

CMLM0575

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



MDM™
Multi Discrete Module

SOT-563 CASE



www.centrasemi.com

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 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 ($I_D=650\text{mA}$)
- ESD protection up to 2kV
- Low $r_{DS(ON)}$ MOSFET ($275\text{m}\Omega$ MAX @ $V_{GS}=2.5\text{V}$)
- 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: ($T_A=25^\circ\text{C}$)

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

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

Drain-Source Voltage
Gate-Source Voltage
Continuous Drain Current

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

SYMBOL		UNITS
P_D	350	mW
P_D	300	mW
P_D	150	mW
T_J, T_{stg}	-65 to +150	$^\circ\text{C}$
θ_{JA}	357	$^\circ\text{C/W}$

SYMBOL

SYMBOL		UNITS
V_{DS}	20	V
V_{GS}	8.0	V
I_D	650	mA

SYMBOL

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_{GSSF}, I_{GSSR}	$V_{GS}=4.5\text{V}, V_{DS}=0$			1.0	μA
I_{DSS}	$V_{DS}=16\text{V}, V_{GS}=0$			100	nA
BV_{DSS}	$V_{GS}=0, I_D=250\mu\text{A}$	20			V
$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	0.5		1.1	V
V_{SD}	$V_{GS}=0, I_S=200\text{mA}$			1.1	V
$r_{DS(ON)}$	$V_{GS}=4.5\text{V}, I_D=600\text{mA}$		0.14	0.23	Ω
$r_{DS(ON)}$	$V_{GS}=2.5\text{V}, I_D=500\text{mA}$		0.2	0.275	Ω
$r_{DS(ON)}$	$V_{GS}=1.8\text{V}, I_D=350\text{mA}$			0.7	Ω

Notes: (1) Ceramic or aluminum core PC Board with copper mounting pad area of 4.0mm^2

(2) FR-4 Epoxy PC Board with copper mounting pad area of 4.0mm^2

(3) FR-4 Epoxy PC Board with copper mounting pad area of 1.4mm^2

R4 (1-October 2015)

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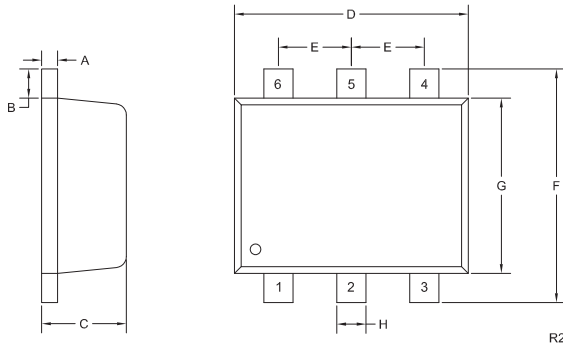
ELECTRICAL CHARACTERISTICS - Q1 Continued: (T_A=25°C unless otherwise noted)

SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNITS
Q _g (tot)	V _{DS} =10V, V _{GS} =4.5V, I _D =500mA		1.58		nC
Q _{gs}	V _{DS} =10V, V _{GS} =4.5V, I _D =500mA		0.17		nC
Q _{gd}	V _{DS} =10V, V _{GS} =4.5V, I _D =500mA		0.24		nC
g _{FS}	V _{DS} =10V, I _D =100mA	200			mS
C _{rss}	V _{DS} =16V, V _{GS} =0, f=1.0MHz		18		pF
C _{iss}	V _{DS} =16V, V _{GS} =0, f=1.0MHz		100		pF
C _{oss}	V _{DS} =16V, V _{GS} =0, f=1.0MHz		22		pF
t _{on}	V _{DD} =10V, V _{GS} =4.5V, I _D =200mA, R _G =10Ω		10		ns
t _{off}	V _{DD} =10V, V _{GS} =4.5V, I _D =200mA, R _G =10Ω		25		ns

ELECTRICAL CHARACTERISTICS - D1: (T_A=25°C)

