



THE DATASHEET OF MOC208R2M



MOC205-M

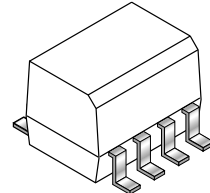
MOC206-M

MOC207-M

MOC208-M

DESCRIPTION

These devices consist of a gallium arsenide infrared emitting diode optically coupled to a monolithic silicon phototransistor detector, in a surface mountable, small outline, plastic package. They are ideally suited for high density applications, and eliminate the need for through - the - board mounting.

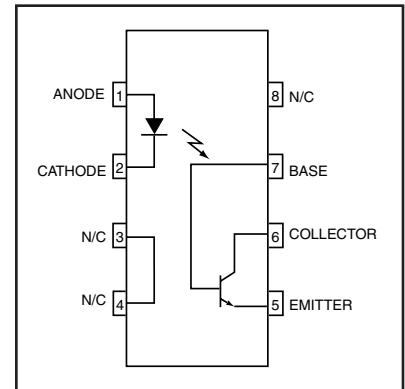


FEATURES

- U.L. Recognized (File #E90700, Volume 2)
- VDE Recognized (File #136616) (add option "V" for VDE approval, i.e, MOC205V-M)
- Closely Matched Current Transfer Ratios
- Convenient Plastic SOIC-8 Surface Mountable Package Style
- Minimum BV_{CEO} of 70 Volts Guaranteed
- Standard SOIC-8 Footprint, with 0.050" Lead Spacing
- Compatible with Dual Wave, Vapor Phase and IR Reflow Soldering
- High Input-Output Isolation of 2500 $V_{AC(rms)}$ Guaranteed

APPLICATIONS

- Feedback Control Circuits
- Interfacing and coupling systems of different potentials and impedances
- General Purpose Switching Circuits
- Monitor and Detection Circuits



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| ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ Unless otherwise specified) | | | |
|--|---------------|--------------|----------------------------|
| Rating | Symbol | Value | Unit |
| EMITTER | | | |
| Forward Current - Continuous | I_F | 60 | mA |
| Forward Current - Peak (PW = 100 μs , 120 pps) | I_F (pk) | 1.0 | A |
| Reverse Voltage | V_R | 6.0 | V |
| LED Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C | P_D | 90 0.8 | mW mW/ $^\circ\text{C}$ |
| DETECTOR | | | |
| Collector-Emitter Voltage | V_{CEO} | 70 | V |
| Emitter-Collector Voltage | V_{ECO} | 7.0 | V |
| Collector-Base Voltage | V_{CBO} | 70 | V |
| Collector Current-Continuous | I_C | 150 | mA |
| Detector Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C | P_D | 150 1.76 | mW mW/ $^\circ\text{C}$ |
| TOTAL DEVICE | | | |
| Input-Output Isolation Voltage (1,2,3) (f = 60 Hz, t = 1 min.) | V_{ISO} | 2500 | Vac(rms) |
| Total Device Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C | P_D | 250 2.94 | mW mW/ $^\circ\text{C}$ |
| Ambient Operating Temperature Range | T_A | -40 to +100 | $^\circ\text{C}$ |
| Storage Temperature Range | T_{stg} | -40 to +150 | $^\circ\text{C}$ |

