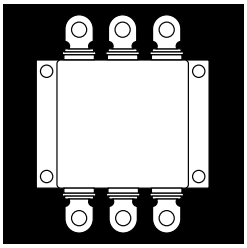
Preliminary Data Sheet

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

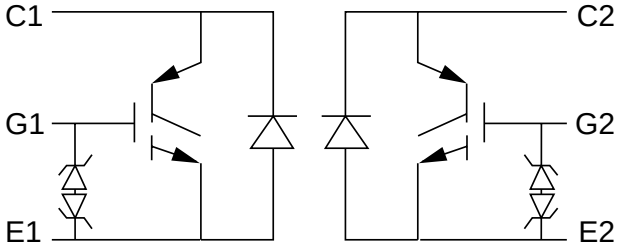
This series of hermetically packaged products feature the latest advanced IGBT technology combined with a package designed specifically for high efficiency, high current applications. They are ideally suited for Hi-Rel requirements where small size, high performance and high reliability are required,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

2.1

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

SCHEMATIC



ELECTRICAL CHARACTERISTICS: OM60L60PB (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		$V_{(BR)CES}$	600	-	-	V
Zero Gate Voltage Drain Current , V_{GE} = 0, V_{CE} = Max. Rat.		I_{CES}	-	-	0.25	mA
V_{CE} = 0.8 Max. Rat., V_{GE} = 0, T_C = 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_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_{rss}	-	100	-	pF
SWITCHING-INDUCTIVE RESISTIVE CHARACTERISTICS						
Turn-On Delay Time		$t_{d(on)}$	-	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_{GS} = 15 V,	$t_{d(off)}$	-	600	-	nS
Fall Time	L = 100 µH	t_f	-	500	-	nS
SWITCHING-INDUCTIVE LOAD CHARACTERISTICS						
Turn-On Delay Time	$V_{CE(damp)}$ = 480 V, I_C = 60 A	$t_{d(on)}$	-	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	-	m Ws
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 µ/S 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
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.		I_{CES}	-	-	3.0	mA
V_{CE} = 0.8 Max. Rat., V_{GE} = 0, T_j = 125°C			-	-	1.2	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_{rss}	-	65	-	pF
SWITCHING-INDUCTIVE RESISTIVE CHARACTERISTICS						
Turn-On Delay Time		$t_{d(on)}$	-	80	-	nS
Rise Time	V_{CC} = 960 V, I_C = 45 A,	t_r	-	250	-	nS
Turn-Off Delay Time	R_{GS} = 2.7 , V_{GS} = 15 V,	$t_{d(off)}$	-	450	-	nS
Fall Time	L = 100 µH	t_f	-	1200	-	nS
SWITCHING-INDUCTIVE LOAD CHARACTERISTICS						
Turn-On Delay Time	$V_{CE(damp)}$ = 960 V, I_C = 45 A	$t_{d(on)}$	-	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	-	m Ws
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 µ/S V_R = 30 V, T_j = 25°C	t_{rr}	-	-	60	nS

ELECTRICAL CHARACTERISTICS: OM50F60PB (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		$V_{(BR)CES}$	600	-	-	V
Zero Gate Voltage Drain Current , V_{GE} = 0, V_{CE} = Max. Rat.		I_{CES}	-	-	0.25	mA
V_{CE} = 0.8 Max. Rat., V_{GE} = 0, 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_C = 250 µA		$V_{GE(th)}$	2.5	-	5.0	V
Collector Emitter Saturation Voltage, V_{GE} = 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		$t_{d(on)}$	-	50	-	nS
Rise Time	V_{CC} = 480 V, I_C = 50 A,	t_r	-	200	-	nS
Turn-Off Delay Time	R_{GS} = 2.7 , V_{GS} = 15 V, L = 100 µH	$t_{d(off)}$	-	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	$t_{d(on)}$	-	300	-	nS
Fall Time	V_{GE} = 15 V, R_g = 2.7	t_f	-	600	-	nS
Turn-Off Losses	L = 100 µH, T_j = 125°C	$E_{(OFF)}$	-	9.6	-	m Ws
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 µ/S V_R = 30 V, T_j = 25°C	t_{rr}	-	-	50	nS

