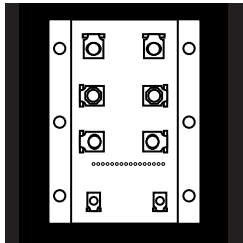


Preliminary Data Sheet

OMD150N06FL OMD60L60FL
OMD120N10FL OMD50F60FL

H-BRIDGE, MULTI-CHIP MODULES IN AN INDUSTRIAL ISOLATED PACKAGE



60 To 600 Volt, 50 To 150 Amp Modules With Internal Gate Drive, H-Bridge Configuration

FEATURES

- Internal Gate Drive
- Isolated Heat Sink
- Low Inductance Design
- Fast Switching Speed
- Low On Voltage
- Easy-To-Connect To Package

DESCRIPTION

These modules are ideally suited for high density, high reliability switching applications such as Motion Control, UPS and high power SMPS. These multi-chip modules incorporate in one package both the power semiconductors and the gate drive circuitry.

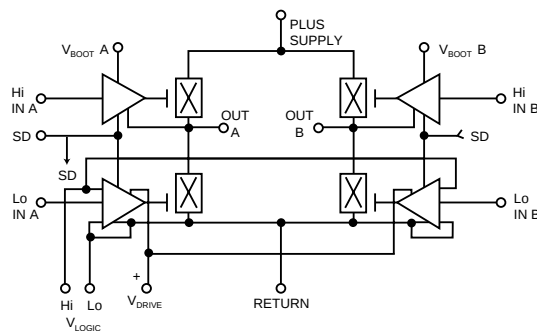
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GENERAL CHARACTERISTICS (Per Switch) @ 25°C

Part Number	Power Device	Voltage (V)*	Current (A)	$R_{DS(on)}$ or $V_{CE(sat)}$	Fall Time
OMD150N06FL	MOSFET	60	150	8 m ohms	-
OMD120N10FL	MOSFET	100	120	16 m ohms	-
OMD60L60FL	IGBT	600	75	1.8 Volts	1 μ s
OMD50F60FL	IGBT	600	75	2.7 Volts	500 ns

*Other voltages available.

SCHEMATIC



Note: IGBT's have anti-parallel diodes included.

OMD150N06FL OMD120N10FL OMD60L60FL OMD50F60FL

ELECTRICAL CHARACTERISTICS: OMD150N06FL/Per Switch ($T_C = 25^\circ\text{C}$ unless otherwise specified)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS					
Drain-Source Breakdown Voltage, $I_D = 500\ \mu\text{A}$, $V_{GS} = 0$	$V_{(BR)DSS}$	60	-	-	V
Zero Gate Voltage Drain Current = V_{GS} , $V_{DS} = \text{Max. Rat.}$	I_{DSS}	-	-	25	μA
$V_{DS} = \text{Max. Rat.} \times 0.8$, $T_J = 125^\circ\text{C}$		-	-	250	μA

ON CHARACTERISTICS

Static Drain-Source On-Resistance, $V_{GS} = 10\ \text{Vdc}$, $I_D = 10\ \text{A}$	$R_{DS(on)}$	-	-	8	m
$T_J = 100^\circ\text{C}$		-	-	16	m

DYNAMIC CHARACTERISTICS

Output Capacitance	$V_{DS} = 25\ \text{V}$, $V_{GS} = 0$, $f = 1.0\ \text{MHz}$	C_{OSS}	-	2000	-	pF
Reverse Transfer Capacitance		C_{rss}	-	400	-	pF

SWITCHING CHARACTERISTICS

Turn-On Delay Time	$V_{DD} = 30\ \text{V}$, $I_D = 150\ \text{A}$	$t_{d(on)}$	-	1000	-	ns
Rise Time		t_r	-	500	-	ns
Turn-Off Delay Time		$t_{d(off)}$	-	1000	-	ns
Fall Time		t_f	-	250	-	ns

