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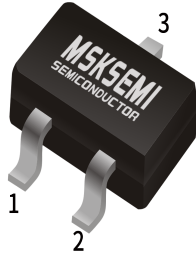


GDT



PLED

Product data sheet

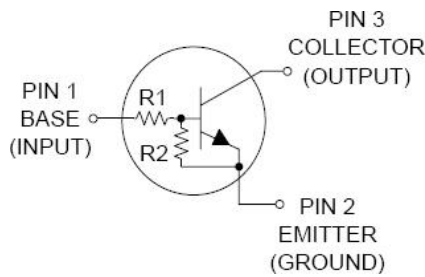


SOT-523

Features:

- Simplifies Circuit Design
- Reduces Board Space
- Reduces Component Count
- RoHS Compliant
- Green EMC
- Matte Tin(Sn) Lead Finish
- Weight: approx. 0.002g

Electrical Symbol:



Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ unless otherwise noted)

| Symbol | Parameter | Value | Units |
|-----------------|---|-------------|-----------------------------|
| V_{CBO} | Collector-Base Voltage | 50 | V |
| V_{CEO} | Collector-Emitter Voltage | 50 | V |
| I_C | Collector Current | 100 | mA |
| P_D | Power Dissipation | 150 | mW |
| $R_{\theta JA}$ | Thermal Resistance from Junction to Ambient | 600 | $^\circ\text{C} / \text{W}$ |
| $T_J T_{STG}$ | Junction & Storage Temperature Range | -55 to +150 | $^\circ\text{C}$ |

These ratings are limiting values above which the serviceability of the device may be impaired.

Device Marking & Resistor Values:

| P/N | Mark | R1 (KΩ) | R2 (KΩ) |
|-------------|------|---------|---------|
| DTC114EE-MS | 24 | 10 | 10 |
| DTC124EE-MS | 25 | 22 | 22 |
| DTC144EE-MS | 26 | 47 | 47 |
| DTC114YE-MS | 64 | 10 | 47 |
| DTC114TE-MS | 04 | 10 | ∞ |
| DTC143TE-MS | 03 | 4.7 | ∞ |
| DTC123EE-MS | 22 | 2.2 | 2.2 |
| DTC143EE-MS | 23 | 4.7 | 4.7 |
| DTC143ZE-MS | E23 | 4.7 | 47 |
| DTC124XE-MS | 45 | 22 | 47 |
| DTC123JE-MS | E42 | 2.2 | 47 |

Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Off Characteristics

| Symbol | Parameter | Test Condition | Limits | | | Unit |
|---------------|--|---|--------|-----|------|-------|
| | | | Min | Typ | Max | |
| I_{CBO} | Collector-Base Cutoff Current | $V_{CB} = 50\text{V}, I_E = 0\text{A}$ | - | - | 100 | nA |
| I_{CEO} | Collector-Emitter Cutoff Current | $V_{CE} = 50\text{V}, I_B = 0\text{A}$ | - | - | 500 | nA |
| I_{EBO} | Emitter-Base Cutoff Current | $V_{EB} = 6.0\text{V}, I_C = 0\text{A}$ | | | | |
| | DTC114EE-MS | | - | - | 0.50 | mA |
| | DTC124EE-MS | | - | - | 0.20 | |
| | DTC144EE-MS | | - | - | 0.10 | |
| | DTC114YE-MS | | - | - | 0.20 | |
| | DTC114TE-MS | | - | - | 0.90 | |
| | DTC143TE-MS | | - | - | 1.90 | |
| | DTC123EE-MS | | - | - | 2.30 | |
| | DTC143EE-MS | | - | - | 1.50 | |
| | DTC143ZE-MS | | - | - | 0.18 | |
| | DTC124XE-MS | | - | - | 0.13 | |
| | DTC123JE-MS | | - | - | 0.20 | |
| $V_{(BR)CBO}$ | Collector-Base Breakdown Voltage | $I_C = 10\mu\text{A}, I_E = 0\text{A}$ | 50 | - | - | Volts |
| $V_{(BR)CEO}$ | Collector-Emitter Breakdown Voltage (Note 1) | $I_C = 2.0\text{mA}, I_B = 0\text{A}$ | 50 | - | - | Volts |

