

CMLM0605
MULTI DISCRETE MODULE™
SURFACE MOUNT
LOW $V_{CE(SAT)}$ SILICON PNP TRANSISTOR
AND
LOW V_F SILICON SCHOTTKY DIODE



Central™

Semiconductor Corp.

DESCRIPTION:

The Central Semiconductor CMLM0605 is a single PNP Transistor and Schottky Diode packaged in a space saving SOT-563 case is designed for small signal general purpose applications where size and operational efficiency are prime requirements.

- Complementary Device: **CMLM0405**
- Combination Low $V_{CE(SAT)}$ Transistor and Low V_F Schottky Diode.

MARKING CODES: C65

MAXIMUM RATINGS (SOT-563 Package): ($T_A=25^\circ\text{C}$)

Power Dissipation
Operating and Storage
Junction Temperature
Thermal Resistance

| SYMBOL | | UNITS |
|----------------|-------------|--------------------|
| P_D | 350 | mW |
| T_J, T_{stg} | -65 to +150 | $^\circ\text{C}$ |
| θ_{JA} | 357 | $^\circ\text{C/W}$ |

MAXIMUM RATINGS Q1: ($T_A=25^\circ\text{C}$)

Collector-Base Voltage
Collector-Emitter Voltage
Emitter-Base Voltage
Collector Current

| SYMBOL | | UNITS |
|-----------|-----|-------|
| V_{CBO} | 60 | V |
| V_{CEO} | 40 | V |
| V_{EBO} | 6.0 | V |
| I_C | 200 | mA |

MAXIMUM RATINGS D1: ($T_A=25^\circ\text{C}$)

Peak Repetitive Reverse Voltage
Continuous Forward Current
Peak Repetitive Forward Current, $t_p \leq 1\text{ms}$
Forward Surge Current, $t_p=8\text{ms}$

| SYMBOL | | UNITS |
|-----------|-----|-------|
| V_{RRM} | 40 | V |
| I_F | 500 | mA |
| I_{FRM} | 3.5 | A |
| I_{FSM} | 10 | A |

ELECTRICAL CHARACTERISTICS Q1: ($T_A=25^\circ\text{C}$ unless otherwise noted)

| SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNITS |
|---------------|--|------|-------|-------|------------------|
| I_{CEV} | $V_{CE}=30\text{V}, V_{EB}=3.0\text{V}$ | - | - | 50 | nA |
| BV_{CBO} | $I_C=10\mu\text{A}$ | 60 | 96 | - | V |
| BV_{CEO} | $I_C=1.0\text{mA}$ | 40 | 63 | - | V |
| BV_{EBO} | $I_E=10\mu\text{A}$ | 6.0 | 8.0 | - | V |
| $V_{CE(SAT)}$ | $I_C=10\text{mA}, I_B=1.0\text{mA}$ | - | 0.050 | 0.100 | V |
| $V_{CE(SAT)}$ | $I_C=50\text{mA}, I_B=5.0\text{mA}$ | - | 0.100 | 0.200 | V |
| $V_{BE(SAT)}$ | $I_C=10\text{mA}, I_B=1.0\text{mA}$ | 0.65 | 0.75 | 0.85 | V |
| $V_{BE(SAT)}$ | $I_C=50\text{mA}, I_B=5.0\text{mA}$ | - | 0.85 | 0.95 | V |
| h_{FE} | $V_{CE}=1.0\text{V}, I_C=0.1\text{mA}$ | 90 | 130 | - | |
| h_{FE} | $V_{CE}=1.0\text{V}, I_C=1.0\text{mA}$ | 100 | 140 | - | |
| h_{FE} | $V_{CE}=1.0\text{V}, I_C=10\text{mA}$ | 100 | 150 | 300 | |
| h_{FE} | $V_{CE}=1.0\text{V}, I_C=50\text{mA}$ | 70 | 130 | - | |
| h_{FE} | $V_{CE}=1.0\text{V}, I_C=100\text{mA}$ | 30 | 90 | - | |
| f_T | $V_{CE}=20\text{V}, I_C=10\text{mA}, f=100\text{MHz}$ | 300 | - | - | MHz |
| C_{ob} | $V_{CB}=5.0\text{V}, I_E=0, f=1.0\text{MHz}$ | - | - | 4.0 | pF |
| C_{ib} | $V_{BE}=0.5\text{V}, I_C=0, f=1.0\text{MHz}$ | - | - | 8.0 | pF |
| h_{ie} | $V_{CE}=10\text{V}, I_C=1.0\text{mA}, f=1.0\text{kHz}$ | - | - | 12 | $\text{k}\Omega$ |
| h_{re} | $V_{CE}=10\text{V}, I_C=1.0\text{mA}, f=1.0\text{kHz}$ | - | - | 10 | $\times 10^{-4}$ |