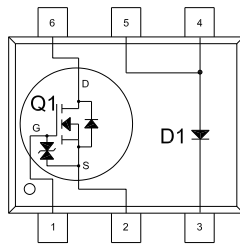
SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNITS
I _R	V _R =10V			20	μA
I _R	V _R =30V			100	μA
BV _R	I _R =500μA	40			V
V _F	I _F =100μA			0.13	V
V _F	I _F =1.0mA			0.21	V
V _F	I _F =10mA			0.27	V
V _F	I _F =100mA			0.35	V
V _F	I _F =500mA			0.47	V
C _J	V _R =1.0V, f=1.0MHz			50	pF

SOT-563 CASE - MECHANICAL OUTLINE



SYMBOL	DIMENSIONS			
	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.0027	0.007	0.07	0.18
B	0.008		0.20	
C	0.017	0.024	0.45	0.60
D	0.059	0.067	1.50	1.70
E	0.020		0.50	
F	0.059	0.067	1.50	1.70
G	0.043	0.051	1.10	1.30
H	0.006	0.012	0.15	0.30

SOT-563 (REV: R2)



LEAD CODE:

- 1) Gate Q1
- 2) Source Q1
- 3) Cathode D1
- 4) Anode D1
- 5) Anode D1
- 6) Drain Q1

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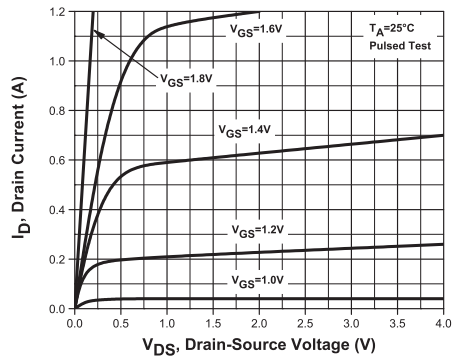
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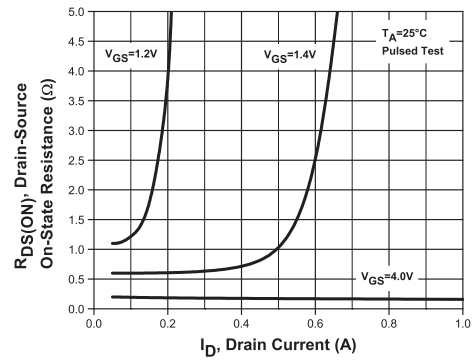


