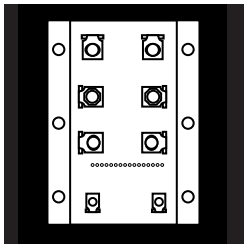
Preliminary Data Sheet OMS150N06FL OMS60L60FL OMS120N10FL OMS50F60FL

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



60 To 600 Volt, 50 To 150 Amp Modules, H-Bridge Configuration

FEATURES

- 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 the power semiconductors preconnected in an H-Bridge configuration.

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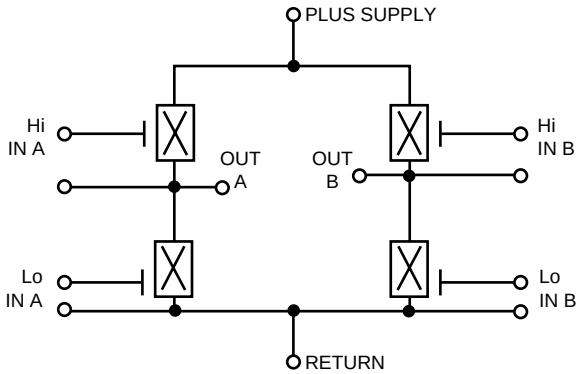
GENERAL CHARACTERISTICS (Per Switch) @ 25°C

Part Number	Power Device	Voltage (V)*	Current (A)	$R_{DS(on)}$ or $V_{CE(sat)}$	Fall Time
OMS150N06FL	MOSFET	60	150	8 m ohms	-
OMS120N10FL	MOSFET	100	120	16 m ohms	-
OMS60L60FL	IGBT	600	75	1.8 Volts	1 µs
OMS50F60FL	IGBT	600	75	2.7 Volts	500 ns

*Other voltages available.

SCHEMATIC



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

ELECTRICAL CHARACTERISTICS: OMS150N06FL/Per Switch (T_C = 25° unless otherwise specified)

Characteristic		Symbol	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage, I_D = 500 µA, V_{GS} = 0		$V_{(BR)DSS}$	60	-	-	V
Zero Gate Voltage Drain Current = V_{GS}, V_{DS} = Max. Rat.		I_{DSS}	-	-	25	µA
V_{DS} = Max. Rat. x 0.8, T_j = 125°C			-	-	250	µA
Gate-Body Leakage, V_{GS} = ±20 V		I_{GSS}	-	-	±200	nA
ON CHARACTERISTICS						
Gate-Threshold Voltage, V_{DS} = V_{GS}, I_D = 500 µA		$V_{GS(th)}$	2.0	-	4.0	V
Static Drain-Source On-Resistance, V_{GS} = 10 Vdc, I_D = 10 A		$R_{DS(on)}$	-	-	8	m
T_j = 100°C			-	-	16	m
DYNAMIC CHARACTERISTICS						
Forward Transconductance	V_{DS} > $I_{D(on)}$ X $R_{DS(on)}$ Max., I_D = 60A	g_{fs}	30	-	-	mho
Input Capacitance	V_{DS} = 25 V,	C_{iss}	-	6000	-	pF
Output Capacitance	V_{GS} = 0,	C_{oss}	-	2000	-	pF
Reverse Transfer Capacitance	f = 1.0 mHz	C_{rss}	-	400	-	pF
SWITCHING CHARACTERISTICS						
Turn-On Delay Time		$t_{d(on)}$	-	20	-	ns
Rise Time	V_{DD} = 30 V, I_D = 150 A,	t_r	-	225		ns
Turn-Off Delay Time	R_{GS} = 9.1 , V_{GS} = 10 V	$t_{d(off)}$	-	70	-	ns
Fall Time		t_f	-	125	-	ns
SOURCE DRAIN DIODE CHARACTERISTICS						
Source - Drain Current		I_{SD}	-	-	150	A
Source - Drain Current (Pulsed)	I_{SD} = 150 A,	I_{SDM}*	-	-	100	A
Forward On-Voltage	V_{GS} = 0,	V_{SD}	-	-	1.1	V
Reverse Recovery Time	I_{SD} = 13 A,	t_{rr}	-	50	-	ns
Reverse Recovered Charge	di/dt = 100 A/µSec	Q_{rr}	-	.20	-	µC

ELECTRICAL CHARACTERISTICS: OMS120N10FL/Per Switch (T_C = 25° unless otherwise specified)

