

CMLM0575
MULTI DISCRETE MODULE™
SURFACE MOUNT SILICON
N-CHANNEL MOSFET AND
LOW V_F SCHOTTKY DIODE



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DESCRIPTION:

The CENTRAL SEMICONDUCTOR CMLM0575 is a Multi Discrete Module™ consisting of a single N-Channel Enhancement-mode MOSFET and a Low V_F Schottky diode packaged in a space saving PICOmini™ SOT-563 surface mount case. This device is designed for small signal general purpose applications where size and operational efficiency are prime requirements.

MARKING CODE: 75C

FEATURES:

- High Current MOSFET (I_D=650mA)
- ESD protection up to 2kV
- Low r_{DS(ON)} MOSFET (275mΩ MAX @ V_{GS}=2.5V)
- Low V_F Schottky Diode (0.47V MAX @ 0.5A)

APPLICATIONS:

- DC - DC Converters
- Boost Converters
- Motor Drive Controls
- Battery Powered Portable Equipment

MAXIMUM RATINGS - CASE: (T_A=25°C)

Power Dissipation (Note 1)
 Power Dissipation (Note 2)
 Power Dissipation (Note 3)
 Operating and Storage Junction Temperature
 Thermal Resistance

MAXIMUM RATINGS - Q1: (T_A=25°C)

Drain-Source Voltage
 Gate-Source Voltage
 Continuous Drain Current

MAXIMUM RATINGS - D1: (T_A=25°C)

Peak Repetitive Reverse Voltage
 Continuous Forward Current
 Peak Repetitive Forward Current, tp≤1.0ms
 Peak Forward Surge Current, tp=8.0ms

SYMBOL

P _D	350	mW
P _D	300	mW
P _D	150	mW
T _J , T _{stg}	-65 to +150	°C
Θ _{JA}	357	°C/W

SYMBOL

V _{DS}	20	V
V _{GS}	8.0	V
I _D	650	mA

SYMBOL

V _{RRM}	40	V
I _F	500	mA
I _{FRM}	3.5	A
I _{FSM}	10	A

ELECTRICAL CHARACTERISTICS - Q1: (T_A=25°C unless otherwise noted)

SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNITS
I _{GSSF} , I _{GSSR}	V _{GS} =4.5V, V _{DS} =0			1.0	μA
I _{DSS}	V _{DS} =16V, V _{GS} =0			100	nA
BV _{DSS}	V _{GS} =0, I _D =250μA	20			V
V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	0.5		1.1	V
V _{SD}	V _{GS} =0, I _S =200mA			1.1	V
r _{DS(ON)}	V _{GS} =4.5V, I _D =600mA		0.14	0.23	Ω
r _{DS(ON)}	V _{GS} =2.5V, I _D =500mA		0.2	0.275	Ω
r _{DS(ON)}	V _{GS} =1.8V, I _D =350mA			0.7	Ω

- Notes: (1) Ceramic or aluminum core PC Board with copper mounting pad area of 4.0mm²
 (2) FR-4 Epoxy PC Board with copper mounting pad area of 4.0mm²
 (3) FR-4 Epoxy PC Board with copper mounting pad area of 1.4mm²

R1 (27-September 2011)

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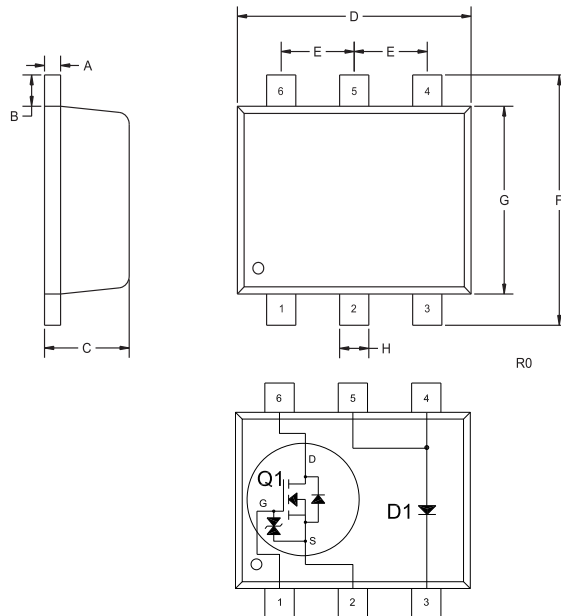
ELECTRICAL CHARACTERISTICS - Q1 Continued: ($T_A=25^\circ\text{C}$ unless otherwise noted)

SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNITS
$Q_{g(\text{tot})}$	$V_{DS}=10\text{V}$, $V_{GS}=4.5\text{V}$, $I_D=500\text{mA}$		1.58		nC
Q_{gs}	$V_{DS}=10\text{V}$, $V_{GS}=4.5\text{V}$, $I_D=500\text{mA}$		0.17		nC
Q_{gd}	$V_{DS}=10\text{V}$, $V_{GS}=4.5\text{V}$, $I_D=500\text{mA}$		0.24		nC
g_{FS}	$V_{DS}=10\text{V}$, $I_D=100\text{mA}$	200			mS
C_{rss}	$V_{DS}=16\text{V}$, $V_{GS}=0$, $f=1.0\text{MHz}$		18		pF
C_{iss}	$V_{DS}=16\text{V}$, $V_{GS}=0$, $f=1.0\text{MHz}$		100		pF
C_{oss}	$V_{DS}=16\text{V}$, $V_{GS}=0$, $f=1.0\text{MHz}$		16		pF
t_{on}	$V_{DD}=10\text{V}$, $V_{GS}=4.5\text{V}$, $I_D=200\text{mA}$, $R_G=10\Omega$		10		ns
t_{off}	$V_{DD}=10\text{V}$, $V_{GS}=4.5\text{V}$, $I_D=200\text{mA}$, $R_G=10\Omega$		25		ns

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

SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNITS
I_R	$V_R=10\text{V}$			20	μA
I_R	$V_R=30\text{V}$			100	μA
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) Gate Q1
- 2) Source Q1
- 3) Cathode D1
- 4) Anode D1
- 5) Anode D1
- 6) Drain Q1

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