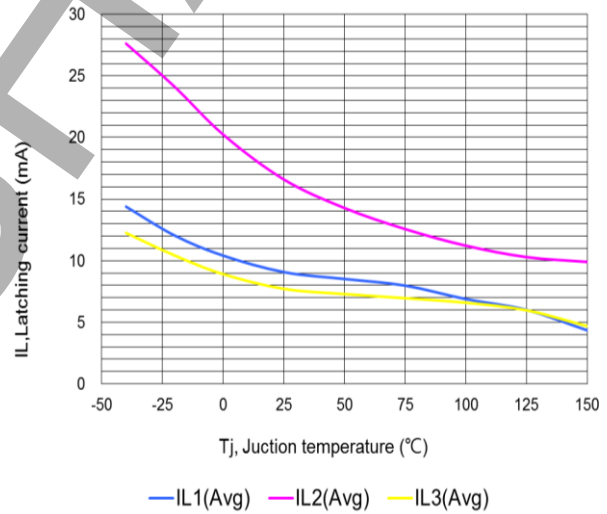
Typical gate trigger current V.S. junction temperature



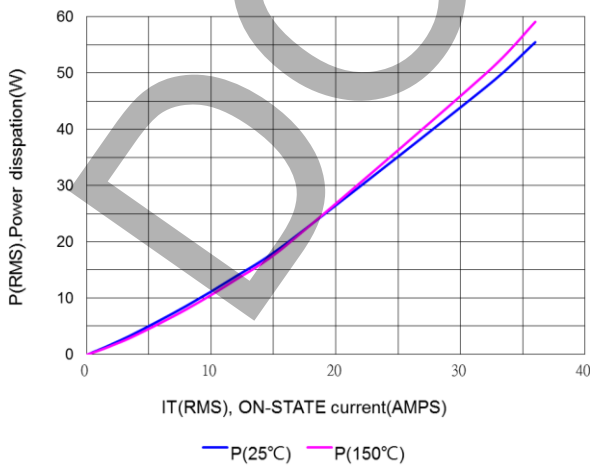
Typical holding current V.S. junction temperature



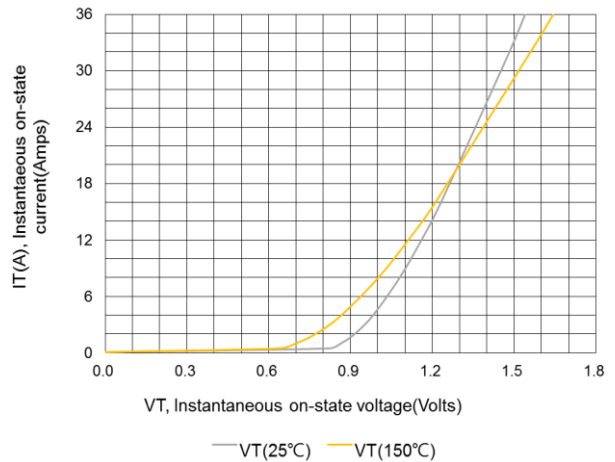
Typical latch current V.S. junction temperature



Power dissipation VS ON-STATE current



VTM - IT

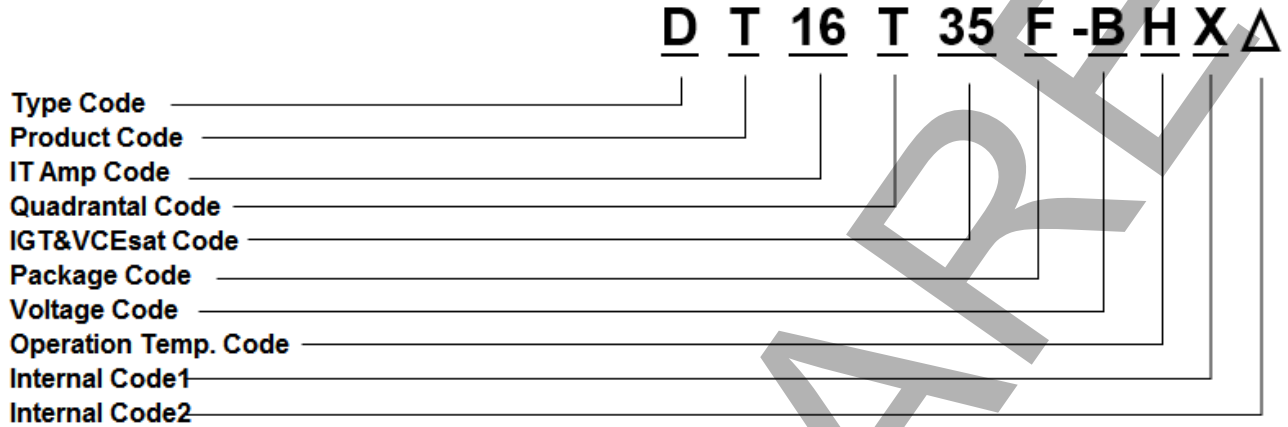


DT16T Standard TRIACs

CHARACTERISTIC & CURVES (Tj = 25°C, unless otherwise specified.)