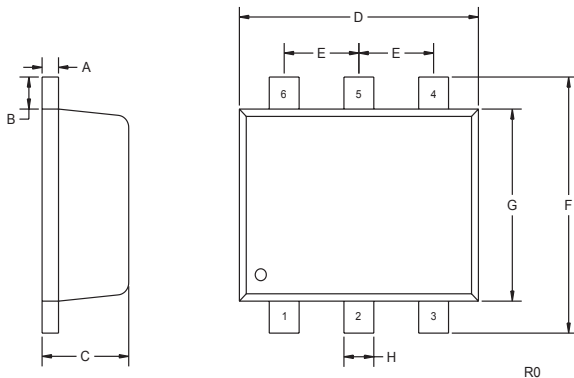
ELECTRICAL CHARACTERISTICS Q1 (continued)

| SYMBOL | TEST CONDITIONS | MIN | MAX | UNITS |
|----------|---|-----|-----|------------|
| h_{fe} | $V_{CE}=10V, I_C=1.0mA, f=1.0kHz$ | 100 | 400 | |
| h_{oe} | $V_{CE}=10V, I_C=1.0mA, f=1.0kHz$ | 1.0 | 60 | $\mu mhos$ |
| NF | $V_{CE}=5.0V, I_C=100\mu A, R_S=1.0K\Omega,$ $f=10Hz$ to 15.7kHz | | 4.0 | dB |
| t_d | $V_{CC}=3.0V, V_{BE}=0.5V, I_C=10mA, I_{B1}=1.0mA$ | | 35 | ns |
| t_r | $V_{CC}=3.0V, V_{BE}=0.5V, I_C=10mA, I_{B1}=1.0mA$ | | 35 | ns |
| t_s | $V_{CC}=3.0V, I_C=10mA, I_{B1}=I_{B2}=1.0mA$ | | 200 | ns |
| t_f | $V_{CC}=3.0V, I_C=10mA, I_{B1}=I_{B2}=1.0mA$ | | 50 | ns |

ELECTRICAL CHARACTERISTICS D1 ($T_A=25^\circ C$)

| | | | | |
|--------|----------------------|----|------|---------|
| I_R | $V_R=10V$ | | 20 | μA |
| I_R | $V_R=30V$ | | 100 | μA |
| BV_R | $I_R=500\mu A$ | 40 | | V |
| V_F | $I_F=100\mu A$ | | 0.13 | V |
| V_F | $I_F=1.0mA$ | | 0.21 | V |
| V_F | $I_F=10mA$ | | 0.27 | V |
| V_F | $I_F=100mA$ | | 0.35 | V |
| V_F | $I_F=500mA$ | | 0.47 | V |
| C_T | $V_R=1.0V, f=1.0MHz$ | | 50 | pF |

SOT-563 - MECHANICAL OUTLINE



| SYMBOL | DIMENSIONS | | | |
|--------|------------|-------|-------------|------|
| | INCHES | | MILLIMETERS | |
| | MIN | MAX | MIN | MAX |
| A | 0.004 | 0.007 | 0.10 | 0.18 |
| B | 0.008 | | 0.20 | |
| C | 0.022 | 0.024 | 0.56 | 0.60 |
| D | 0.059 | 0.067 | 1.50 | 1.70 |
| E | 0.020 | | 0.50 | |
| F | 0.061 | 0.067 | 1.55 | 1.70 |
| G | 0.047 | | 1.20 | |
| H | 0.006 | 0.012 | 0.15 | 0.30 |

SOT-563 (REV: R0)

MARKING CODE: C65

LEAD CODE:

- 1) EMITTER Q1
- 2) BASE Q1
- 3) CATHODE D1
- 4) ANODE D1
- 5) ANODE D1
- 6) COLLECTOR Q1

R1 (22-February 2005)