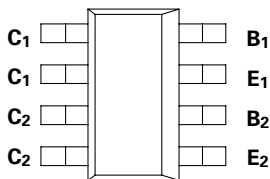


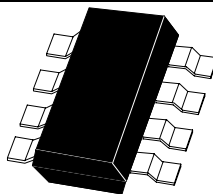
SM-8 DUAL NPN MEDIUM POWER HIGH GAIN TRANSISTORS

ISSUE 1 – JANUARY 1996

ZDT1049



PARTMARKING DETAIL – T1049



SM-8
(8 LEAD SOT223)

ABSOLUTE MAXIMUM RATINGS.

| PARAMETER | SYMBOL | VALUE | UNIT |
|-----------------------------------------|----------------|-------------|------|
| Collector-Base Voltage | V_{CBO} | 80 | V |
| Collector-Emitter Voltage | V_{CEO} | 25 | V |
| Emitter-Base Voltage | V_{EBO} | 5 | V |
| Peak Pulse Current | I_{CM} | 20 | A |
| Continuous Collector Current | I_C | 5 | A |
| Base Current | I_B | 500 | mA |
| Operating and Storage Temperature Range | $T_j; T_{stg}$ | -55 to +150 | °C |

THERMAL CHARACTERISTICS

| PARAMETER | SYMBOL | VALUE | UNIT |
|-----------------------------------------------------------------------------------------------------------|-----------|--------------|----------------|
| Total Power Dissipation at $T_{amb} = 25^\circ\text{C}^*$ Any single die "on" Both die "on" equally | P_{tot} | 2.25 2.75 | W W |
| Derate above 25°C^* Any single die "on" Both die "on" equally | | 18 22 | mW/°C mW/°C |
| Thermal Resistance - Junction to Ambient* Any single die "on" Both die "on" equally | | 55.6 45.5 | °C/W °C/W |

* The power which can be dissipated assuming the device is mounted in a typical manner on a PCB with copper equal to 2 inches square.

ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated).

| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT | CONDITIONS. |
|---------------------------------------|---------------|--------------------------------|--------------------------------|------------------------|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Collector-Base Breakdown Voltage | $V_{(BR)CBO}$ | 80 | 120 | | V | $I_C=100\mu\text{A}$ |
| Collector-Emitter Breakdown Voltage | V_{CES} | 80 | 120 | | V | $I_C=100\mu\text{A}$ |
| Collector-Emitter Breakdown Voltage | V_{CEO} | 25 | 35 | | V | $I_C=10\text{mA}$ |
| Collector-Emitter Breakdown Voltage | V_{CEV} | 80 | 120 | | V | $I_C=100\mu\text{A}, V_{EB}=1\text{V}$ |
| Emitter-Base Breakdown Voltage | $V_{(BR)EBO}$ | 5 | 8.75 | | V | $I_E=100\mu\text{A}$ |
| Collector Cut-Off Current | I_{CBO} | | 0.3 | 10 | nA | $V_{CB}=50\text{V}$ |
| Emitter Cut-Off Current | I_{EBO} | | 0.3 | 10 | nA | $V_{EB}=4\text{V}$ |
| Collector Emitter Cut-Off Current | I_{CES} | | 0.3 | 10 | nA | $V_{CES}=50\text{V}$ |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | | 30 60 125 155 | 45 80 180 220 | mV mV mV mV | $I_C=0.5\text{A}, I_B=10\text{mA}^*$ $I_C=1\text{A}, I_B=10\text{mA}^*$ $I_C=2\text{A}, I_B=10\text{mA}^*$ $I_C=4\text{A}, I_B=50\text{mA}^*$ |
| Base-Emitter Saturation Voltage | $V_{BE(sat)}$ | | 890 | 950 | mV | $I_C=4\text{A}, I_B=50\text{mA}^*$ |
| Base-Emitter Turn-On Voltage | $V_{BE(on)}$ | | 820 | 900 | mV | $I_C=4\text{A}, V_{CE}=2\text{V}^*$ |
| Static Forward Current Transfer Ratio | h_{FE} | 250 300 300 200 35 | 430 450 450 350 70 | 1200 | | $I_C=10\text{mA}, V_{CE}=2\text{V}^*$ $I_C=0.5\text{A}, V_{CE}=2\text{V}^*$ $I_C=1\text{A}, V_{CE}=2\text{V}^*$ $I_C=4\text{A}, V_{CE}=2\text{V}^*$ $I_C=20\text{A}, V_{CE}=2\text{V}^*$ |
| Transition Frequency | f_T | | 180 | | MHz | $I_C=50\text{mA}, V_{CE}=10\text{V}$ $f=50\text{MHz}$ |
| Output Capacitance | C_{obo} | | 45 | 60 | pF | $V_{CB}=10\text{V}, f=1\text{MHz}$ |
| Turn - On Time | t_{on} | | 125 | | ns | $I_C=4\text{A}, I_B=40\text{mA}, V_{CC}=10\text{V}$ |
| Turn -Off Time | t_{off} | | 380 | | ns | $I_C=4\text{A}, I_B=\pm 40\text{mA}, V_{CC}=10\text{V}$ |

*Measured under pulsed conditions. Pulse width=300 μs . Duty cycle $\leq 2\%$

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TYPICAL CHARACTERISTICS