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| ELECTRICAL CHARACTERISTICS (T _A = 25°C unless otherwise specified) | | | | | | |
|---|--|----------------------|-----------------------|------------------|-------------------------|----------|
| Parameter | Test Conditions | Symbol | Min | Typ** | Max | Unit |
| EMITTER | | | | | | |
| Input Forward Voltage | (I _F = 10 mA) | V _F | — | 1.15 | 1.5 | V |
| Reverse Leakage Current | (V _R = 6.0 V) | I _R | — | 0.001 | 100 | μA |
| Input Capacitance | | C _{IN} | — | 18 | — | pF |
| DETECTOR | | | | | | |
| Collector-Emitter Dark Current | (V _{CE} = 10 V, T _A = 25°C) | I _{CEO1} | — | 1.0 | 50 | nA |
| | (V _{CE} = 10 V, T _A = 100°C) | I _{CEO2} | — | 1.0 | — | μA |
| Collector-Emitter Breakdown Voltage | (I _C = 100 μA) | BV _{CEO} | 70 | 100 | — | V |
| Emitter-Collector Breakdown Voltage | (I _E = 100 μA) | BV _{ECCO} | 7.0 | 10 | — | V |
| Collector-Emitter Capacitance | (f = 1.0 MHz, V _{CE} = 0) | C _{CE} | — | 7.0 | — | pF |
| COUPLED | | | | | | |
| Collector-Output Current ⁽⁴⁾ | MOC205-M MOC206-M MOC207-M MOC208-M (I _F = 10 mA, V _{CE} = 10 V) | CTR | 40 63 100 40 | — — — — | 80 125 200 125 | % |
| Isolation Surge Voltage ^(1,2,3) | (f = 60 Hz AC Peak, t = 1 min.) | V _{ISO} | 2500 | — | — | Vac(rms) |
| Isolation Resistance ⁽²⁾ | (V = 500 V) | R _{ISO} | 10 ¹¹ | — | — | Ω |
| Collector-Emitter Saturation Voltage | (I _C = 2 mA, I _F = 10 mA) | V _{CE(sat)} | — | — | 0.4 | V |
| Isolation Capacitance ⁽²⁾ | (V = 0 V, f = 1 MHz) | C _{ISO} | — | 0.2 | — | pF |
| Turn-On Time | (I _C = 2.0 mA, V _{CC} = 10 V, R _L = 100 Ω) (Fig. 6) | t _{on} | — | 7.5 | — | μs |
| Turn-Off Time | (I _C = 2.0 mA, V _{CC} = 10 V, R _L = 100 Ω) (Fig. 6) | t _{off} | — | 5.7 | — | μs |
| Rise Time | (I _C = 2.0 mA, V _{CC} = 10 V, R _L = 100 Ω) (Fig. 6) | t _r | — | 3.2 | — | μs |
| Fall Time | (I _C = 2.0 mA, V _{CC} = 10 V, R _L = 100 Ω) (Fig. 6) | t _f | — | 4.7 | — | μs |

** Typical values at T_A = 25°C

1. Isolation Surge Voltage, V_{ISO}, is an internal device dielectric breakdown rating.
2. For this test, Pins 1 and 2 are common and Pins 5, 6 and 7 are common.
3. V_{ISO} rating of 2500 V_{AC(rms)} for t = 1 min. is equivalent to a rating of 3,000 V_{AC(rms)} for t = 1 sec.
4. Current Transfer Ratio (CTR) = I_C/I_F x 100%.

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Fig. 1 LED Forward Voltage vs. Forward Current