SOURCE DRAIN DIODE CHARACTERISTICS

Forward On-Voltage	$I_{SD} = 150\ \text{A}$, $V_{GS} = 0$	V_{SD}	-	-	1.1	V
Reverse Recovery Time		t_{rr}	-	50	-	ns
Reverse Recovered Charge		Q_{rr}	-	.2	-	μC

ELECTRICAL CHARACTERISTICS: OMD120N10FL/Per Switch ($T_C = 25^\circ\text{C}$ unless otherwise specified)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS					
Drain-Source Breakdown Voltage, $I_D = 500\ \mu\text{A}$, $V_{GS} = 0$	$V_{(BR)DSS}$	100	-	-	V
Zero Gate Voltage Drain Current = V_{GS} , $V_{DS} = \text{Max. Rat.}$	I_{DSS}	-	-	500	μA
$V_{DS} = \text{Max. Rat.} \times 0.8$, $T_C = 70^\circ\text{C}$		-	-	2000	μA

ON CHARACTERISTICS

Static Drain-Source On-Resistance, $V_{GS} = 10\ \text{Vdc}$, $I_D = 10\ \text{A}$	$R_{DS(on)}$	-	-	16	m
$T_C = 70^\circ\text{C}$		-	-	32	m

DYNAMIC CHARACTERISTICS

Output Capacitance	$V_{DS} = 25\ \text{V}$, $V_{GS} = 0$, $f = 1.0\ \text{MHz}$	C_{OSS}	-	2400	-	pF
Reverse Transfer Capacitance		C_{rss}	-	600	-	pF

SWITCHING CHARACTERISTICS

Turn-On Delay Time	$V_{DD} = 80\ \text{V}$, $I_D = 60\ \text{A}$ $R_{GS} = 50$, $V_{GS} = 10\ \text{V}$	$t_{d(on)}$	-	1000	-	ns
Rise Time		t_r	-	300	-	ns
Turn-Off Delay Time		$t_{d(off)}$	-	1000	-	ns
Fall Time		t_f	-	250	-	ns

SOURCE DRAIN DIODE CHARACTERISTICS

Forward On-Voltage	$I_{SD} = 120\ \text{A}$, $V_{GS} = 0$, $di/dt = 100\ \text{A}/\mu\text{Sec}$	V_{SD}	-	-	1.6	V
Reverse Recovery Time		t_{rr}	-	180	-	ns
Reverse Recovered Charge		Q_{rr}	-	4	-	μC

OMD150N06FL OMD120N10FL OMD60L60FL OMD50F60FL

ELECTRICAL CHARACTERISTICS: OMD60L60FL/Per Switch (T_C = 25°C unless otherwise specified)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS					
Collector Emitter Breakdown Voltage, I _C = 250 μA, V _{CE} = 0	V _{(BR)CES}	600	-	-	V
Zero Gate Voltage Drain Current, V _{CE} = Max. Rat., V _{GE} = 0	I _{CES}	-	-	.25	mA
V _{CE} = 0.8 Max. Rat., V _{GE} = 0, T _J = 125°C		-	-	1.0	mA

ON CHARACTERISTICS

Collector Emitter Saturation Voltage, V _{GE} = 15 V, I _C = 60 A, T _C = 25°C	V _{CE(sat)}	-	-	1.8	V
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DYNAMIC CHARACTERISTICS

Output Capacitance	V _{GE} = 0 V, V _{CE} = 25 V,	C _{oss}	-	350	-	pF
Reverse Transfer Capacitance	f = 1.0 mHz	C _{rss}	-	100	-	pF

SWITCHING CHARACTERISTICS

Turn-On Delay Time	V _{CC} = 480 V, I _C = 60 A V _{GE} = 15 V	t _{d(on)}	-	1000	-	ns
Rise Time		t _r	-	250	-	ns
Turn-Off Delay Time		t _{d(off)}	-	1000	-	ns
Fall Time		t _f	-	500	-	ns