Ordering information scheme

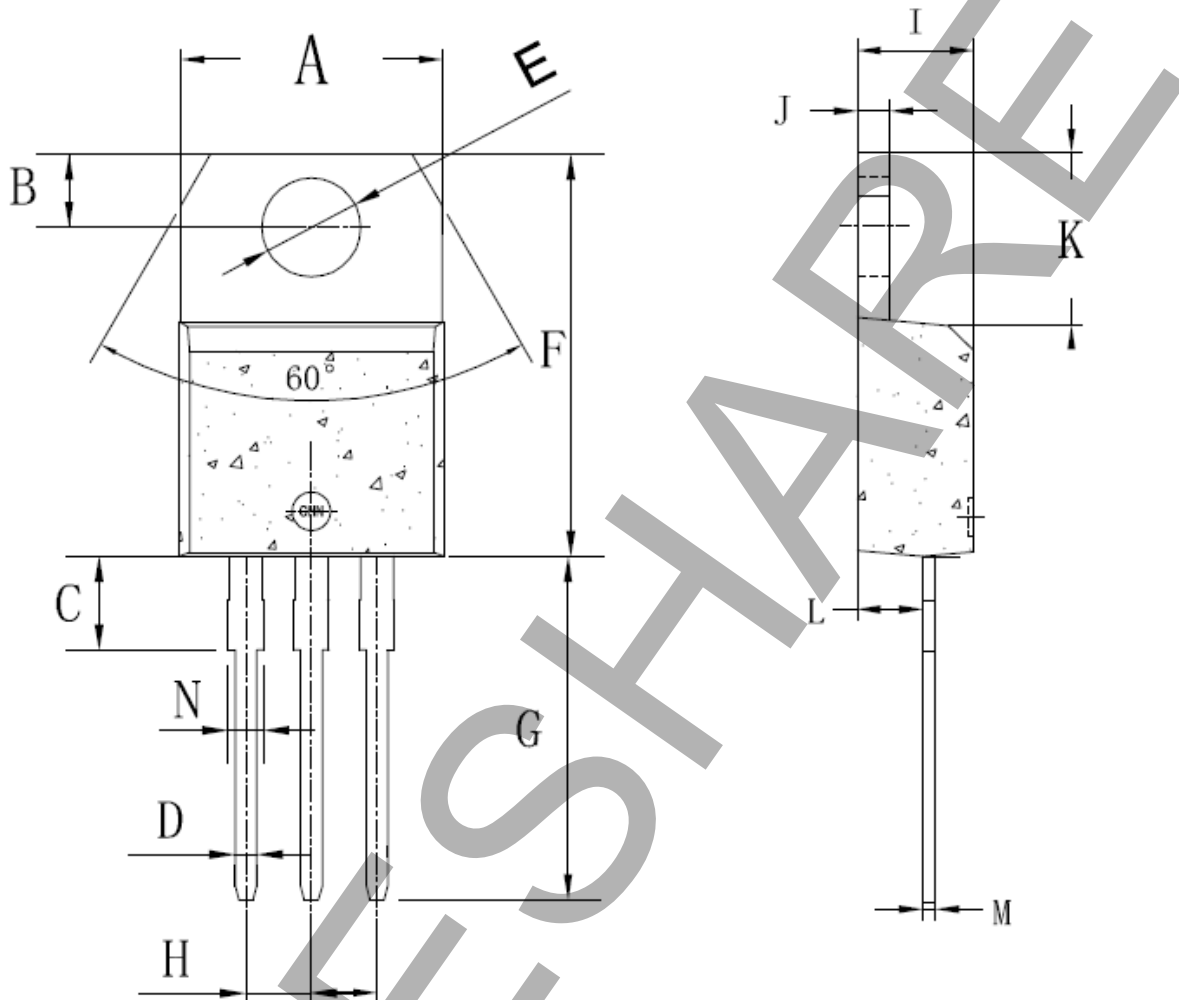


- Type Code: Doeshare Standar products
- Product Code: T for Triac series
- IT Amp Code: 16 for 16A, 1 for 1A
- Quadrantal Code: T for 3Q, F for 4Q
- IGT&VCEsat Code: 35 means Igt 35mA, 5 means Igt 5mA
- Package Code: A=>TO-92, C=>TO-126, D=> DPAK, E=>D2PAK, F=> TO-220F, G=>SOT-223
M=>ITO-3P, P=>TO-3P, T=> TO-220, Y=>TO251, X=> TO-3P-L
- Voltage Code: A=> 600V, B=> 800V, C=> 1000V
- Operation Temp Code: None=>125°C, H=>150°C

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CHARACTERISTIC & CURVES ($T_j = 25^\circ\text{C}$, unless otherwise specified.)