Note 1: Pulse Test. Pulse width <300us, Duty cycle < 2.0%

On Characteristics (Note 1)

| Symbol | Parameter | Test Condition | Limits | | | Unit |
|----------------------------|--------------------------------------|---|--------|-----|------|-------|
| | | | Min | Typ | Max | |
| H_{FE} | DC Current Gain | V _{CE} = 10V, I _C = 5.0mA | | | | |
| | DTC114EE-MS | | 35 | 60 | -- | |
| | DTC124EE-MS | | 60 | 100 | -- | |
| | DTC144EE-MS | | 80 | 140 | -- | |
| | DTC114YE-MS | | 80 | 140 | -- | |
| | DTC114TE-MS | | 160 | 350 | -- | |
| | DTC143TE-MS | | 160 | 350 | -- | |
| | DTC123EE-MS | | 8.0 | 15 | -- | |
| | DTC143EE-MS | | 15 | 30 | -- | |
| | DTC143ZE-MS | | 80 | 200 | -- | |
| | DTC124XE-MS | | 80 | 150 | -- | |
| | DTC123JE-MS | | 80 | 140 | -- | |
| V_{CE(sat)} | Collector-Emitter Saturation Voltage | | | | | |
| | DTC114EE-MS | I _C = 10mA, I _B = 0.3mA | | | | |
| | DTC124EE-MS | I _C = 10mA, I _B = 0.3mA | | | | |
| | DTC144EE-MS | I _C = 10mA, I _B = 0.3mA | | | | |
| | DTC114YE-MS | I _C = 10mA, I _B = 0.3mA | | | | |
| | DTC114TE-MS | I _C = 10mA, I _B = 1mA | -- | -- | 0.25 | Volts |
| | DTC143TE-MS | I _C = 10mA, I _B = 1mA | | | | |
| | DTC123EE-MS | I _C = 10mA, I _B = 5mA | | | | |
| | DTC143EE-MS | I _C = 10mA, I _B = 1mA | | | | |
| | DTC143ZE-MS | I _C = 10mA, I _B = 1mA | | | | |
| | DTC124XE-MS | I _C = 10mA, I _B = 1mA | | | | |
| | DTC123JE-MS | I _C = 10mA, I _B = 0.3mA | | | | |
| V_{OL} | Output Voltage (on) | R _L = 1.0KΩ | | | | |
| | DTC114EE-MS | V _{CC} = 5.0V, V _B = 2.5V | | | | |
| | DTC124EE-MS | V _{CC} = 5.0V, V _B = 2.5V | | | | |
| | DTC144EE-MS | V _{CC} = 5.0V, V _B = 3.5V | | | | |
| | DTC114YE-MS | V _{CC} = 5.0V, V _B = 2.5V | | | | |
| | DTC114TE-MS | V _{CC} = 5.0V, V _B = 2.5V | -- | -- | 0.20 | Volts |
| | DTC143TE-MS | V _{CC} = 5.0V, V _B = 2.5V | | | | |
| | DTC123EE--MS | V _{CC} = 5.0V, V _B = 2.5V | | | | |
| | DTC143EE--MS | V _{CC} = 5.0V, V _B = 2.5V | | | | |
| | DTC143ZE--MS | V _{CC} = 5.0V, V _B = 2.5V | | | | |
| | DTC124XE--MS | V _{CC} = 5.0V, V _B = 2.5V | | | | |
| | DTC123JE--MS | V _{CC} = 5.0V, V _B = 2.5V | | | | |

