

COMPLEMENTARY SILICON POWER TRANSISTORS

...designed for various specific and general purpose application such as; output and driver stages of amplifiers operating at frequencies from DC to greater than 1.0MHz series, shunt and switching regulators; low and high frequency inverters/converters and many others.

FEATURES:

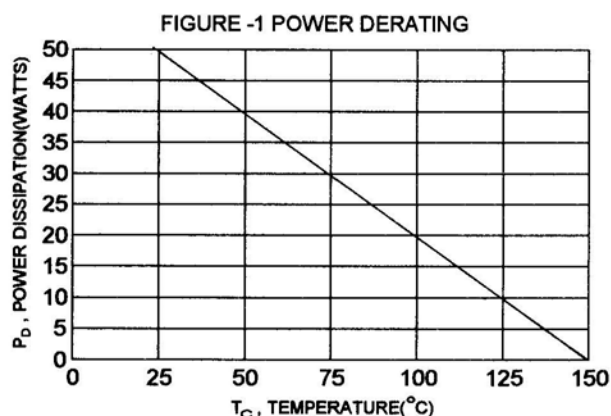
- * Very Low Collector Saturation Voltage
- * Excellent Linearity
- * Fast Switching
- * PNP Values are Negative, Observe Proper Polarity.

MAXIMUM RATINGS

| Characteristic | Symbol | D44VM1 D45VM1 | D44VM4 D45VM4 | D44VM7 D45VM7 | D44VM10 D45VM10 | Unit |
|--|-------------------|------------------|------------------|------------------|--------------------|--------------------------|
| Collector-Emitter Voltage | V_{CEO} | 30 | 45 | 60 | 80 | V |
| Collector-Emitter Voltage | V_{CEV} | 50 | 70 | 80 | 100 | V |
| Emitter-Base Voltage | V_{EBO} | 7.0 | | | | V |
| Collector Current - Continuous Peak | I_C I_{CM} | 8.0 16 | | | | A |
| Base Current | I_B | 1.5 | | | | A |
| Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C | P_D | 50 0.4 | | | | W W/ $^\circ\text{C}$ |
| Operating and Storage Junction Temperature Range | T_J, T_{STG} | -55 to +150 | | | | $^\circ\text{C}$ |

THERMAL CHARACTERISTICS

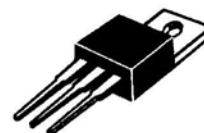
| Characteristic | Symbol | Max | Unit |
|-------------------------------------|-----------------|-----|--------------------|
| Thermal Resistance Junction to Case | $R_{\theta JC}$ | 2.5 | $^\circ\text{C/W}$ |



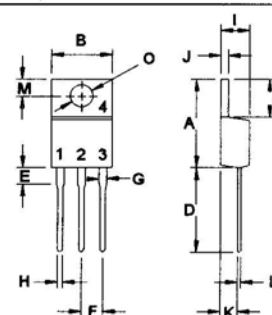
NPN
D44VM
Series

PNP
D45VM
Series

8 AMPERE
COMPLEMENTARY SILICON
POWER TRANSISTORS
30-80 VOLTS
50 WATTS



TO-220



PIN 1. BASE
2. COLLECTOR
3. EMITTER
4. COLLECTOR (CASE)

| DIM | MILLIMETERS | |
|-----|-------------|-------|
| | MIN | MAX |
| A | 14.68 | 16.00 |
| B | 9.78 | 10.42 |
| C | 5.02 | 6.60 |
| D | 13.00 | 14.62 |
| E | 3.10 | 4.19 |
| F | 2.41 | 2.67 |
| G | 1.10 | 1.67 |
| H | 0.69 | 1.01 |
| I | 3.21 | 4.98 |
| J | 1.14 | 1.40 |
| K | 2.20 | 3.30 |
| L | 0.28 | 0.61 |
| M | 2.48 | 3.00 |
| O | 3.50 | 4.00 |

ELECTRICAL CHARACTERISTICS ($T_c = 25^\circ\text{C}$ unless otherwise noted)

| Characteristic | Symbol | Min | Max | Unit |
|----------------|--------|-----|-----|------|
|----------------|--------|-----|-----|------|