ITO-220 Plastic Package



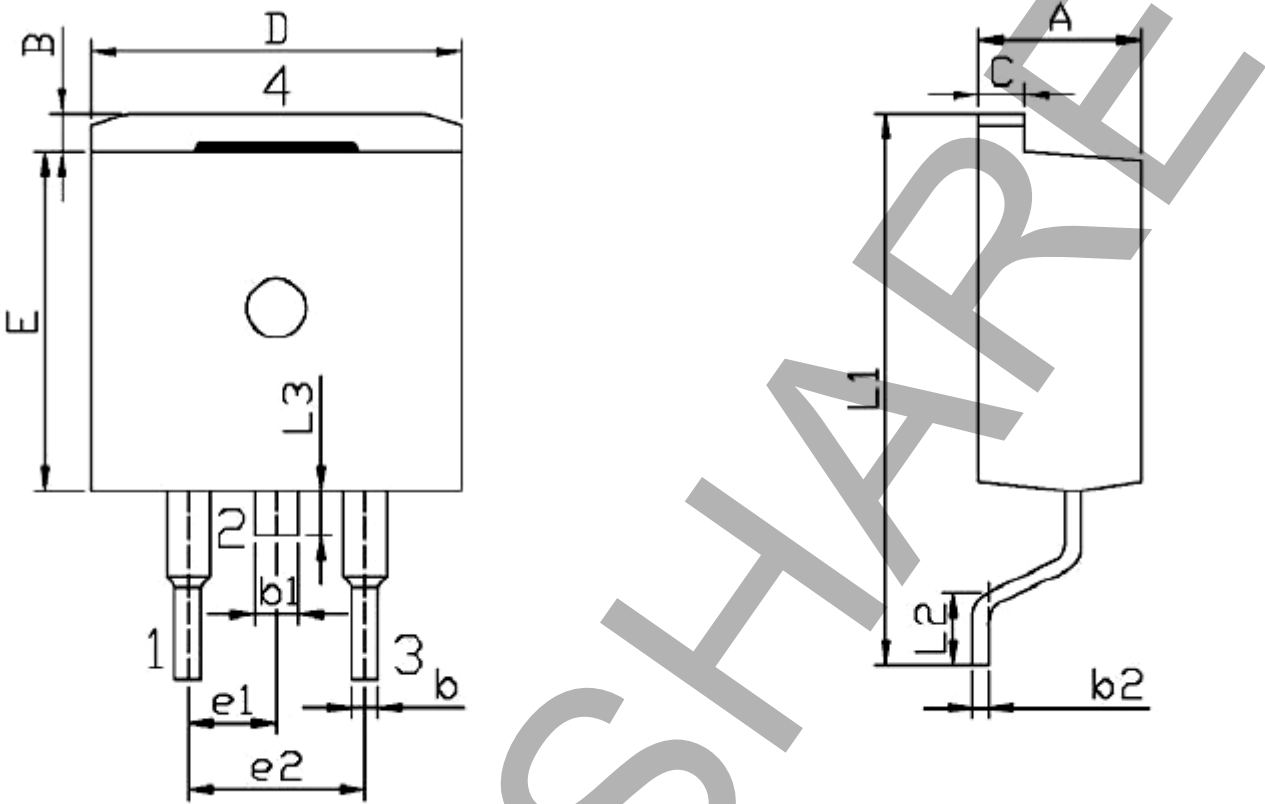
| DIM | Millimeters | | DIM | Millimeters | | DIM | Millimeters | |
|-----|-------------|------|-----|-------------|------|-----|-------------|------|
| | Min | Max | | Min | Max | | Min | Max |
| A | 9.8 | 10.4 | E | 3.75 | 3.95 | I | 4.38 | 4.61 |
| B | 2.65 | 3.1 | F | 14.8 | 16.1 | J | 1.15 | 1.36 |
| C | 2.8 | 4.2 | G | 13.05 | 13.6 | K | 5.85 | 6.82 |
| D | 0.7 | 0.92 | H | 2.4 | 2.7 | L | 2.35 | 2.75 |
| M | 0.35 | 0.65 | N | 1.18 | 1.42 | | | |

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CHARACTERISTIC & CURVES (T_j = 25°C, unless otherwise specified.)



