

CentralTM Semiconductor Corp.

145 Adams Ave., Hauppauge, NY 11788 USA
Phone (631) 435-1110 FAX (631) 435-1824

Manufacturers of World Class Discrete Semiconductors

www.centrasemi.com

MJE13004
MJE13005

NPN SILICON
POWER TRANSISTOR

JEDEC TO-220 CASE

DESCRIPTION

The CENTRAL SEMICONDUCTOR MJE13004 and MJE13005 are Silicon NPN Power Transistors, designed for high speed power switching applications.

MAXIMUM RATINGS (T_C=25°C unless otherwise noted)

| | SYMBOL | MJE13004 | MJE13005 | UNITS |
|---|-----------------------------------|----------|-------------|-------|
| Collector-Emitter Voltage | V _{CEO} | 300 | 400 | V |
| Collector-Emitter Voltage | V _{CEV} | 600 | 700 | V |
| Emitter-Base Voltage | V _{EBO} | | 9.0 | V |
| Collector Current | I _C | | 4.0 | A |
| Peak Collector Current | I _{CM} | | 8.0 | A |
| Base Current | I _B | | 2.0 | A |
| Peak Base Current | I _{BM} | | 4.0 | A |
| Power Dissipation (T _A =25°C) | P _D | | 2.0 | W |
| Power Dissipation | P _D | | 75 | W |
| Operating and Storage Junction Temperature | T _J , T _{stg} | | -65 to +150 | °C |
| Thermal Resistance | θ _{JA} | | 62.5 | °C/W |
| Thermal Resistance | θ _{JC} | | 1.67 | °C/W |

ELECTRICAL CHARACTERISTICS (T_C=25°C unless otherwise noted)

| SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNITS |
|----------------------|---|-----|-----|-----|-------|
| I _{CEV} | V _{CE} =600V, V _{BE(OFF)} =1.5V (MJE13004) | | | 1.0 | mA |
| I _{CEV} | V _{CE} =600V, V _{BE(OFF)} =1.5V, T _C =100°C (MJE13004) | | | 5.0 | mA |
| I _{CEV} | V _{CE} =700V, V _{BE(OFF)} =1.5V (MJE13005) | | | 1.0 | mA |
| I _{CEV} | V _{CE} =700V, V _{BE(OFF)} =1.5V, T _C =100°C (MJE13005) | | | 5.0 | mA |
| I _{EBO} | V _{EB} =9.0V | | | 1.0 | mA |
| BV _{CEO} | I _C =10mA (MJE13004) | 300 | | | V |
| BV _{CEO} | I _C =10mA (MJE13005) | 400 | | | V |
| V _{CE(SAT)} | I _C =1.0A, I _B =0.2A | | | 0.5 | V |
| V _{CE(SAT)} | I _C =2.0A, I _B =0.5A | | | 0.6 | V |
| V _{CE(SAT)} | I _C =4.0A, I _B =1.0A | | | 1.0 | V |
| V _{CE(SAT)} | I _C =2.0A, I _B =0.5A, T _C =100°C | | | 1.0 | V |
| V _{BE(SAT)} | I _C =1.0A, I _B =0.2A | | | 1.2 | V |
| V _{BE(SAT)} | I _C =2.0A, I _B =0.5A | | | 1.6 | V |
| V _{BE(SAT)} | I _C =2.0A, I _B =0.5A, T _C =100°C | | | 1.5 | V |
| h _{FE} | V _{CE} =5.0V, I _C =1.0A | 10 | | 60 | |
| h _{FE} | V _{CE} =5.0V, I _C =2.0A | 8.0 | | 40 | |