OFF CHARACTERISTICS

| | | | | |
|---|-----------|--|-----------|---------------|
| Collector-Base Cutoff Current ($V_{CEV} = \text{Rated Value}$, $v_{BE(OFF)} = 4.0\text{ V}$) ($V_{CEV} = \text{Rated Value}$, $v_{BE(OFF)} = 4.0\text{ V}$, $T_c = 100^\circ\text{C}$) | I_{CEV} | | 10 100 | μA |
| Emitter-Base Cutoff Current ($V_{BE} = 7.0\text{ V}$, $I_C = 0$) | I_{EBO} | | 10 | μA |

ON CHARACTERISTICS(1)

| | | | | | |
|--|--|---------------|----------------------|-------------------|---|
| DC Current Gain ($I_C = 4.0\text{ A}$, $V_{CE} = 1.0\text{ V}$) ($I_C = 6.0\text{ A}$, $V_{CE} = 1.0\text{ V}$) ($I_C = 8.0\text{ A}$, $V_{CE} = 1.0\text{ V}$) | D44VM Series D45VM Series D44VM Series D45VM Series | h_{FE} | 40 20 20 10 | | |
| Collector-Emitter Saturation Voltage ($I_C = 4.0\text{ A}$, $I_B = 400\text{ mA}$) ($I_C = 8.0\text{ A}$, $I_B = 800\text{ mA}$) ($I_C = 8.0\text{ A}$, $I_B = 800\text{ mA}$, $T_c = 100^\circ\text{C}$) | | $V_{CE(sat)}$ | | 0.8 1.2 1.5 | V |
| Base-Emitter Saturation Voltage ($I_C = 8.0\text{ A}$, $I_B = 800\text{ mA}$) ($I_C = 8.0\text{ A}$, $I_B = 800\text{ mA}$, $T_c = 100^\circ\text{C}$) | | $V_{BE(sat)}$ | | 1.5 1.6 | V |

DYAMIC CHARATERISTICS

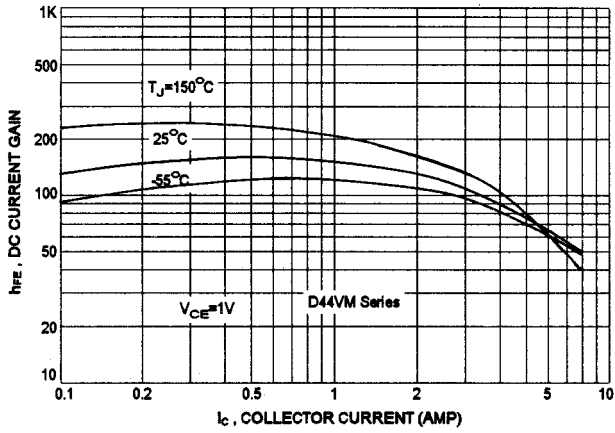
| | | | | |
|---|-------|---------|--|-----|
| Current-Gain Bandwidth Product (2) ($I_C = 100\text{ mA}$, $V_{CE} = 10\text{ V}$, $f = 1.0\text{ MHz}$) | f_T | 30(typ) | | MHz |
|---|-------|---------|--|-----|

SWITCHING CHARATERISTICS

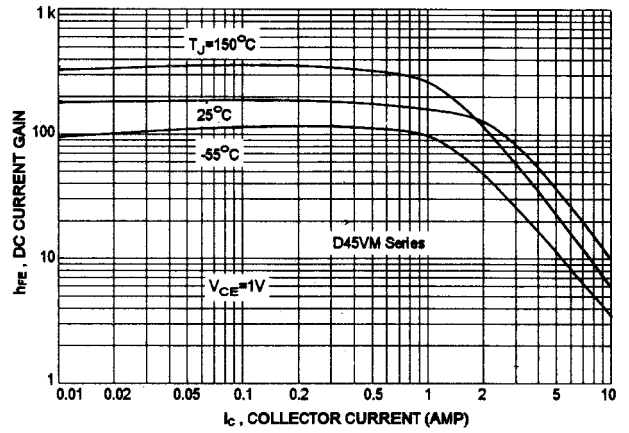
| | | | | | | |
|--------------|------------------------------------|------------------------------|-------|--|------------|---------------|
| Rise Time | $V_{CC} = 30\text{ V}$ | D44VM Series D45VM Series | t_r | | 0.5 0.6 | μs |
| Storage Time | $I_C = 8\text{ A}$, | D44VM Series D45VM Series | t_s | | 1.3 1.1 | μs |
| Fall Time | $I_{B1} = -I_{B2} = 800\text{ mA}$ | D44VM Series D45VM Series | t_f | | 0.4 0.5 | μs |