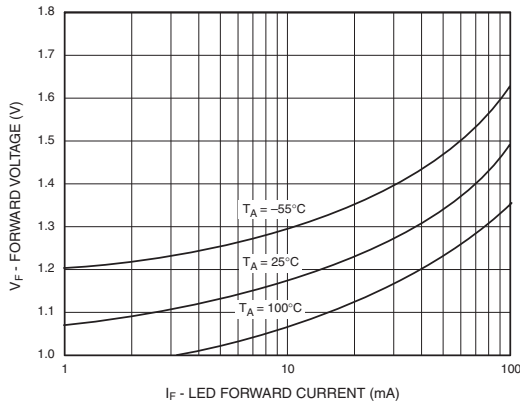


Fig. 2 Output Current vs. Input Current

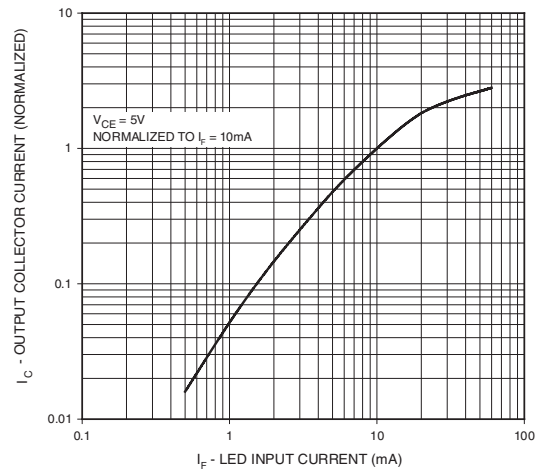


Fig. 3 Output Current vs. Ambient Temperature

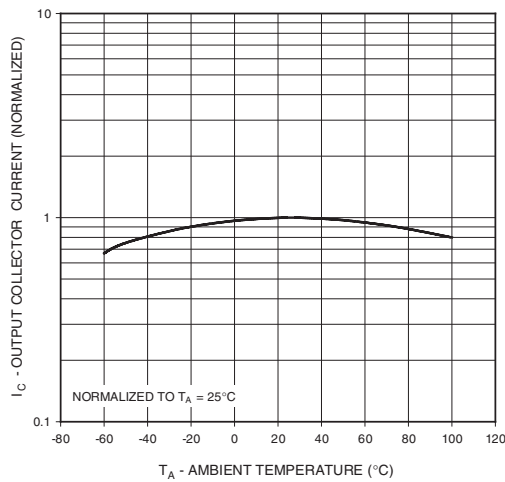


Fig. 4 Output Current vs. Collector - Emitter Voltage

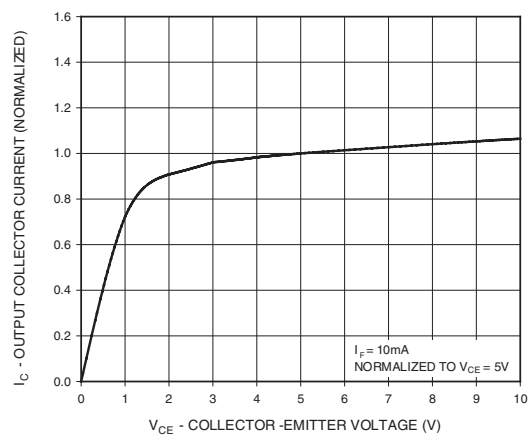


Fig. 5 Dark Current vs. Ambient Temperature

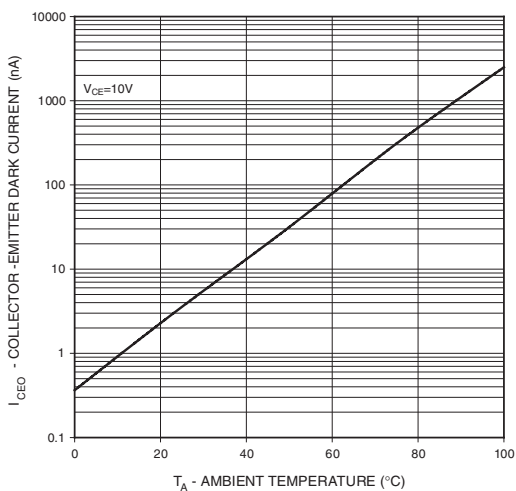
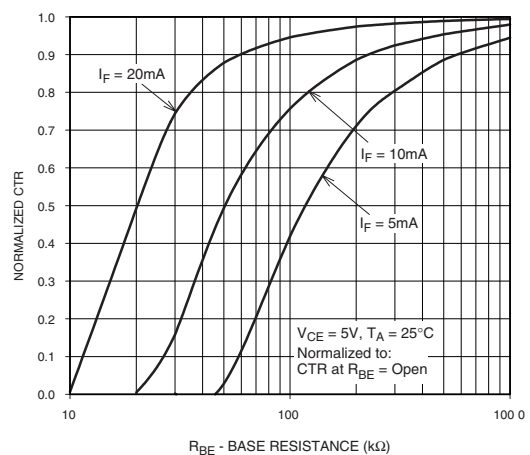


Fig. 6 CTR vs. R_{BE} (Unsaturated)



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Fig. 7 CTR vs. R_{BE} (Saturated)

