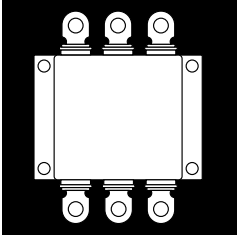


Preliminary Data Sheet

OM60L60PB OM45L120PB
OM50F60PB OM35F120PB

DUAL IGBTs IN HERMETIC ISOLATED POWER BLOCK PACKAGES



High Current, High Voltage 600V And 1200V,
Up To 75 Amp Dual IGBTs With FRED Diodes

FEATURES

- Includes Internal FRED Diode
- Rugged Package Design
- Solder Terminals
- Very Low Saturation Voltage
- Fast Switching, Low Drive Current
- Available Screened To MIL-S-19500, TX, TXV And S Levels
- Ceramic Feedthroughs

DESCRIPTION

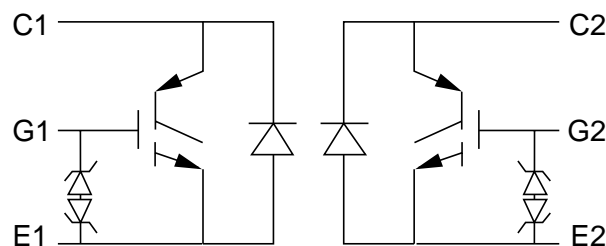
This series of hermetically packaged products feature the latest advanced IGBT technology combined with a package designed specifically for high efficiency, high current applications. They are ideally suited for Hi-Rel requirements where small size, high performance and high reliability are required, and in applications such as switching power supplies, motor controls, inverters, choppers, audio amplifiers and high energy pulse circuits.

GENERAL CHARACTERISTICS @ 25°C (Per Switch)

Part Number	V_{CE} (V)	I_c (A)	$V_{CE(sat)}$	Type
OM60L60PB	600	75	1.8 Volts	Lo Sat.
OM45L120PB	1200	70	3 Volts	Lo Sat.
OM50F60PB	600	75	2.7 Volts	Hi Speed
OM35F120PB	1200	70	4 Volts	Hi Speed

3.1

SCHEMATIC



OM60L60PB OM45L120PB OM50F60PB OM35F120PB

ELECTRICAL CHARACTERISTICS: OM60L60PB (T_C = 25°C unless otherwise specified)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
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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 _{GE} = 0, V _{CE} = Max. Rat. V _{CE} = 0.8 Max. Rat., V _{GE} = 0, T _C = 125°C	I _{CES}	-	-	0.25	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 _C = 250 μA	V _{GE(th)}	2.5	-	5.0	V
Collector Emitter Saturation Voltage, V _{GE} = 15 V, I _C = 60 A	V _{CE(sat)}	-	-	1.8	V

DYNAMIC CHARACTERISTICS

Forward Transconductance	V _{CE} = 10 V, I _C = 60 A	g _{fs}	30	-	-	S
Input Capacitance	V _{GE} = 0,	C _{iss}	-	4000	-	pF
Output Capacitance	V _{CE} = 25 V,	C _{oss}	-	340	-	pF
Reverse Transfer Capacitance	f = 1.0 MHz	C _{res}	-	100	-	pF

SWITCHING-INDUCTIVE RESISTIVE CHARACTERISTICS

Turn-On Delay Time	V _{CC} = 480 V, I _C = 60 A, R _{GS} = 2.7 Ω, V _{GS} = 15 V, L = 100 μH	t _{don}	-	50	-	nS
Rise Time		t _r	-	200	-	nS
Turn-Off Delay Time		t _{doff}	-	600	-	nS
Fall Time		t _f	-	500	-	nS

SWITCHING-INDUCTIVE LOAD CHARACTERISTICS

Turn-On Delay Time	V _{CE(samp)} = 480 V, I _C = 60 A	t _{don}	-	1000	-	nS
Fall Time	V _{GE} = 15 V, R _g = 2.7	t _f	-	1000	-	nS
Turn-Off Losses	L = 100 μH, T _J = 125°C	E _(OFF)	-	26	-	mWs

SOURCE DRAIN DIODE CHARACTERISTICS

Maximum Forward Voltage	I _F = 60 A, T _J = 25°C	V _F	-	-	1.85	V
	I _F = 60 A, T _J = 150°C		-	-	1.50	
Maximum Reverse Current	V _R = 600 V, T _J = 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

ELECTRICAL CHARACTERISTICS: OM45L120PB (T_C = 25°C unless otherwise specified)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
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OFF CHARACTERISTICS

Collector Emitter Breakdown Voltage, I _C = 3 mA, V _{CE} = 0 V	V _{BR(CES)}	1200	-	-	V
Zero Gate Voltage Drain Current, V _{GE} = 0, V _{CE} = Max. Rat. V _{CE} = 0.8 Max. Rat., V _{GE} = 0, T _C = 125°C	I _{CES}	-	-	3.0	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 _C = 4 mA	V _{GE(th)}	4.0	-	8.0	V
Collector Emitter Saturation Voltage, V _{GE} = 15 V, I _C = 45 A	V _{CE(sat)}	-	-	3.0	V