(1) Pulse Test: Pulse width = $300\text{ }\mu\text{s}$, Duty Cycle $\leq 2.0\%$ (2) $f_T = |h_{fe}| \cdot f_{test}$

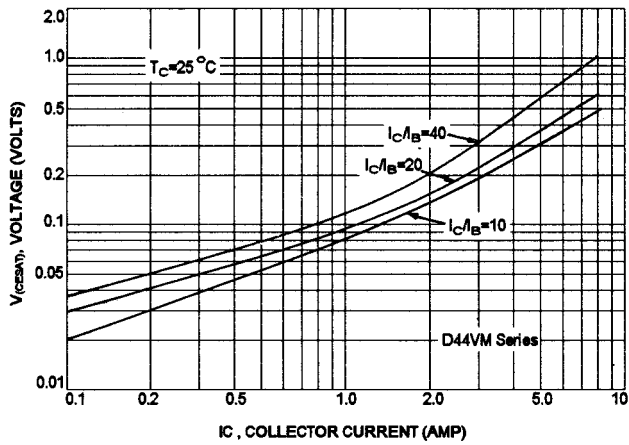
DC CURRENT GAIN



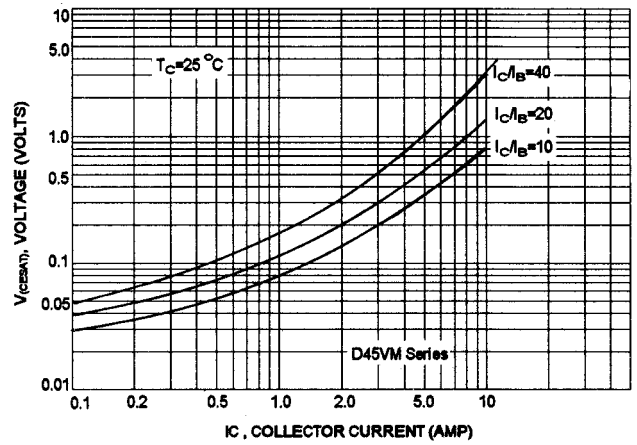
DC CURRENT GAIN



COLLECTOR-EMITTER SATURATION VOLTAGE

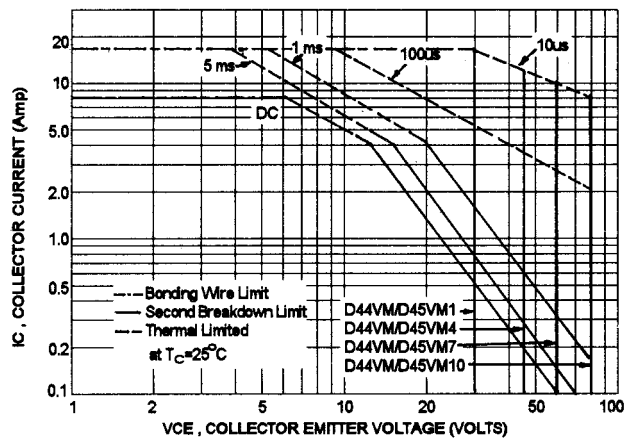


COLLECTOR-EMITTER SATURATION VOLTAGE



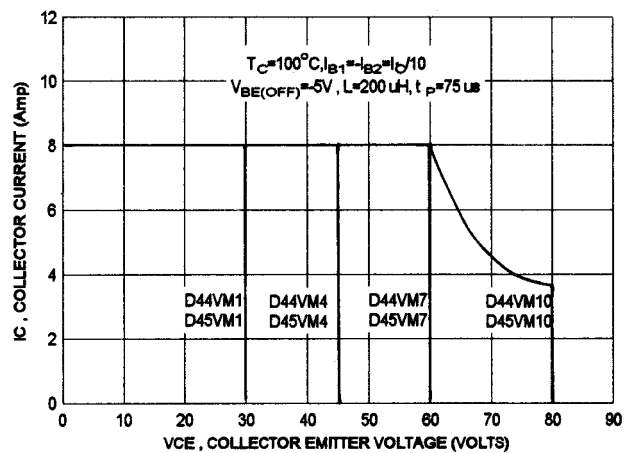
D44VM/D45VM

FORWARD-BIAS SAFE OPERATING AREA



D44VM/D45VM

REVERSE-BIAS SAFE OPERATING AREA



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