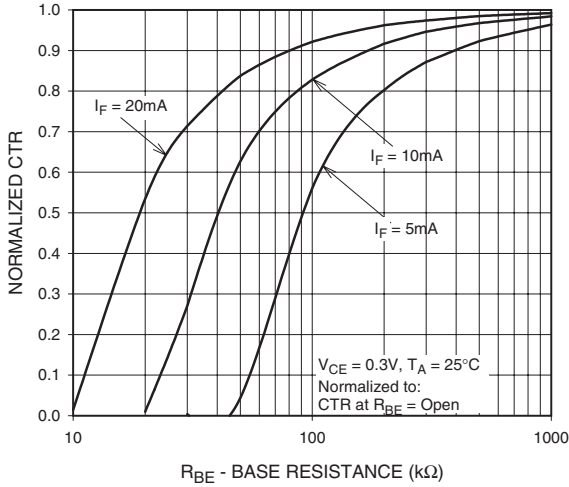


Fig. 8 Normalized t_{on} vs. R_{BE}

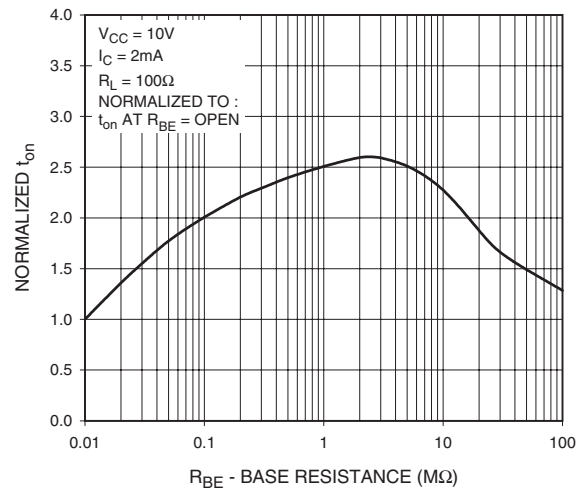
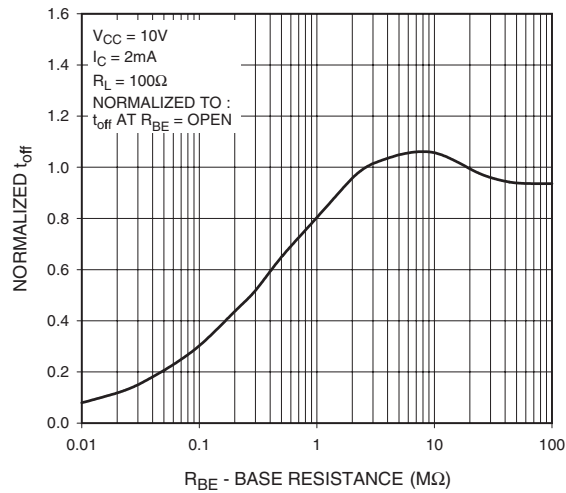


Fig. 9 Normalized t_{off} vs. R_{BE}



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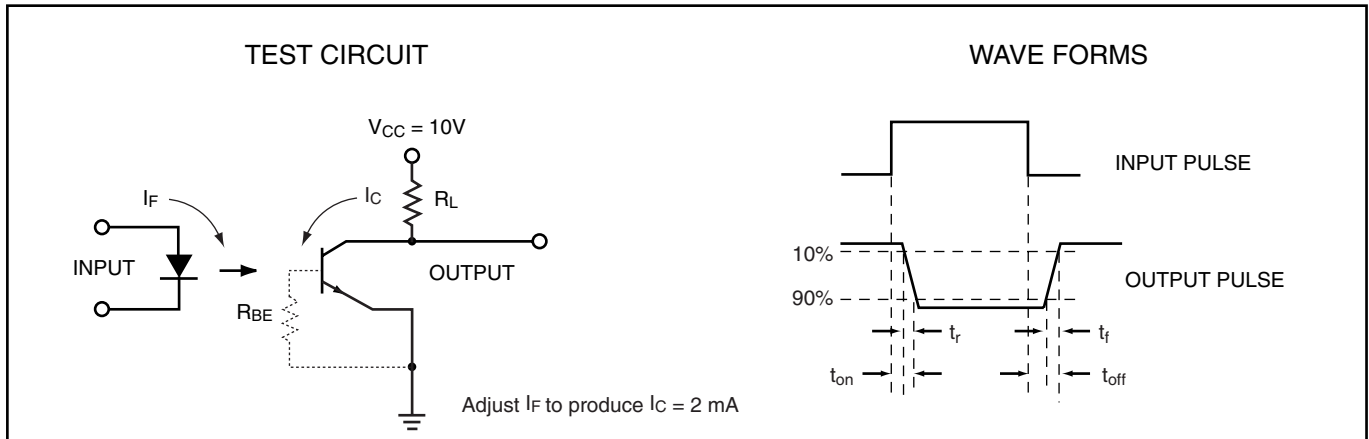