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

Characteristic		Symbol	Min.	Typ.	Max.	Unit
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.		I_{CES}	-	-	3.0	mA
V_{CE} = 0.8 Max. Rat., V_{GE} = 0, T_j = 125°C			-	-	1.2	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 = 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		$t_{d(on)}$	-	80	-	nS
Rise Time	V_{CC} = 960 V, I_C = 35 A,	t_r	-	150	-	nS
Turn-Off Delay Time	R_{GS} = 2.7 , V_{GS} = 15 V,	$t_{d(off)}$	-	400	-	nS
Fall Time	L = 100 µH	t_f	-	700	-	nS
SWITCHING-INDUCTIVE LOAD CHARACTERISTICS						
Turn-On Delay Time	$V_{CE(clamp)}$ = 960 V, I_C = 35 A	$t_{d(on)}$	-	400	-	nS
Fall Time	V_{GE} = 15 V, R_g = 2.7	t_f	-	1100	-	nS
Turn-Off Losses	L = 100 µH, T_j = 125°C	$E_{(OFF)}$	-	54	-	m Ws
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 µ/S V_R = 30 V, T_j = 25°C	t_{rr}	-	-	60	nS

OM60L60PB OM45L120PB OM50F60PB OM35F120PB

ABSOLUTE MAXIMUM RATINGS (T_C = 25°C unless otherwise noted)

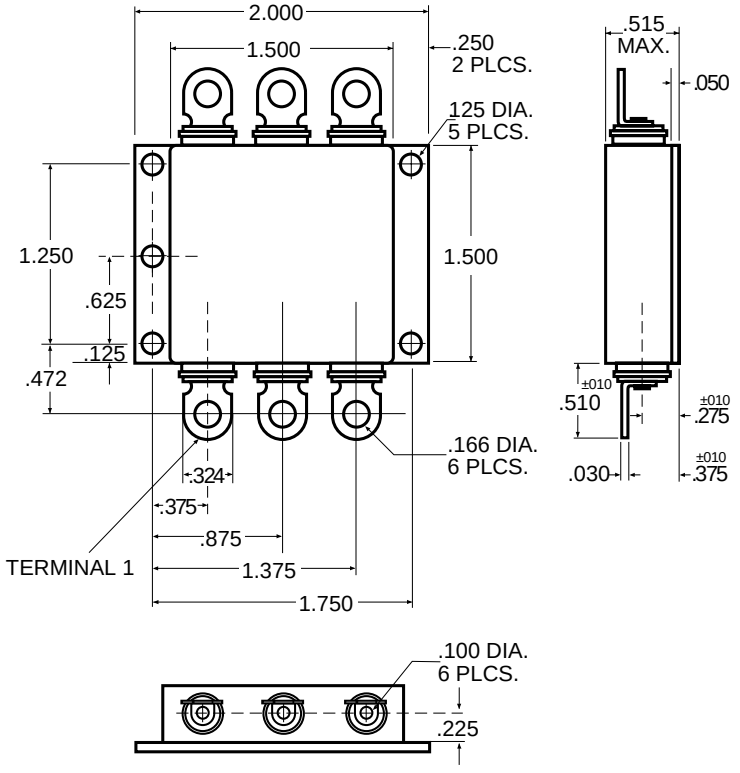
IGBT

Parameters		60L60PB	45L120PB	50F60PB	35F120PB	Units
V_{CE}	Drain Source Voltage	600	1200	600	1200	V
V_{CER}	Drain Gate Voltage (R_{ge} = 20 K)	600	1200	600	1200	V
I_C @ T_C = 25°C	Continuous Drain Current	75	70	75	70	A
I_C @ T_J = 90°C	Continuous Drain Current	60	45	50	35	A
I_C Pulsed	Pulsed Drain Current[1]	200	180	200	140	A
Junction-To-Case	Linear Derating Factor	2	2	2	2	W/°C
Junction-To-Ambient	Linear Derating Factor	.03	.03	.03	.03	W/°C
R_{thJC}	Junction-To-Case	0.5	0.5	0.5	0.5	°C/W
R_{thJA}	Junction-To-Ambient	30	30	30	30	°C/W

Rectifier

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

MECHANICAL OUTLINE



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