DYNAMIC CHARACTERISTICS

Forward Transconductance	V _{CE} = 10 V, I _C = 45 A	g _{fs}	26	-	-	S
Input Capacitance	V _{GE} = 0,	C _{iss}	-	4200	-	pF
Output Capacitance	V _{CE} = 25 V,	C _{oss}	-	290	-	pF
Reverse Transfer Capacitance	f = 1.0 MHz	C _{res}	-	65	-	pF

SWITCHING-INDUCTIVE RESISTIVE CHARACTERISTICS

Turn-On Delay Time	V _{CC} = 960 V, I _C = 45 A, R _{GS} = 2.7 Ω, V _{GS} = 15 V, L = 100 μH	t _{don}	-	80	-	nS
Rise Time		t _r	-	250	-	nS
Turn-Off Delay Time		t _{doff}	-	450	-	nS
Fall Time		t _f	-	1200	-	nS

SWITCHING-INDUCTIVE LOAD CHARACTERISTICS

Turn-On Delay Time	V _{CE(samp)} = 960 V, I _C = 45 A	t _{don}	-	450	-	nS
Fall Time	V _{GE} = 15 V, R _g = 2.7	t _f	-	1200	-	nS
Turn-Off Losses	L = 100 μH, T _J = 125°C	E _(OFF)	-	27	-	mWs

SOURCE DRAIN DIODE CHARACTERISTICS

Maximum Forward Voltage	I _F = 52 A, T _J = 25°C	V _F	-	-	2.55	V
	I _F = 52 A, T _J = 150°C		-	-	2.15	
Maximum Reverse Current	V _R = 1200 V, T _J = 25°C	I _R	-	-	2.2	mA
	V _R = 960 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}	-	-	60	nS

OM60L60PB OM45L120PB OM50F60PB OM35F120PB

ELECTRICAL CHARACTERISTICS: OM50F60PB (T_C = 25°C unless otherwise specified)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
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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 _{GE} = 0, V _{CE} = Max. Rat. V _{CE} = 0.8 Max. Rat., V _{GE} = 0, T _J = 125°C	I _{CES}	-	-	0.25	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 _C = 250 μA	V _{GE(th)}	2.5	-	5.0	V
Collector Emitter Saturation Voltage, V _{CE} = 15 V, I _C = 50 A	V _{CE(sat)}	-	-	2.7	V

DYNAMIC CHARACTERISTICS

Forward Transconductance	V _{CE} = 10 V, I _C = 50 A	g _{fs}	25	-	-	S
Input Capacitance	V _{GE} = 0,	C _{iss}	-	4000	-	pF
Output Capacitance	V _{CE} = 25 V,	C _{oss}	-	340	-	pF
Reverse Transfer Capacitance	f = 1.0 MHz	C _{rss}	-	100	-	pF

SWITCHING-INDUCTIVE RESISTIVE CHARACTERISTICS

Turn-On Delay Time	V _{CC} = 480 V, I _C = 50 A, R _{GS} = 2.7 Ω, V _{GS} = 15 V, L = 100 μH	t _(on)	-	50	-	nS
Rise Time		t _r	-	200	-	nS
Turn-Off Delay Time		t _(off)	-	200	-	nS
Fall Time		t _f	-	300	-	nS

SWITCHING-INDUCTIVE LOAD CHARACTERISTICS

Turn-On Delay Time	V _{CE(clamp)} = 480 V, I _C = 50 A	t _(on)	-	300	-	nS
Fall Time	V _{GE} = 15 V, R _θ = 2.7	t _f	-	600	-	nS
Turn-Off Losses	L = 100 μH, T _J = 125°C	E _(OFF)	-	9.6	-	mWs

SOURCE DRAIN DIODE CHARACTERISTICS

Maximum Forward Voltage	I _F = 60 A, T _J = 25°C	V _F	-	-	1.85	V
	I _F = 60 A, T _J = 150°C		-	-	1.50	
Maximum Reverse Current	V _R = 600 V, T _J = 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 _r	-	-	50	nS

ELECTRICAL CHARACTERISTICS: OM35L120PB (T_C = 25°C unless otherwise specified)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
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OFF CHARACTERISTICS

Collector Emitter Breakdown Voltage, I _C = 3 mA, V _{CE} = 0 V	V _{(BR)CES}	1200	-	-	V
Zero Gate Voltage Drain Current, V _{GE} = 0, V _{CE} = Max. Rat. V _{CE} = 0.8 Max. Rat., V _{GE} = 0, T _J = 125°C	I _{CES}	-	-	3.0	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 _C = 4 mA	V _{GE(th)}	4.0	-	8.0	V
Collector Emitter Saturation Voltage, V _{CE} = 15 V, I _C = 35 A	V _{CE(sat)}	-	-	4.0	V