Q1 TYPICAL ELECTRICAL CHARACTERISTICS

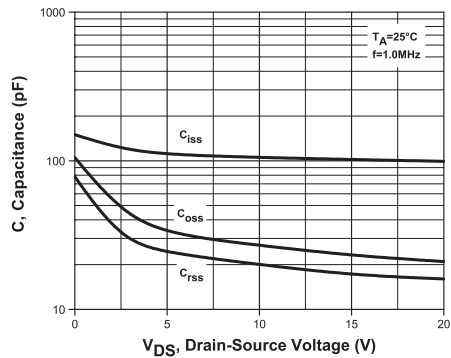
Output Characteristics



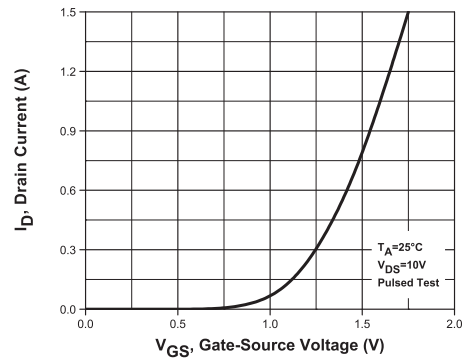
Drain Source On Resistance



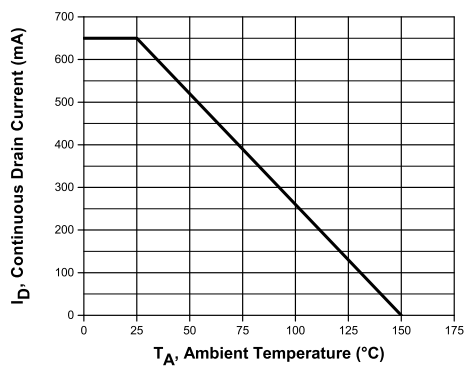
Capacitance



Transfer Characteristics



Current Derating



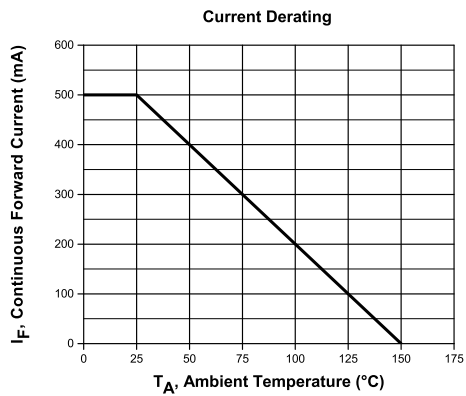
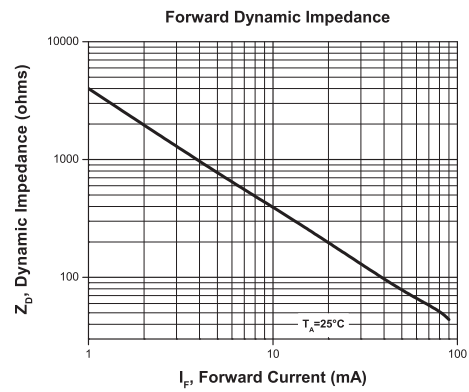
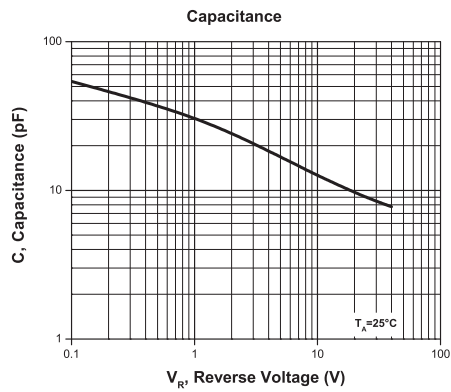
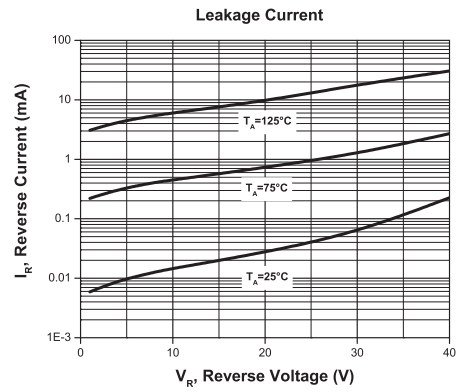
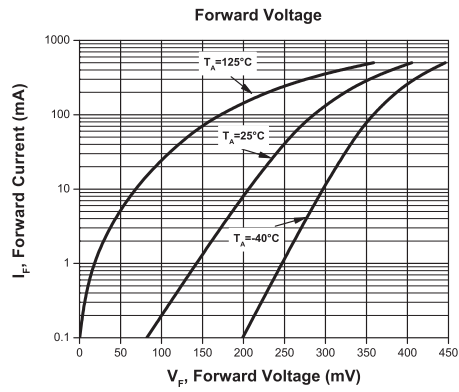
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D1 TYPICAL ELECTRICAL CHARACTERISTICS



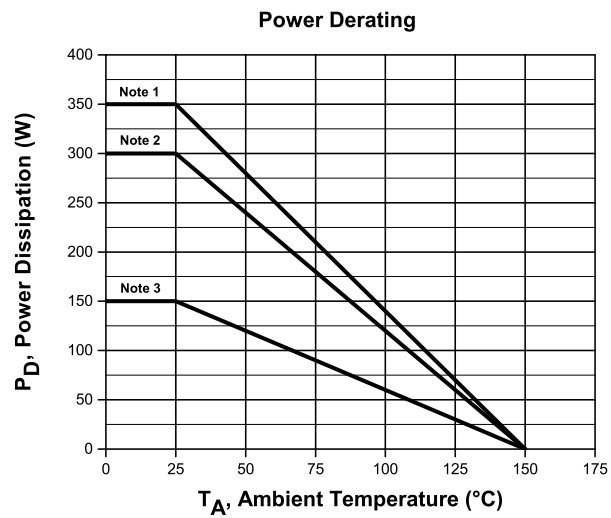
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TOTAL PACKAGE POWER DERATING



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(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

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- Application notes
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