Figure 6. Switching Time Test Circuit and Waveforms

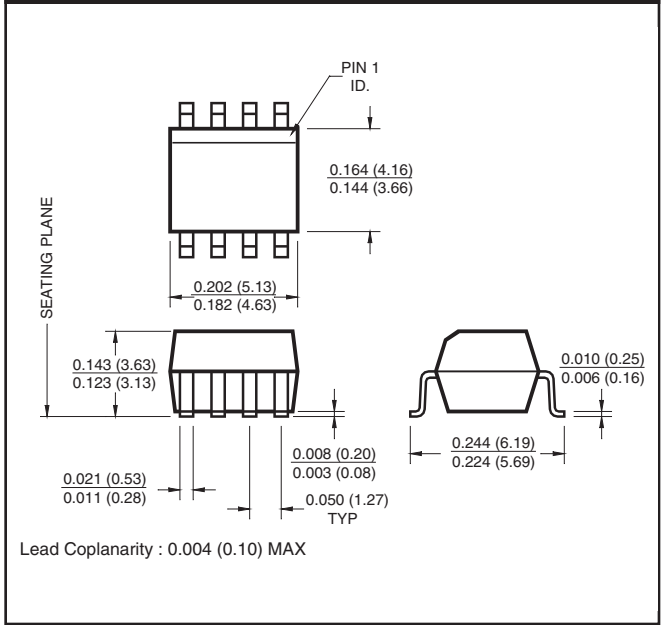
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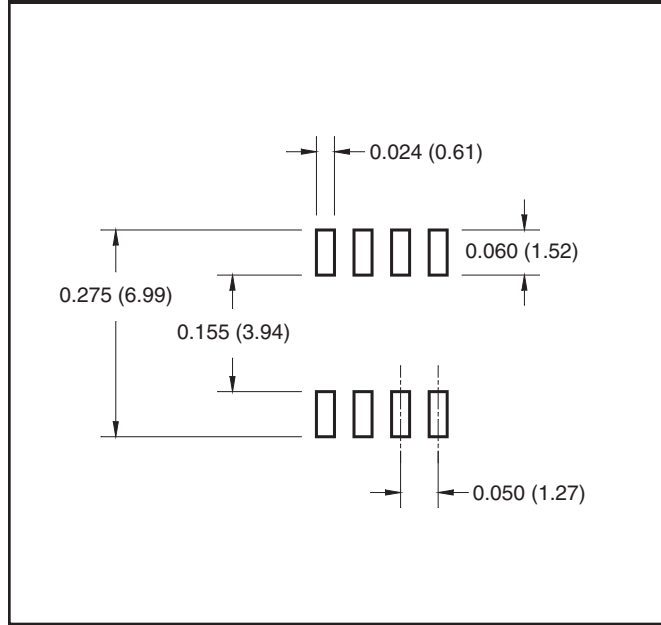
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Package Dimensions (Surface Mount)



8-Pin Small Outline



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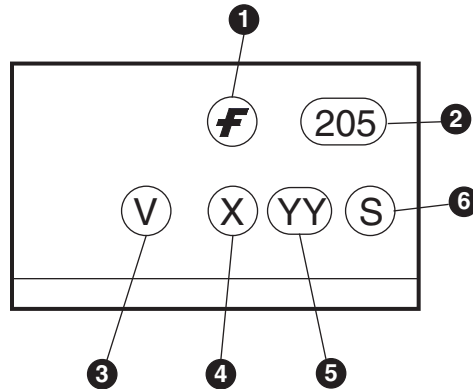
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ORDERING INFORMATION

| Option | Order Entry Identifier | Description |
|--------|------------------------|---|
| V | V | VDE 0884 |
| R1 | R1 | Tape and reel (500 units per reel) |
| R1V | R1V | VDE 0884, Tape and reel (500 units per reel) |
| R2 | R2 | Tape and reel (2500 units per reel) |
| R2V | R2V | VDE 0884, Tape and reel (2500 units per reel) |

MARKING INFORMATION



| Definitions | |
|-------------|--|
| 1 | Fairchild logo |
| 2 | Device number |
| 3 | VDE mark (Note: Only appears on parts ordered with VDE option – See order entry table) |
| 4 | One digit year code, e.g., '3' |
| 5 | Two digit work week ranging from '01' to '53' |
| 6 | Assembly package code |