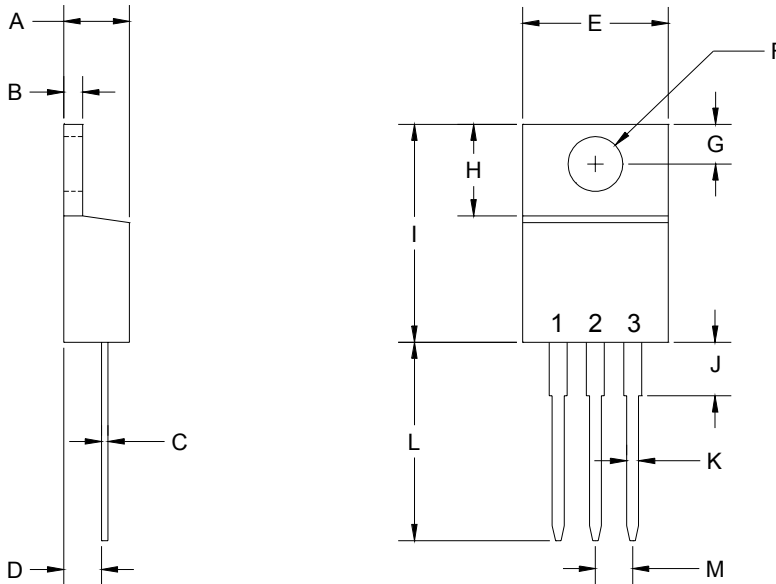
(SEE REVERSE SIDE)

R0

ELECTRICAL CHARACTERISTICS (CONTINUED)

| <u>SYMBOL</u> | <u>TEST CONDITIONS</u> | <u>MIN</u> | <u>TYP</u> | <u>MAX</u> | <u>UNITS</u> |
|---------------|---|------------|------------|------------|--------------|
| f_T | $V_{CE}=10V, I_C=500mA, f=1.0MHz$ | 4.0 | | | MHz |
| C_{ob} | $V_{CB}=10V, I_E=0, f=1.0kHz$ | | 65 | | pF |
| t_d | $V_{CC}=125V, I_C=2.0A, I_{B1}=I_{B2}=0.4A$ | | | 0.1 | μs |
| t_r | $t_p=25\mu s, \text{Duty Cycle} \leq 1.0\%$ | | | 0.7 | μs |
| t_s | | | | 4.0 | μs |
| t_f | | | | 0.9 | μs |
| t_{sv} | $I_C=2.0A, V_{clamp}=300V, I_{B1}=0.4A,$ | | | 4.0 | μs |
| t_c | $V_{BE(off)}=5.0V, T_C=100^\circ C$ | | | 0.9 | μs |
| t_{fi} | | | 0.15 | | μs |

TO-220 PACKAGE - MECHANICAL OUTLINE



| SYMBOL | DIMENSIONS | | | |
|---------|------------|-------|-------------|-------|
| | INCHES | | MILLIMETERS | |
| | MIN | MAX | MIN | MAX |
| A | 0.176 | 0.190 | 4.48 | 4.82 |
| B | 0.045 | 0.055 | 1.15 | 1.39 |
| C | 0.014 | 0.026 | 0.35 | 0.65 |
| D | 0.083 | 0.106 | 2.10 | 2.70 |
| E | 0.394 | 0.417 | 10.01 | 10.60 |
| F (DIA) | 0.140 | 0.157 | 3.55 | 4.00 |
| G | 0.100 | 0.118 | 2.54 | 3.00 |
| H | 0.230 | 0.270 | 5.85 | 6.85 |
| I | 0.560 | 0.625 | 14.23 | 15.87 |
| J | - | 0.250 | - | 6.35 |
| K | 0.025 | 0.038 | 0.64 | 0.96 |
| L | 0.500 | 0.579 | 12.70 | 14.70 |
| M | 0.090 | 0.110 | 2.29 | 2.79 |

TO-220 (REV: R1)

Lead Code:

R1

- 1) Base
- 2) Collector
- 3) Emitter

Tab is Common to Pin 2

CentralTM
Semiconductor Corp.

145 Adams Ave., Hauppauge, NY 11788 USA
Phone (631) 435-1110 FAX (631) 435-1824

Manufacturers of World Class Discrete Semiconductors
www.centrasemi.com