DYNAMIC CHARACTERISTICS

Forward Transconductance	V _{CE} = 10 V, I _C = 35 A	g _{fs}	26	-	-	S
Input Capacitance	V _{GE} = 0,	C _{iss}	-	3800	-	pF
Output Capacitance	V _{CE} = 25 V,	C _{oss}	-	235	-	pF
Reverse Transfer Capacitance	f = 1.0 MHz	C _{rss}	-	60	-	pF

SWITCHING-INDUCTIVE RESISTIVE CHARACTERISTICS

Turn-On Delay Time	V _{CC} = 960 V, I _C = 35 A, R _{GS} = 2.7 Ω, V _{GS} = 15 V, L = 100 μH	t _(on)	-	80	-	nS
Rise Time		t _r	-	150	-	nS
Turn-Off Delay Time		t _(off)	-	400	-	nS
Fall Time		t _f	-	700	-	nS

SWITCHING-INDUCTIVE LOAD CHARACTERISTICS

Turn-On Delay Time	V _{CE(clamp)} = 960 V, I _C = 35 A	t _(on)	-	400	-	nS
Fall Time	V _{GE} = 15 V, R _θ = 2.7	t _f	-	1100	-	nS
Turn-Off Losses	L = 100 μH, T _J = 125°C	E _(OFF)	-	54	-	mWs

SOURCE DRAIN DIODE CHARACTERISTICS

Maximum Forward Voltage	I _F = 52 A, T _J = 25°C	V _F	-	-	2.55	V
	I _F = 52 A, T _J = 150°C		-	-	2.15	
Maximum Reverse Current	V _R = 1200 V, T _J = 25°C	I _R	-	-	2.2	mA
	V _R = 960 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 _r	-	-	60	nS

3.1

OM60L60PB OM45L120PB OM50F60PB OM35F120PB

ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

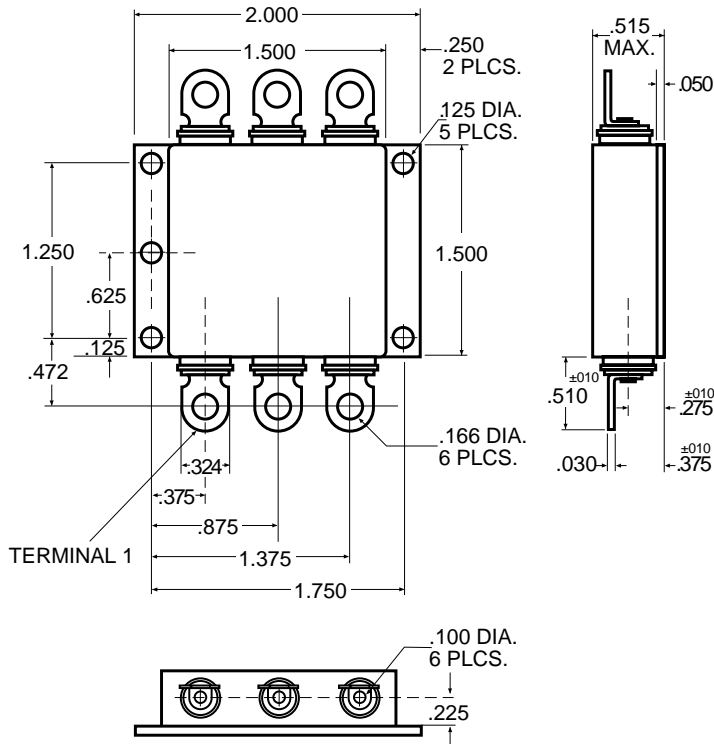
IGBT

Parameters		60L60HB	45L120HB	50F60HB	35F120HB	Units
V_{CE}	Drain Source Voltage	600	1200	600	1200	V
V_{CER}	Drain Gate Voltage ($R_{ge} = 20\text{ K}$)	600	1200	600	1200	V
$I_C @ T_C = 25^\circ\text{C}$	Continuous Drain Current	75	70	75	70	A
$I_C @ T_J = 90^\circ\text{C}$	Continuous Drain Current	60	45	50	35	A
I_C Pulsed	Pulsed Drain Current	200	180	200	140	A
Junction-To-Case	Linear Derating Factor	2	2	2	2	W/ $^\circ\text{C}$
Junction-To-Ambient	Linear Derating Factor	.03	.03	.03	.03	W/ $^\circ\text{C}$
R_{thJC}	Junction-To-Case	0.5	0.5	0.5	0.5	$^\circ\text{C}/\text{W}$
R_{thJA}	Junction-To-Ambient	30	30	30	30	$^\circ\text{C}/\text{W}$

Rectifier

PIV		600	1200	600	1200	V
I_O		60	52	60	52	A
t_{tr}		35	40	35	40	nSec

MECHANICAL OUTLINE



3.1