SOURCE DRAIN DIODE CHARACTERISTICS

Maximum Forward Voltage	I _F = 60 A, T _C = 25°C	V _F	-	-	1.85	V
	I _F = 60 A, T _J = 125°C		-	-	1.5	
Maximum Reverse Current	V _R = 600 V, T _C = 25°C	I _r	-	-	200	μA
	V _R = 480 V, T _J = 125°C		-	-	14	mA
Reverse Recovery Time	I _F = 1 A, di/dt = 200 A/μS V _R = 30 V, T _J = 25°C	t _{rr}	-	-	50	nS

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ELECTRICAL CHARACTERISTICS: OMD150F60ML/Per Switch (T_C = 25°C unless otherwise specified)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS					
Collector Emitter Breakdown Voltage, I _C = 250 μA, V _{CE} = 0	V _{(BR)CES}	600	-	-	V
Zero Gate Voltage Drain Current, V _{CE} = Max. Rat., V _{GE} = 0	I _{CES}	-	-	.25	mA
V _{CE} = 0.8 Max. Rat., V _{GE} = 0, T _J = 125°C		-	-	1.0	mA

ON CHARACTERISTICS

Collector Emitter Saturation Voltage, V _{GE} = 15 V, I _C = 50 A, T _C = 25°C	V _{CE(sat)}	-	-	2.7	V
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DYNAMIC CHARACTERISTICS

Output Capacitance	V _{GE} = 0 V, V _{CE} = 25 V,	C _{oss}	-	350	-	pF
Reverse Transfer Capacitance	f = 1.0 mHz	C _{rss}	-	100	-	pF

SWITCHING CHARACTERISTICS

Turn-On Delay Time	V _{CC} = 480 V, I _C = 50 A V _{GE} = 15 V	t _{d(on)}	-	1000	-	ns
Rise Time		t _r	-	200	-	ns
Turn-Off Delay Time		t _{d(off)}	-	1000	-	ns
Fall Time		t _f	-	300	-	ns

SOURCE DRAIN DIODE CHARACTERISTICS

Maximum Forward Voltage	I _F = 100 A, T _C = 25°C	V _F	-	-	1.85	V
	I _F = 100 A, T _J = 125°C		-	-	1.5	
Maximum Reverse Current	V _R = 600 V, T _C = 25°C	I _r	-	-	200	μA
	V _R = 480 V, T _J = 125°C		-	-	14	mA
Reverse Recovery Time	I _F = 1 A, di/dt = 200 A/μS V _R = 30 V, T _J = 25°C	t _{rr}	-	-	50	nS

OMD150N06FL OMD120N10FL OMD60L60FL OMD50F60FL

ABSOLUTE MAXIMUM RATINGS Per Switch (T_C = 25°C unless otherwise noted)
IGBT / MOSFET

Parameters		150N06FL	120N10FL	60L60FL	50F60FL	Units
Plus Supply		60	100	600	600	V
I _C @ T _C = 25°C	Continuous Drain Current	150	120	75	75	A
I _C @ T _J = 100°C	Continuous Drain Current	130	90	60	50	A
I _C Pulsed	Pulsed Drain Current ¹	450	450	200	200	A
Junction-To-Case	Linear Derating Factor	1.0	1.67	1.67	1.67	W/°C
Junction-To-Ambient	Linear Derating Factor	.02	.02	.02	.02	W/°C
R _{thJC}	Junction-To-Case	1.0	.60	.60	.60	°C/W
R _{thJA}	Junction-To-Ambient	50	50	50	50	°C/W

Rectifier

PIV		60	100	600	600	V
I _O		150	120	60	50	A
t _{rr}		50	180	35	35	nsec

Gate Driver

V _{DD}	Either Chip	18	18	18	18	V
V _{LSD} to V _{HSD}		75	100	500	500	V
Logic Input Voltage		-0.3 to V _L	-0.3 to V _L	-0.3 to V _L	-0.3 to V _L	V
T _j		150	150	150	150	°C

MECHANICAL OUTLINE (LP-8)