D2PAK Plastic Package

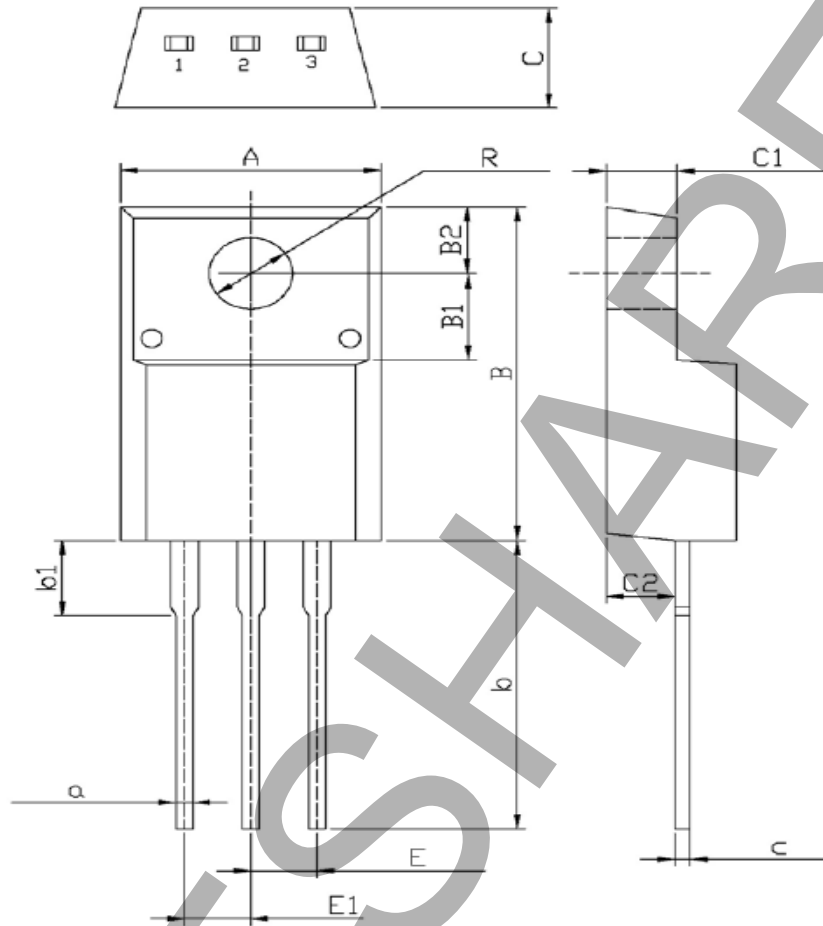


| Symbol | Dimensions In Millimeters | | Symbol | Dimensions In Millimeters | |
|--------|---------------------------|-------|--------|---------------------------|-------|
| | Min | Max | | Min | Max |
| A | 4.30 | 4.70 | E | 9.00 | 9.40 |
| B | 1.00 | 1.40 | e1 | 2.34 | 2.74 |
| b | 0.70 | 0.90 | e2 | 4.88 | 5.28 |
| b1 | 1.15 | 1.35 | L1 | 15.00 | 16.00 |
| b2 | 0.40 | 0.60 | L2 | 2.24 | 2.84 |
| C | 1.20 | 1.40 | L3 | 1.20 | 1.60 |
| D | 9.80 | 10.20 | | | |

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CHARACTERISTIC & CURVES (T_j = 25°C, unless otherwise specified.)

