

Type 2N5154L

Geometry 9201

Polarity NPN

Qual Level: JAN - JANS

**Generic Part Number:
2N5154L**

REF: MIL-PRF-19500/544

Features:

- Silicon power transistor for use in high speed switching applications.
- Housed in a TO-5 case.
- Also available in chip form using the 9201 chip geometry.
- The Min and Max limits shown are per MIL-PRF-19500/544 which Semicoa meets in all cases.

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TO-5

Maximum Ratings

$T_C = 25^{\circ}\text{C}$ unless otherwise specified

| Rating | Symbol | Rating | Unit |
|--|-----------|-------------|--------------------------------|
| Collector-Emitter Voltage | V_{CEO} | 80 | V |
| Collector-Base Voltage | V_{CBO} | 100 | V |
| Emitter-Base Voltage | V_{EBO} | 5.5 | V |
| Collector Current, Continuous | I_C | 2 | A |
| Collector Current, $P_W < 8.3$ ms, < 1% duty cycle | I_C | 10 | A |
| Reverse Pulse Energy | | 15 | mJ |
| Power Disipation $T_A = 25^{\circ}\text{C}$ ambient Derate above 25°C | P_T | 1.0 5.7 | Watt mW/ $^{\circ}\text{C}$ |
| Operating Junction Temperature | T_J | -65 to +200 | $^{\circ}\text{C}$ |
| Storage Temperature | T_{STG} | -65 to +200 | $^{\circ}\text{C}$ |

Electrical Characteristics

$T_C = 25^\circ\text{C}$ unless otherwise specified

| OFF Characteristics | Symbol | Min | Max | Unit |
|---|---------------|-----|-----|---------------|
| Collector-Base Breakdown Voltage $I_C = 100\text{ mA}, I_B = 0, \text{pulsed}$ | $V_{(BR)CBO}$ | 80 | --- | V |
| Base-Emitter Cutoff Current $V_{EB} = 4\text{ V}, I_C = 0$ | I_{EBO1} | --- | 1.0 | μA |
| $V_{EB} = 5.5\text{ V}, I_C = 0$ | I_{EBO2} | --- | 1.0 | mA |
| Collector-Emitter Cutoff Current $V_{CE} = 60\text{ V}, V_{BE} = 0$ | I_{CES1} | --- | 1.0 | μA |
| $V_{CE} = 100\text{ V}, V_{BE} = 0$ | I_{CES2} | --- | 1.0 | mA |
| $V_{CE} = 40\text{ V}, I_B = 0$ | I_{CEO} | --- | 50 | μA |
| $V_{CE} = 60\text{ V}, V_{BE} = -2\text{ V}, T_C = 150^\circ\text{C}$ | I_{CEX} | --- | 500 | μA |

| ON Characteristics | Symbol | Min | Max | Unit |
|---|----------------|-----|------|------|
| Forward Current Transfer Ratio $I_C = 50\text{ mA}, V_{CE} = 5\text{ V}$ | h_{FE1} | 50 | --- | --- |
| $I_C = 2.5\text{ A}, V_{CE} = 5\text{ V}, \text{pulsed}$ | h_{FE2} | 70 | 200 | --- |
| $I_C = 5.0\text{ A}, V_{CE} = 5\text{ V}, \text{pulsed}$ | h_{FE3} | 40 | --- | --- |
| $I_C = 2.55\text{ A}, V_{CE} = 5\text{ V}, \text{pulsed}, T_C = -55^\circ\text{C}$ | h_{FE4} | 25 | --- | --- |
| Base-Emitter Voltage, Nonsaturated $V_{CE} = 5\text{ V}, I_C = 2.5\text{ A}, \text{pulsed}$ | V_{BE} | --- | 1.45 | V dc |
| Base-Emitter Saturation Voltage $I_C = 2.5\text{ A}, I_B = 250\text{ mA}, \text{pulsed}$ | $V_{BE(sat)1}$ | --- | 1.45 | V dc |
| $I_C = 5\text{ A}, I_B = 500\text{ mA}, \text{pulsed}$ | $V_{BE(sat)2}$ | --- | 2.2 | V dc |
| Collector-Emitter Saturation Voltage $I_C = 2.5\text{ A}, I_B = 250\text{ mA}, \text{pulsed}$ | $V_{CE(sat)1}$ | --- | 0.75 | V dc |
| $I_C = 5\text{ A}, I_B = 500\text{ mA}, \text{pulsed}$ | $V_{CE(sat)2}$ | --- | 1.5 | V dc |

| Small Signal Characteristics | Symbol | Min | Max | Unit |
|---|------------|-----|-----|------|
| <i>Magnitude of Common Emitter Small Signal Short Circuit Forward Current Transfer Ratio</i> $V_{CE} = 5\text{ V}, I_C = 500\text{ mA}, f = 10\text{ MHz}$ | $ h_{fe} $ | 7.0 | --- | --- |
| <i>Common Emitter, Small Signal Short Circuit Forward Current Transfer Ratio</i> $V_{CE} = 5\text{ V}, I_C = 100\text{ mA}, f = 1\text{ kHz}$ | h_{fe} | 50 | --- | --- |
| <i>Open Circuit Output Capacitance</i> $V_{CB} = 10\text{ V}, I_E = 0, f = 1\text{ MHz}$ | C_{OBO} | --- | 250 | pF |

| Switching Time | Symbol | Min | Max | Unit |
|---|-----------|-----|-----|---------------|
| <i>Delay Time</i> $I_C = 5\text{ A}, I_{B1} = 500\text{ mA}$ | t_{ON} | --- | 0.5 | μs |
| <i>Storage Time</i> $I_{B2} = -500\text{ mA}$ | t_s | --- | 1.4 | μs |
| <i>Fall Time</i> $V_{BE(off)} = 3.7\text{ V}$ | t_f | --- | 0.5 | μs |
| <i>Turn-Off Time</i> $R_L = 6\text{ ohms}$ | t_{OFF} | --- | 1.5 | μs |