

TECHNICAL DATA
DATASHEET 4109, REV ENG-

Three-Phase IGBT BRIDGE, With Gate Driver and Optical Isolation

DESCRIPTION: A 1200 VOLT, 250 AMP, THREE PHASE IGBT BRIDGE

ELECTRICAL CHARACTERISTICS PER IGBT DEVICE

(T_j=25°C UNLESS OTHERWISE SPECIFIED)

PARAMETER		SYMBOL	MIN	TYP	MAX	UNIT
IGBT SPECIFICATIONS						
Collector to Emitter Breakdown Voltage I _C = 250 μA, V _{GE} = 0V		BV _{CES}	1200	-	-	V
Continuous Collector Current	T _C = 25 °C T _C = 90 °C	I _C	-	-	250 240	A
Pulsed Collector Current, 1mS		I _{CM}	-	-	600	A
Gate to Emitter Voltage		V _{GE}	-	-	+/-20	V
Gate-Emitter Leakage Current , V _{GE} = +/-20V		I _{GES}	-	-	+/- 300	nA
Gate Threshold Voltage, I _C =2mA		V _{GE(TH)}	3.0	-	6.0	V
Zero Gate Voltage Collector Current V _{CE} = 1200 V, V _{GE} =0V T _i =25°C V _{CE} = 900 V, V _{GE} =0V T _i =125°C		I _{CES}	-	-	5 40	mA mA
Collector to Emitter Saturation Voltage, I _C = 200A, V _{GE} = 15V,	T _C = 25 °C	V _{CE(SAT)}	-	2.5	2.8	V
Maximum Thermal Resistance		R _{θJC}	-	-	0.10	°C/W
Brake IGBT 60A Maximum Current					0.20	°C/W
Brake IGBT SPECIFICATIONS						
Continuous Collector Current	T _C = 25 °C T _C = 90 °C	I _C	-	-	150 120	A
Pulsed Collector Current, 0.5mS		I _{CM}	-	-	300	A
Over-Temperature Shutdown						
Over-Temperature Shutdown		Tsd	100	110	120	°C
Over-Temperature Shutdown Hysteresis				20		°C
Over-Temperature Output		Tso		10		10mV/°C

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ULTRAFAST DIODES RATING AND CHARACTERISTICS

Diode Peak Inverse Voltage	PIV	1200	-	-	V
Continuous Forward Current, $T_C = 90\text{ }^\circ\text{C}$	I_F	-	-	240	A
Forward Surge Current, $t_p = 10\text{ msec}$	I_{FSM}	-	-	700	A
Diode Forward Voltage, $I_F = 200\text{A}$	V_F	-	2.0	2.3	V
Diode Reverse Recovery Time ($I_F=200\text{A}$, $V_{RR}=600\text{V}$, $di/dt=200\text{ A}/\mu\text{s}$)	t_{rr}	-	180	250	nsec
Maximum Thermal Resistance	$R_{\theta JC}$	-	-	0.15	$^\circ\text{C}/\text{W}$
Gate Driver					
Supply Voltage	VCC	10	15	20	V
Input On Current	HIN, LIN	2		5.0	mA
Opto-Isolator Logic High Input Threshold	I_{th}	-	1.6	-	mA
Input Reverse Breakdown Voltage	BV_{in}	5.0	-	-	V
Input Forward Voltage @ $I_{in} = 5\text{mA}$	V_F	-	1.5	1.7	V
Under Voltage Lockout	VCCUV	7.0	-	9.7	V
ITRIP Reference Voltage ⁽¹⁾	Itrip-ref	1.45	1.5	1.55	V
Desaturation Over-Current Protection Blanking time ⁽²⁾		3	5	TBD	μsec
Input-to-Output Turn On Delay	t_{ond}	-		800	nsec
Output Turn On Rise Time	t_r	-		180	
Input-to-Output Turn Off Delay	t_{offd}	-		1000	
Output Turn Off Fall Time	t_f	-		160	
At VCC=300V, IC=50A, $T_C = 25$					
Input-Output Isolation Voltage	-	1000	-	-	V
Hall Current Sensors Gain, at DC bus, Phase A, and Phase		TBD	TBD	TBD	V/A

Maximum operating Junction Temperature	T_{jmax}	-40	-	150	$^\circ\text{C}$
Maximum Storage Junction Temperature	T_{jmax}	-55	-	150	$^\circ\text{C}$