TO-220F Plastic Package

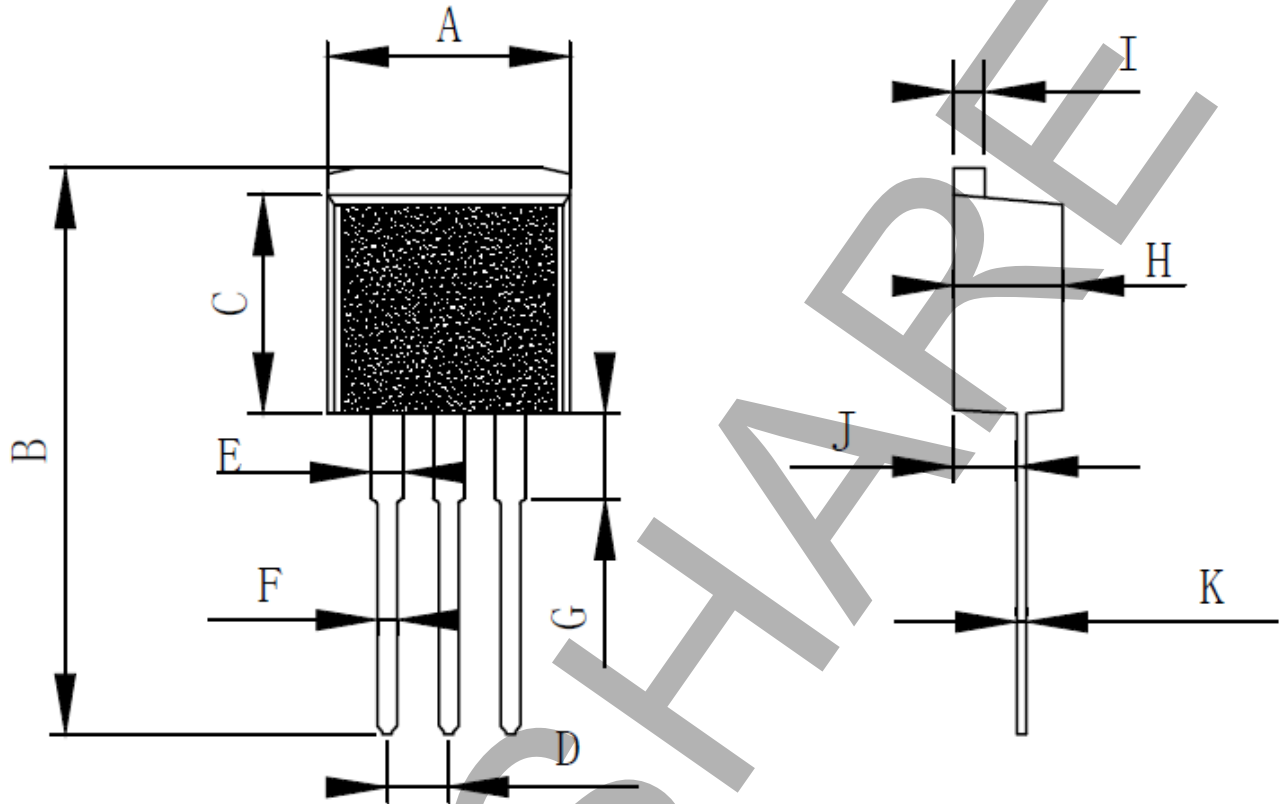


| DIM | Millimeters | | DIM | Millimeters | | DIM | Millimeters | |
|-----|-------------|------|-----|-------------|------|-----|-------------|------|
| | Min | Max | | Min | Max | | Min | Max |
| A | 9.7 | 10.3 | E | 2.29 | 2.79 | b | 12.5 | 13.5 |
| B | 14.7 | 15.3 | E1 | 2.29 | 2.79 | b1 | 2.9 | 3.9 |
| C | 4.3 | 4.7 | B1 | 3.8 | 4.0 | a | 0.55 | 0.75 |
| C1 | 2.5 | 2.9 | B2 | 2.9 | 3.1 | c | 0.5 | 0.7 |
| C2 | 2.5 | 2.7 | R | 3.0 | 3.4 | | | |

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CHARACTERISTIC & CURVES ($T_j = 25^\circ\text{C}$, unless otherwise specified.)