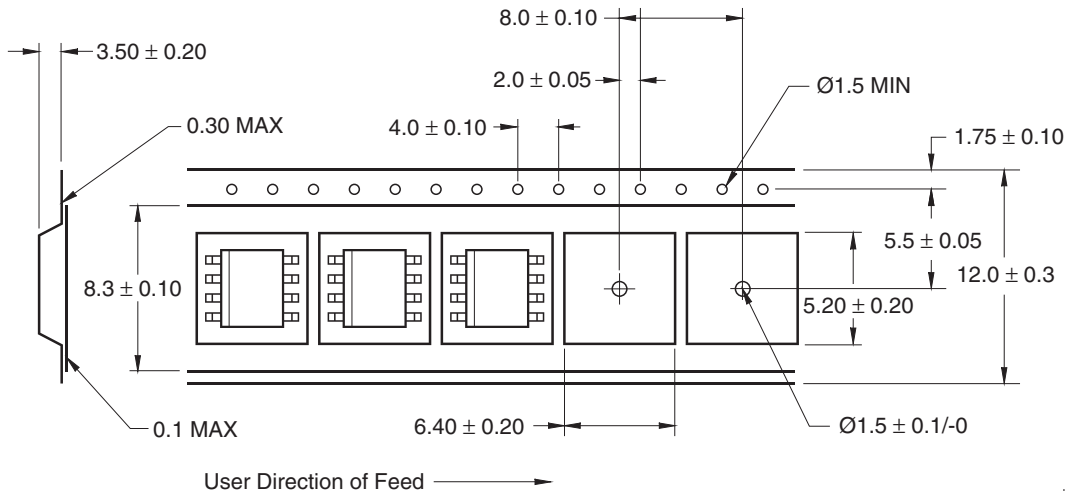
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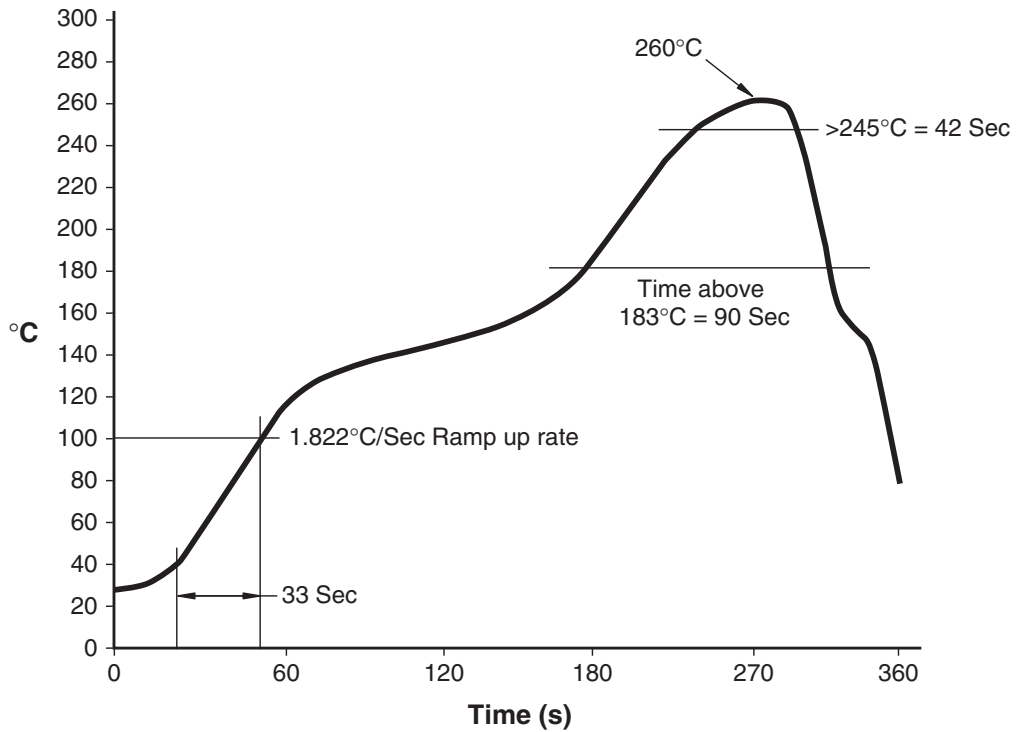
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Carrier Tape Specifications



Reflow Profile



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