(1) ITRIP Cycle-by cycle current limit is internally set to 200A peak. The set point can be lowered by connecting a resistor between Itrip-ref and Gnd. The set point can be increased by connecting a resistor between Itrip-ref and +5V ref

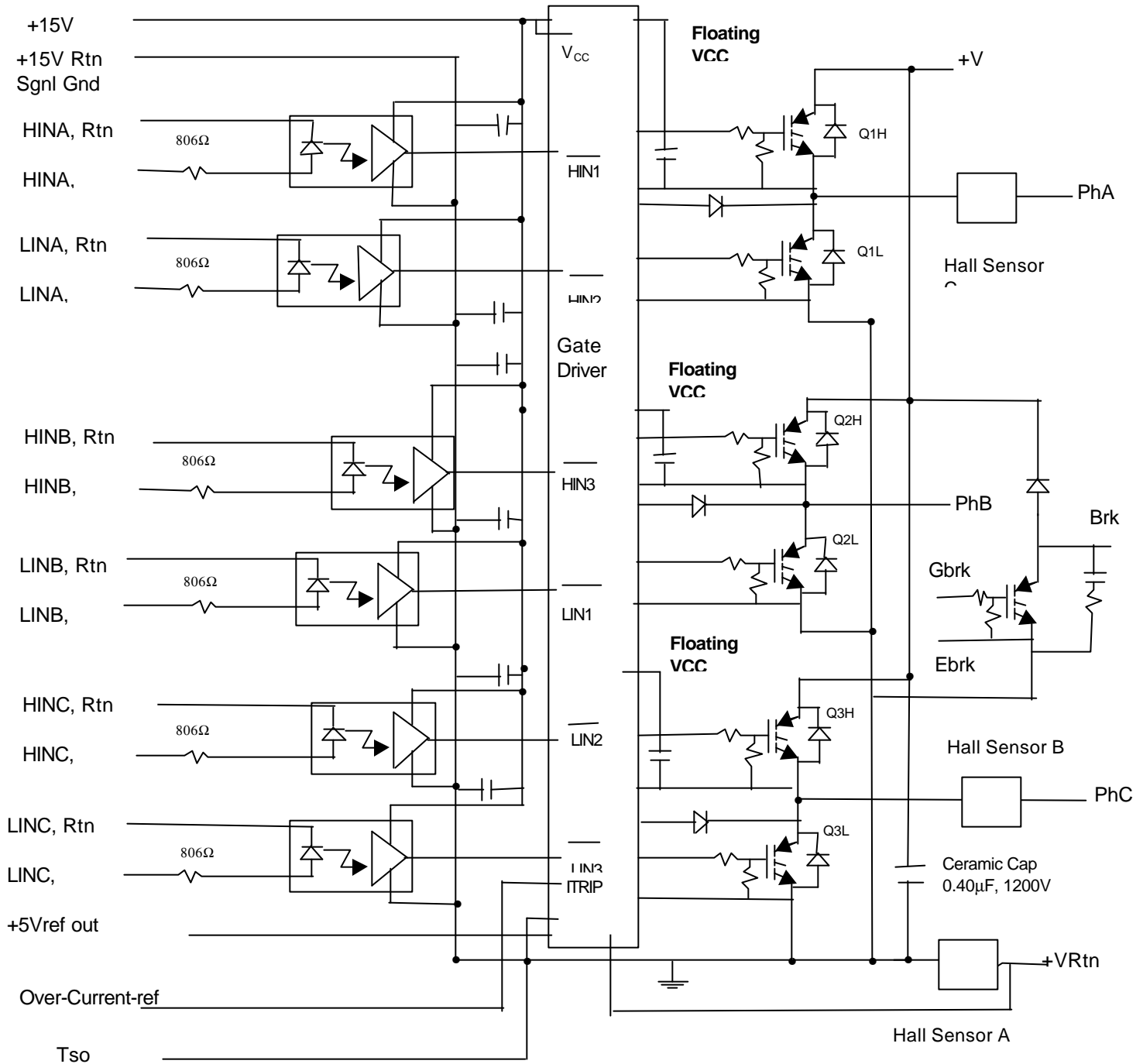
(2) Desaturation blanking maximum time is TBD and is only provided at the low-side IGBTs.

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Schematic Diagram:



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