1200 VOLT, 40 AMP MOSFET FULL-BRIDGE MODULE

Features

- Isolated base plate
- Light weight low profile standard package
- Aluminum Nitride substrate
- High temperature engineering plastic shell construction
- Enhanced die coating
- Die back metal change from silver to gold

ELECTRICAL CHARACTERISTICS PER MOSFET LEG

(T_J=25°C UNLESS OTHERWISE SPECIFIED)

SYMBOL	PARAMETER	MIN	TYP	MAX	UNIT
MOSFET SPECIFICATIONS					
BV_{DSS}	Drain to Source Breakdown Voltage I_D = 100 µA, V_{GS} = 0V	1200	-	-	V
I_D	Continuous Drain Current T_C = 25°C T_C = 100°C	-	-	60 40	A
$I_{D(pulse)}$	Pulsed Drain Current, 1ms	-	-	160	A
V_{GS}	Gate to Source Voltage	-	-	-10/+25	V
I_{GSS}	Gate-Source Leakage Current , V_{GS} = +20V / -5V	-	-	250	nA
$V_{GS(th)}$	Gate Threshold Voltage, T_J = 25°C I_D = 10mA, V_{DS} = V_{GS} T_J = 150°C	2.0 1.4	3.2 2.3	4.0 3.2	V
I_{DSS}	Zero Gate Voltage Drain Current V_{DS} = 1200 V, V_{GS}=0V	-	1	100	µA
$R_{DS(on)}$	Drain-Source On-State Resistance T_J = 25°C I_D = 40A, V_{GS} = 20V T_J = 150°C	- -	47 98	56 118	mΩ
C_{iss} C_{oss} C_{rss}	Input Capacitance Output Capacitance Reverse Transfer Cap. V_{DS} = 1000 V, V_{GS} = 0 V, f = 1 MHz, V_{AC} = 25 mV	- - -	2287 157 8	- - -	pF
$t_{D(on)}$ t_R $t_{D(off)}$ t_F	Turn On Delay Time Rise Time Turn Off Delay Time Fall Time V_{DS} = 800 V, I_D = 40A, V_{GS} = -5/+20V, R_G = 2.5Ω, R_L = 20Ω	- - - -	15 52 26 34	- - - -	ns
E_{AS}	Avalanche Energy, Single Pulse I_D = 40A, V_{DS} = 50V	-	2	-	J
E_{ON} E_{OFF}	Turn on Energy Loss Turn off Energy Loss V_{DS} = 800 V, I_D = 40A, V_{GS} = -5/+20V, R_G = 2.5Ω, L = 80µH	- -	1000 400	- -	µJ
$R_{G(int)}$	Internal Gate Resistance f = 1MHz, V_{AC} = 25mV	-	1.8	-	Ω
Q_{GS} Q_{GD} Q_G	Gate to Source Charge Gate to Drain Charge Total Gate Charge V_{DS} = 800 V, I_D = 40A, V_{GS} = -5/+20V	-	29 45 131	-	nC

DATASHEET 5487, REV F

REVERSE DIODE CHARACTERISTICS

(T_J=25°C UNLESS OTHERWISE SPECIFIED)

SYMBOL	PARAMETER	MIN	TYP	MAX	UNIT
DIODE SPECIFICATIONS					
V_{SD}	Diode Forward Voltage T_J = 25°C V_{GS} = -5V, I_{SD} = 20A T_J = 150°C	-	4.2 3.7	4.5 4.0	V
I_S	Continuous Forward Current, T_J = 25°C	-	-	60	A
t_{rr}	Reverse Recovery Time V_{GS} = -5V, I_{SD} = 40A, V_R =800V, di/dt = 1406A/ µs	-	63	-	ns
Q_{rr}	Reverse Recovery Charge V_{GS} = -5V, I_{SD} = 40A, V_R =800V, di/dt = 1406A/ µs	-	964	-	nC
I_{rrm}	Peak Reverse Recovery Current V_{GS} = -5V, I_{SD} = 40A, V_R =800V, di/dt = 1406A/ µs	-	18	-	A

ZVS SiC DIODE CHARACTERISTICS

(T_J=25°C UNLESS OTHERWISE SPECIFIED)