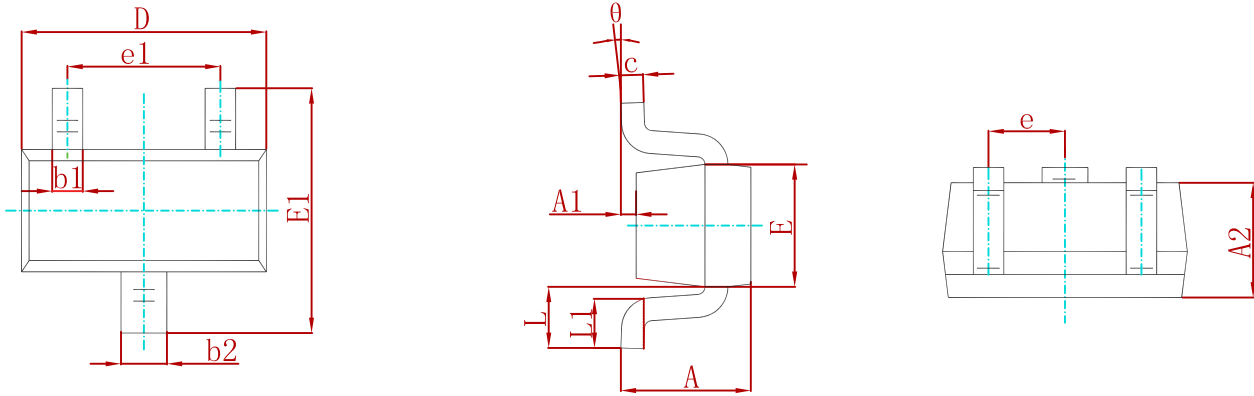
On Characteristics

| Symbol | Parameter | Test Condition | Limits | | | Unit |
|-----------------|---------------------|---|--------|-----|-----|-------|
| | | | Min | Typ | Max | |
| V _{OH} | Output Voltage (on) | R _L = 1.0KΩ | 4.9 | -- | -- | Volts |
| | | DTC114EE V _{CC} =5.0V, V _B =0.5V | | | | |
| | | DTC124EE V _{CC} =5.0V, V _B =0.5V | | | | |
| | | DTC144EE V _{CC} =5.0V, V _B =0.5V | | | | |
| | | DTC114YE V _{CC} =5.0V, V _B =0.5V | | | | |
| | | DTC114TE V _{CC} =5.0V, V _B =0.25V | | | | |
| | | DTC143TE V _{CC} =5.0V, V _B =0.25V | | | | |
| | | DTC123EE V _{CC} =5.0V, V _B =0.5V | | | | |
| | | DTC143EE V _{CC} =5.0V, V _B =0.5V | | | | |
| | | DTC143ZE V _{CC} =5.0V, V _B =0.25V | | | | |
| | | DTC124XE V _{CC} =5.0V, V _B =0.5V | | | | |
| | | DTC123JE V _{CC} =5.0V, V _B =0.5V | | | | |

Electrical Characteristics (T_A = 25°C unless otherwise noted)

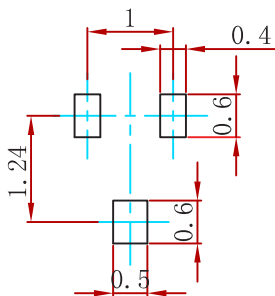
| Symbol | Characteristic | Min | Typ | Max | Unit | |
|--------|----------------|--------------|-------|-------|-------|----|
| R1 | Input Resistor | DTC114EE--MS | 7.0 | 10 | 13 | KΩ |
| | | DTC124EE-MS | 15.4 | 22 | 28.6 | |
| | | DTC144EE-MS | 32.9 | 47 | 61.1 | |
| | | DTC114YE-MS | 7.0 | 10 | 13 | |
| | | DTC114TE-MS | 7.0 | 10 | 13 | |
| | | DTC143TE-MS | 3.3 | 4.7 | 6.1 | |
| | | DTC123EE-MS | 1.5 | 2.2 | 2.9 | |
| | | DTC143EE-MS | 3.3 | 4.7 | 6.1 | |
| | | DTC143ZE-MS | 3.3 | 4.7 | 6.1 | |
| | | DTC124XE-MS | 15.4 | 22 | 28.6 | |
| | | DTC123JE-MS | 1.54 | 2.2 | 2.86 | |
| R1/R2 | Resistor Ratio | DTC114EE-MS | 0.8 | 1.0 | 1.2 | -- |
| | | DTC124EE-MS | 0.8 | 1.0 | 1.2 | |
| | | DTC144EE-MS | 0.8 | 1.0 | 1.2 | |
| | | DTC114YE-MS | 0.17 | 0.21 | 0.25 | |
| | | DTC114TE-MS | - | - | - | |
| | | DTC143TE-MS | - | - | - | |
| | | DTC123EE-MS | 0.8 | 1.0 | 1.2 | |
| | | DTC143EE-MS | 0.8 | 1.0 | 1.2 | |
| | | DTC143ZE-MS | 0.055 | 0.1 | 0.185 | |
| | | DTC124XE-MS | 0.38 | 0.47 | 0.56 | |
| | | DTC123JE-MS | 0.038 | 0.047 | 0.056 | |

PACKAGE MECHANICAL DATA



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min. | Max. | Min. | Max. |
| A | 0.700 | 0.900 | 0.028 | 0.035 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 0.700 | 0.800 | 0.028 | 0.031 |
| b1 | 0.150 | 0.250 | 0.006 | 0.010 |
| b2 | 0.250 | 0.350 | 0.010 | 0.014 |
| c | 0.100 | 0.200 | 0.004 | 0.008 |
| D | 1.500 | 1.700 | 0.059 | 0.067 |
| E | 0.700 | 0.900 | 0.028 | 0.035 |
| E1 | 1.450 | 1.750 | 0.057 | 0.069 |
| e | 0.500 TYP. | | 0.020 TYP. | |
| e1 | 0.900 | 1.100 | 0.035 | 0.043 |
| L | 0.400 REF. | | 0.016 REF. | |
| L1 | 0.260 | 0.460 | 0.010 | 0.018 |
| θ | 0° | 8° | 0° | 8° |

Suggested Pad Layout



- Note:
1. Controlling dimension: in millimeters.
 2. General tolerance: ±0.05mm.
 3. The pad layout is for reference purposes only.

REEL SPECIFICATION

| P/N | PKG | QTY |
|-------------|---------|------|
| DTCXXXXX-MS | SOT-523 | 3000 |

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