

**CMLM2205**  
**MULTI DISCRETE MODULE™**  
 SURFACE MOUNT  
 SILICON SWITCHING NPN TRANSISTOR  
 AND  
 LOW  $V_F$  SILICON SCHOTTKY DIODE



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**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  $V_F$  Schottky Diode.
- Complementary Device: **CMLM0705**

**MARKING CODE: C22**

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

Power Dissipation  
 Operating and Storage Junction Temperature  
 Thermal Resistance

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

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

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

SYMBOL		UNITS
$V_{CBO}$	100	V
$V_{CEO}$	45	V
$V_{EBO}$	6.0	V
$I_C$	600	mA

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

Peak Repetitive Reverse Voltage  
 Continuous Forward Current  
 Peak Repetitive Forward Current,  $t_p \leq 1.0\text{ms}$   
 Peak Forward Surge Current,  $t_p = 8.0\text{ms}$

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
$I_{CBO}$	$V_{CB}=60\text{V}$			10	nA
$I_{CBO}$	$V_{CB}=60\text{V}, T_A=125^\circ\text{C}$			10	$\mu\text{A}$
$I_{CEV}$	$V_{CE}=60\text{V}, V_{EB}=3.0\text{V}$			10	nA
$I_{EBO}$	$V_{EB}=3.0\text{V}$			10	nA
$BV_{CBO}$	$I_C=10\mu\text{A}$	100	145		V
$BV_{CEO}$	$I_C=10\text{mA}$	45	53		V
$BV_{EBO}$	$I_E=10\mu\text{A}$	6.0			V
$V_{CE(SAT)}$	$I_C=150\text{mA}, I_B=15\text{mA}$		0.09	0.15	V
$V_{CE(SAT)}$	$I_C=500\text{mA}, I_B=50\text{mA}$		0.12	0.50	V
$V_{BE(SAT)}$	$I_C=150\text{mA}, I_B=15\text{mA}$	0.6		1.2	V
$V_{BE(SAT)}$	$I_C=500\text{mA}, I_B=50\text{mA}$			2.0	V
$h_{FE}$	$V_{CE}=10\text{V}, I_C=0.1\text{mA}$	100	210		
$h_{FE}$	$V_{CE}=10\text{V}, I_C=1.0\text{mA}$	100	205		
$h_{FE}$	$V_{CE}=10\text{V}, I_C=10\text{mA}$	100	205		
$h_{FE}$	$V_{CE}=1.0\text{V}, I_C=150\text{mA}$	75	150		
$h_{FE}$	$V_{CE}=10\text{V}, I_C=150\text{mA}$	100		300	
$h_{FE}$	$V_{CE}=10\text{V}, I_C=500\text{mA}$	60	130		

R2 (18-January 2010)

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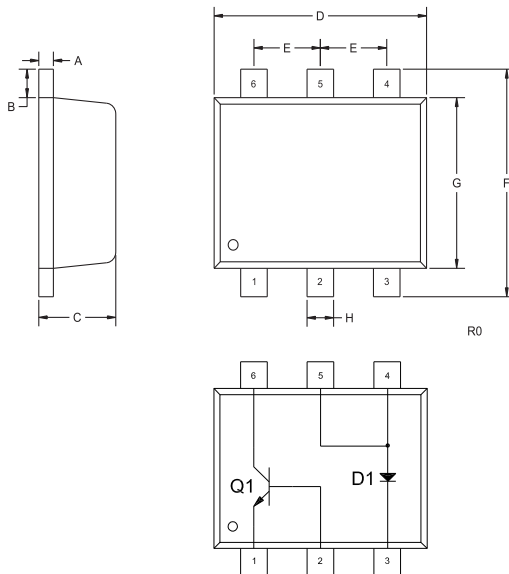
**ELECTRICAL CHARACTERISTICS - Q1 - Continued: ( $T_A=25^\circ\text{C}$ )**

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 CASE - 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

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