SYMBOL	PARAMETER	MIN	TYP	MAX	UNIT
DIODE SPECIFICATIONS					
V_{RRM}	Repetitive Peak Reverse Voltage	1200	-	-	V
V_{RSM}	Surge Peak Reverse Voltage	1300	-	-	V
V_R	DC Peak Blocking Voltage	1200	-	-	V
I_F	Continuous Forward Current, T_J = 150°C	-	-	5	A
I_{FRM}	Repetitive Peak Forward Surge Current T_C = 25°C t_P = 10ms, Half Sine Pulse T_C = 110°C	-	-	26 18	A
I_{FSM}	Non-Repetitive Forward Surge Current T_C = 25°C t_P = 10ms, Half Sine Pulse T_C = 110°C	-	-	46 36	A
V_F	Forward Voltage T_J = 25°C I_F = 5A T_J = 150°C	-	1.4 1.9	1.8 3.0	V
I_R	Reverse Current T_J = 25°C V_R = 1200V T_J = 150°C	-	20 40	150 300	µA
Q_C	Total Capacitive Charge V_R = 800V, I_F = 5A, di/dt = 200A/µs, T_J = 25 °C	-	27	-	nC
C	Total Capacitance V_R = 0V, T_J = 25 °C, f = 1MHz V_R = 400V, T_J = 25 °C, f = 1MHz V_R = 800V, T_J = 25 °C, f = 1MHz	-	390 27 20	-	pF

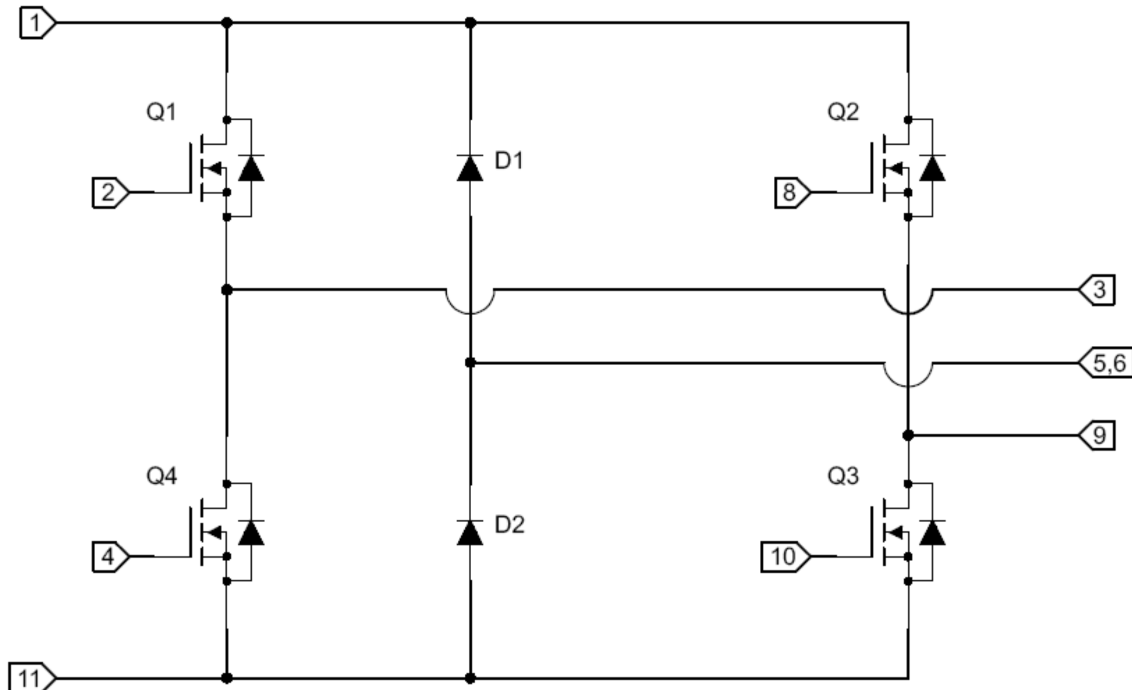
Note: Production units are only tested at room temperature. Low/High temperature operation is guaranteed by design.

THERMAL AND MECHANICAL CHARACTERISTICS

SYMBOL	PARAMETER	MIN	TYP	MAX	UNIT
$R_{\theta JB_M}$	MOSFET Junction-to-Base Plate Thermal Resistance Per Leg	-	0.30	0.36	ºC/W
$R_{\theta JB_D}$	Diode Junction-to-Base Plate Thermal Resistance Per Leg	-	1.60	1.76	ºC/W
V_{iso}	Isolation to Base Plate	-	-	2500	VDC
T_J	Operating Junction Temperature	-55	-	150	ºC
T_{STG}	Storage Temperature	-55	-	150	ºC
	Mounting Torque for Module Mounting	3	-	4	in-lbs.
	Weight	-	10	-	g

Recommended TIM = Laird Tgon 805

Schematic Diagram:



Note: Pin 7 is not used (No Connect)

Mechanical Outline (inches):

1.90 MAX
1.688
2X Ø.125 THRU
SENSITRON SEMICONDUCTOR
.960
.480
1 2 3 4 5 6 7 8 9 10 11
.060
.194 ±.010
.030
.000 .150 .250 .400 .550 .650 .800 .950 1.050 1.200 1.300
.060
.13
.060 TYP
.015
.190

TOLERANCE UNLESS OTHERWISE NOTED:
.XX = ±.010
.XXX = ±.005

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