TO-262 Plastic Package

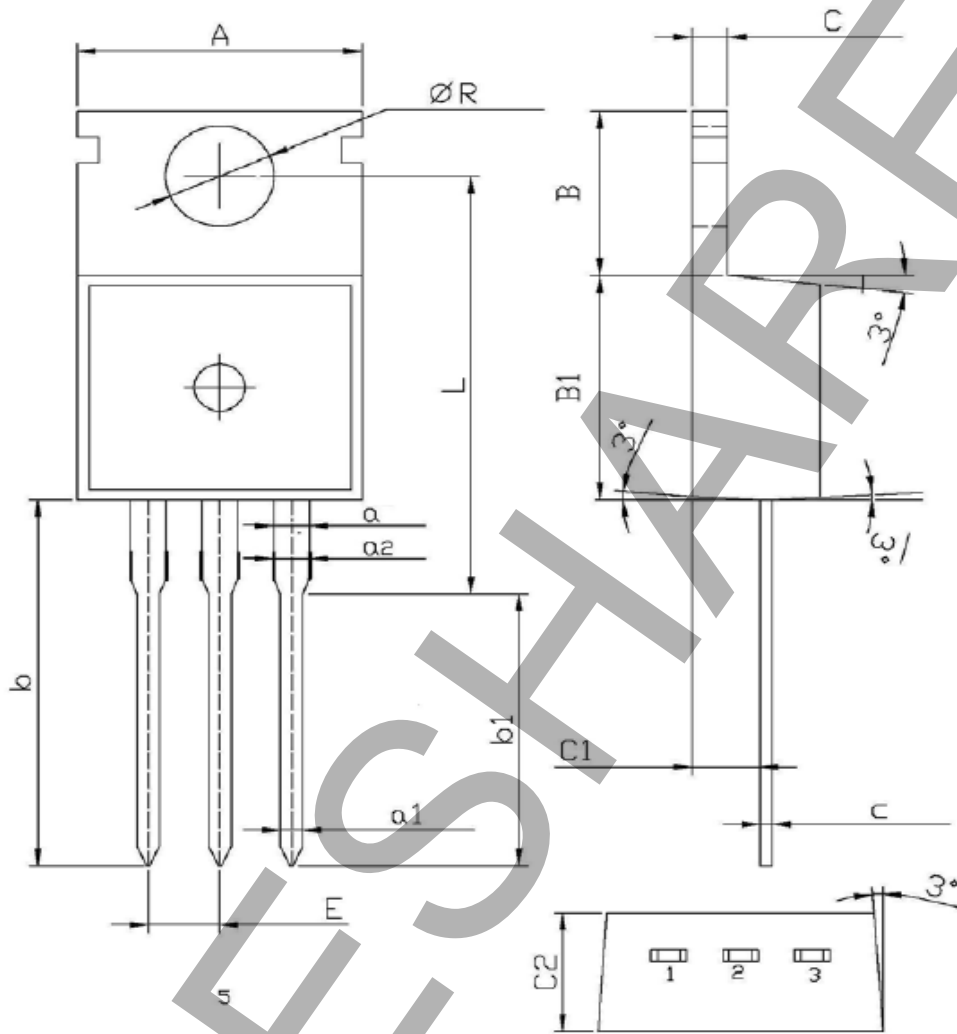


| Item | Unit: mm | | |
|------|----------|-------|-------|
| | Type | Min | Max |
| A | 10 | 9.95 | 10.2 |
| B | 23.35 | 23.25 | 23.45 |
| C | 9 | 8.9 | 9.1 |
| D | 2.54 | 2.5 | 2.6 |
| E | 1.27 | 1.2 | 1.35 |
| F | 0.8 | 0.75 | 0.85 |
| G | 3.5 | 3.3 | 3.6 |
| H | 4.5 | 4.45 | 4.55 |
| I | 1.27 | 1.25 | 1.29 |
| J | 2.6 | 2.5 | 2.7 |
| K | 0.4 | 0.38 | 0.42 |

DT16T Standard TRIACs

CHARACTERISTIC & CURVES (Tj = 25°C, unless otherwise specified.)

TO-220 Plastic Package



| DIM | Millimeters | | DIM | Millimeters | | DIM | Millimeters | |
|-----|-------------|------|-----|-------------|------|-----|-------------|-------|
| | Min | Max | | Min | Max | | Min | Max |
| A | 9.7 | 10.4 | a | 1.22 | 1.32 | a2 | 1.18 | 1.45 |
| B | 6.13 | 6.82 | a1 | 0.7 | 0.92 | C2 | 4.3 | 4.71 |
| C | 1.2 | 1.42 | b1 | 9.6 | 10.6 | E | 2.34 | 2.74 |
| B1 | 9.0 | 9.4 | c | 0.38 | 0.65 | R | 3.55 | 3.78 |
| b | 12.6 | 13.6 | C1 | 2.2 | 2.75 | L | 15.7 | 16.14 |

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CHARACTERISTIC & CURVES (Tj = 25°C, unless otherwise specified.)



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