Characteristic		Symbol	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage, I_D = 500 µA, V_{GS} = 0		$V_{(BR)DSS}$	100	-	-	V
Zero Gate Voltage Drain Current = V_{GS}, V_{DS} = Max. Rat.		I_{DSS}	-	-	500	µA
V_{DS} = Max. Rat. x 0.8, T_j = 125°C			-	-	2000	µA
Gate-Body Leakage, V_{GS} = ±20 V		I_{GSS}	-	-	±200	nA
ON CHARACTERISTICS						
Gate-Threshold Voltage, V_{DS} = V_{GS}, I_D = 500 µA		$V_{GS(th)}$	2.0	-	4.0	V
Static Drain-Source On-Resistance, V_{GS} = 10 Vdc, I_D = 10 A		$R_{DS(on)}$	-	-	16	m
T_j = 100°C			-	-	32	m
DYNAMIC CHARACTERISTICS						
Forward Transconductance	V_{DS} > $I_{D(on)}$ X $R_{DS(on)}$ Max., I_D = 60 A	g_{fs}	50	-	-	mho
Input Capacitance	V_{DS} = 25 V,	C_{iss}	-	8000	-	pF
Output Capacitance	V_{GS} = 0,	C_{oss}	-	2400	-	pF
Reverse Transfer Capacitance	f = 1.0 mHz	C_{rss}	-	600	-	pF
SWITCHING CHARACTERISTICS						
Turn-On Delay Time		$t_{d(on)}$	-	90	-	ns
Rise Time	V_{DD} = 80 V, I_D = 60 A,	t_r	-	270		ns
Turn-Off Delay Time	R_{GS} = 50 , V_{GS} = 10 V	$t_{d(off)}$	-	200	-	ns
Fall Time		t_f	-	210	-	ns
SOURCE DRAIN DIODE CHARACTERISTICS						
Source - Drain Current		I_{SD}	-	-	120	A
Source - Drain Current (Pulsed)	I_{SD} = 120 A,	I_{SDM}*	-	-	480	A
Forward On-Voltage	V_{GS} = 0,	V_{SD}	-	-	1.6	V
Reverse Recovery Time	I_{SD} = 13 A,	t_{rr}	-	180	-	ns
Reverse Recovered Charge	di/dt = 100 A/µSec	Q_{rr}	-	4	-	µC

* Indicates Pulse Test 300 µsec, Duty Cycle 1.5%

ELECTRICAL CHARACTERISTICS: OMS60L60FL/Per Switch (T_C = 25° unless otherwise specified)

Characteristic		Symbol	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS						
Collector Emitter Breakdown Voltage, I_C = 250 µA, V_{CE} = 0 V		$V_{(BR)CES}$	600	-	-	V
Zero Gate Voltage Drain Current , V_{CE} = Max. Rat., V_{GE} = 0 V		I_{CES}	-	-	.25	mA
V_{CE} = 0.8 Max. Rat., V_{GE} = 0 V, T_j = 125°C			-	-	1.0	mA
Gate Emitter Leakage Current, V_{GE} = ±20 V, V_{CE} = 0 V		I_{GES}	-	-	±100	nA
ON CHARACTERISTICS						
Gate-Threshold Voltage, V_{CE} = V_{GE}, I_D = 0.25 mA		$V_{GE(th)}$	2.5	-	5.0	V
Collector Emitter Saturation Voltage, V_{GE} = 15 V, I_C = 60 A, T_j = 25°C		$V_{CE(sat)}$	-	-	1.8	V
DYNAMIC CHARACTERISTICS						
Forward Transconductance	V_{CE} = 10 V, I_C = 60 A	g_{fs}	30	-	-	mho
Input Capacitance	V_{GE} = 0,	C_{iss}	-	4000	-	pF
Output Capacitance	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		t_{don}	-	50	-	ns
Rise Time	V_{CC} = 480 V, I_C = 60 A,	t_r	-	200		ns
Turn-Off Delay Time	R_{GS} = 2.7 , V_{GE} = 15 V	t_{doff}	-	600	-	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 µ/S V_R = 30 V, T_j = 25°C	t_{rr}	-	-	50	nS

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ELECTRICAL CHARACTERISTICS: OMS50F60FL/Per Switch (T_C = 25° unless otherwise specified)

Characteristic		Symbol	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS						
Collector Emitter Breakdown Voltage, I_C = 250 µA, V_{CE} = 0 V		$V_{(BR)CES}$	600	-	-	V
Zero Gate Voltage Drain Current , V_{CE} = Max. Rat., V_{GE} = 0 V		I_{CES}	-	-	0.25	mA
V_{CE} = 0.8 Max. Rat., V_{GE} = 0 V, T_j = 125°C			-	-	1.0	mA
Gate Emitter Leakage Current, V_{GE} = ±20 V, V_{CE} = 0 V		I_{GES}	-	-	±100	nA
ON CHARACTERISTICS						
Gate-Threshold Voltage, V_{CE} = V_{GE}, I_D = 0.25 mA		$V_{GE(th)}$	2.5	-	5.0	V
Collector Emitter Saturation Voltage, V_{GE} = 15 V, I_C = 50 A, T_j = 25°C		$V_{CE(sat)}$	-	-	2.7	V
DYNAMIC CHARACTERISTICS						
Forward Transconductance	V_{CE} = 10 V, I_C = 50 A	g_{fs}	25	-	-	mho
Input Capacitance	V_{GE} = 0,	C_{iss}	-	4000	-	pF
Output Capacitance	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		t_{don}	-	50	-	ns
Rise Time	V_{CC} = 480 V, I_C = 50 A,	t_r	-	250		ns
Turn-Off Delay Time	R_{GS} = 2.7 , V_{GE} = 15 V	t_{doff}	-	300	-	ns
Fall Time		t_f	-	600	-	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 µ/S V_R = 30 V, T_j = 25°C	t_{rr}	-	-	50	nS

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
V_{CER}	(R_{ge} = 20 K)	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

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MECHANICAL OUTLINE (LP-8)