



**CMLM2205**

**MULTI DISCRETE MODULE™**

**SURFACE MOUNT  
SILICON SWITCHING NPN TRANSISTOR  
AND  
LOW V<sub>F</sub> SILICON SCHOTTKY DIODE**



**PICOmini™**



**SOT-563 CASE**

# Central™ Semiconductor Corp.

**DESCRIPTION:**

The Central Semiconductor CMLM2205 is a Multi Discrete Module™ consisting of a single NPN Transistor and Schottky Diode packaged in a space saving PICOmini™ SOT-563 case. This device is designed for small signal general purpose applications where size and operational efficiency are prime requirements.

- Combination: Small Signal Switching NPN Transistor and Low V<sub>F</sub> Schottky Diode.
- Complementary Device: **CMLM0705**

**Marking code: C22**

**MAXIMUM RATINGS (SOT-563 Package): (T<sub>A</sub>=25°C)**

Power Dissipation  
Operating and Storage Junction Temperature  
Thermal Resistance

SYMBOL		UNITS
P <sub>D</sub>	350	mW
T <sub>J</sub> , T <sub>stg</sub>	-65 to +150	°C
θ <sub>JA</sub>	357	°C/W

**MAXIMUM RATINGS Q1: (T<sub>A</sub>=25°C)**

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

SYMBOL		UNITS
V <sub>CB0</sub>	100	V
V <sub>CEO</sub>	45	V
V <sub>EBO</sub>	6.0	V
I <sub>C</sub>	600	mA

**MAXIMUM RATINGS D1: (T<sub>A</sub>=25°C)**

Peak Repetitive Reverse Voltage  
Continuous Forward Current  
Peak Repetitive Forward Current, tp ≤ 1ms  
Forward Surge Current, tp=8ms

SYMBOL		UNITS
V <sub>RRM</sub>	40	V
I <sub>F</sub>	500	mA
I <sub>FRM</sub>	3.5	A
I <sub>FSM</sub>	10	A

**ELECTRICAL CHARACTERISTICS Q1: (T<sub>A</sub>=25°C unless otherwise noted)**

SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNITS
I <sub>CB0</sub>	V <sub>CB</sub> =60V			10	nA
I <sub>CB0</sub>	V <sub>CB</sub> =60V, T <sub>A</sub> =125°C			10	µA
I <sub>CEV</sub>	V <sub>CE</sub> =60V, V <sub>EB</sub> =3.0V			10	nA
I <sub>EBO</sub>	V <sub>EB</sub> =3.0V			10	nA
BV <sub>CB0</sub>	I <sub>C</sub> =10µA	100	145		V
BV <sub>CEO</sub>	I <sub>C</sub> =10mA	45	53		V
BV <sub>EBO</sub>	I <sub>E</sub> =10µA	6.0			V
V <sub>CE(SAT)</sub>	I <sub>C</sub> =150mA, I <sub>B</sub> =15mA		0.09	0.15	V
V <sub>CE(SAT)</sub>	I <sub>C</sub> =500mA, I <sub>B</sub> =50mA		0.12	0.50	V
V <sub>BE(SAT)</sub>	I <sub>C</sub> =150mA, I <sub>B</sub> =15mA	0.6		1.2	V
V <sub>BE(SAT)</sub>	I <sub>C</sub> =500mA, I <sub>B</sub> =50mA			2.0	V
h <sub>FE</sub>	V <sub>CE</sub> =10V, I <sub>C</sub> =0.1mA	100	210		
h <sub>FE</sub>	V <sub>CE</sub> =10V, I <sub>C</sub> =1.0mA	100	205		
h <sub>FE</sub>	V <sub>CE</sub> =10V, I <sub>C</sub> =10mA	100	205		
h <sub>FE</sub>	V <sub>CE</sub> =1.0V, I <sub>C</sub> =150mA	75	150		
h <sub>FE</sub>	V <sub>CE</sub> =10V, I <sub>C</sub> =150mA	100		300	
h <sub>FE</sub>	V <sub>CE</sub> =10V, I <sub>C</sub> =500mA	60	130		

R1 (11-December 2007)

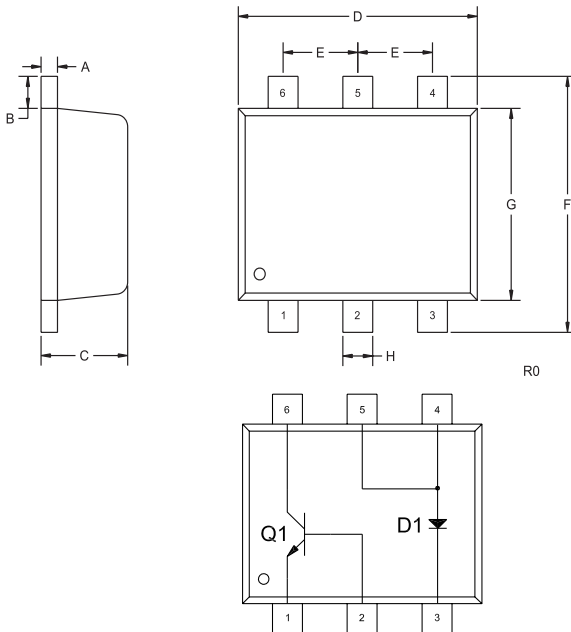
**ELECTRICAL CHARACTERISTICS Q1 - Continued: ( $T_A=25^\circ\text{C}$ )**

SYMBOL	TEST CONDITIONS	MIN	MAX	UNITS
$f_T$	$V_{CE}=20\text{V}$ , $I_C=20\text{mA}$ , $f=100\text{MHz}$	300		MHz
$C_{ob}$	$V_{CB}=10\text{V}$ , $I_E=0$ , $f=1.0\text{MHz}$		8.0	pF
$C_{ib}$	$V_{EB}=0.5\text{V}$ , $I_C=0$ , $f=1.0\text{MHz}$		25	pF
NF	$V_{CE}=10\text{V}$ , $I_C=100\text{mA}$ , $R_S=1.0\text{k}\Omega$ , $f=1.0\text{kHz}$		4.0	dB
$t_d$	$V_{CC}=30\text{V}$ , $V_{BE}=0.5$ , $I_C=150\text{mA}$ , $I_{B1}=15\text{mA}$		10	ns
$t_r$	$V_{CC}=30\text{V}$ , $V_{BE}=0.5$ , $I_C=150\text{mA}$ , $I_{B1}=15\text{mA}$		25	ns
$t_s$	$V_{CC}=30\text{V}$ , $I_C=150\text{mA}$ , $I_{B1}=I_{B2}=15\text{mA}$		225	ns
$t_f$	$V_{CC}=30\text{V}$ , $I_C=150\text{mA}$ , $I_{B1}=I_{B2}=15\text{mA}$		60	ns

**ELECTRICAL CHARACTERISTICS D1: ( $T_A=25^\circ\text{C}$ )**

$I_R$	$V_R=10\text{V}$		20	$\mu\text{A}$
$I_R$	$V_R=30\text{V}$		100	$\mu\text{A}$
$BV_R$	$I_R=500\mu\text{A}$	40		V
$V_F$	$I_F=100\mu\text{A}$		0.13	V
$V_F$	$I_F=1.0\text{mA}$		0.21	V
$V_F$	$I_F=10\text{mA}$		0.27	V
$V_F$	$I_F=100\text{mA}$		0.35	V
$V_F$	$I_F=500\text{mA}$		0.47	V
$C_T$	$V_R=1.0\text{V}$ , $f=1.0\text{ MHz}$		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)

**LEAD CODE:**

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

**MARKING CODE: C22**