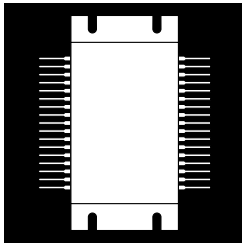


## DUAL, LOW VOLTAGE, LOW $R_{DS(on)}$ , MOSFET H-BRIDGE CIRCUIT IN A PLASTIC PACKAGE



**Dual 100 Volt, 15 To 20 Amp H-Bridge  
With Current And Temperature Sensing  
In A Low Profile Plastic Package**

### FEATURES

- H-Bridge Configuration
- Zener Gate Protection
- 10 m  $\Omega$  Shunt Resistor
- 2 Linear Thermal Sensors, One For Each Bridge
- Isolated Package
- Output Currents Up To 20 Amps

### DESCRIPTION

This series of MOSFET switches is configured as a Dual H-Bridge with common  $V_{DD}$  lines, precision series shunt resistor in the source line, and sensing elements to monitor the substrate temperature of each switch. This device is ideally suited for Stepping Motor Control applications where size, performance, and efficiency are key.

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### MAXIMUM RATINGS ( $T_C = @ 25^\circ\text{C}$ )

Part Number	$V_{DS}$ (Volts)	$R_{DS(on)}$ (m $\Omega$ )	$I_D$ (Amps)	Package
OMH410	100	58	15	MP-3

## OMH410

### ELECTRICAL CHARACTERISTICS: OMH410 ( $T_C = 25^\circ$ unless otherwise specified)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
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#### OFF CHARACTERISTICS

Drain-Source Breakdown Voltage, $I_D = 250 \mu\text{A}$ , $V_{GS} = 0$	$V_{(BR)DSS}$	100	-	-	V
Zero Gate Voltage Drain Current = $V_{GS}$ , $V_{DS} = \text{Max. Rat.}$	$I_{DSS}$	-	-	10	$\mu\text{A}$
$V_{DS} = \text{Max. Rat.} \times 0.8$ , $T_C = 70^\circ\text{C}$		-	-	100	$\mu\text{A}$
Gate-Body Leakage, $V_{GS} = \pm 12 \text{ V}$	$I_{GSS}$	-	-	$\pm 500$	nA

#### ON CHARACTERISTICS

Gate-Threshold Voltage, $V_{DS} = V_{GS}$ , $I_D = 250 \mu\text{A}$	$V_{GS(th)}$	2.0	-	4.0	V
Static Drain-Source On-Resistance, $V_{GS} = 10 \text{ Vdc}$ , $I_D = 9.0 \text{ A}$	$R_{DS(on)}$	-	-	0.058	
$T_C = 70^\circ\text{C}$		-	-	0.1	
On State Drain Current, $V_{DS} > I_{D(on)} \times R_{DS(on)}$ Max., $V_{GS} = 10 \text{ V}$	$I_{D(on)}$	15	-	-	A

#### DYNAMIC CHARACTERISTICS

Forward Transconductance, $V_{DS} > I_{D(on)} \times R_{DS(on)}$ Max., $I_D = 9.0\text{A}$	$g_{fs}$	9.0	-	-	mho	
Input Capacitance	$V_{DS} = 25 \text{ V}$ , $V_{GS} = 0$ , $f = 1.0 \text{ MHz}$	$C_{iss}$	-	-	2600	pF
Output Capacitance		$C_{oss}$	-	-	910	pF
Reverse Transfer Capacitance		$C_{rss}$	-	-	350	pF

#### SWITCHING CHARACTERISTICS

Turn-On Delay Time	$V_{DD} = 100 \text{ V}$ , $I_D = 15 \text{ A}$ , $R_{GS} = 10 \Omega$ , $V_{GS} = 10 \text{ V}$	$t_{d(on)}$	-	-	35	ns
Rise Time		$t_r$	-	-	290	ns
Turn-Off Delay Time		$t_{d(off)}$	-	-	85	ns
Fall Time		$t_f$	-	-	120	ns

#### SOURCE DRAIN DIODE CHARACTERISTICS

Source - Drain Current		$I_{SD}$	-	-	14	A
Source - Drain Current Pulsed		$I_{SDM}^*$	-	-	56	A
Forward On-Voltage, $I_{SD} = 28 \text{ A}$ , $V_{GS} = 0$		$V_{SD}$	-	-	2.5	V
Reverse Recovery Time	$I_{SD} = 13 \text{ A}$ , $di/dt = 100 \text{ A}/\mu\text{Sec}$	$t_{rr}$	-	133	-	ns
Reverse Recovered Charge		$Q_{rr}$	-	0.85	-	$\mu\text{C}$

#### RESISTOR CHARACTERISTICS

Resistor Tolerance	$R_S$	9.0	10	11	m
Temperature Coefficient, $-40^\circ\text{C}$ to $+70^\circ\text{C}$	$T_{cr}$	-	100	-	ppm

\* Indicates Pulse Test 300  $\mu\text{sec}$ , Duty Cycle 1.5%

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

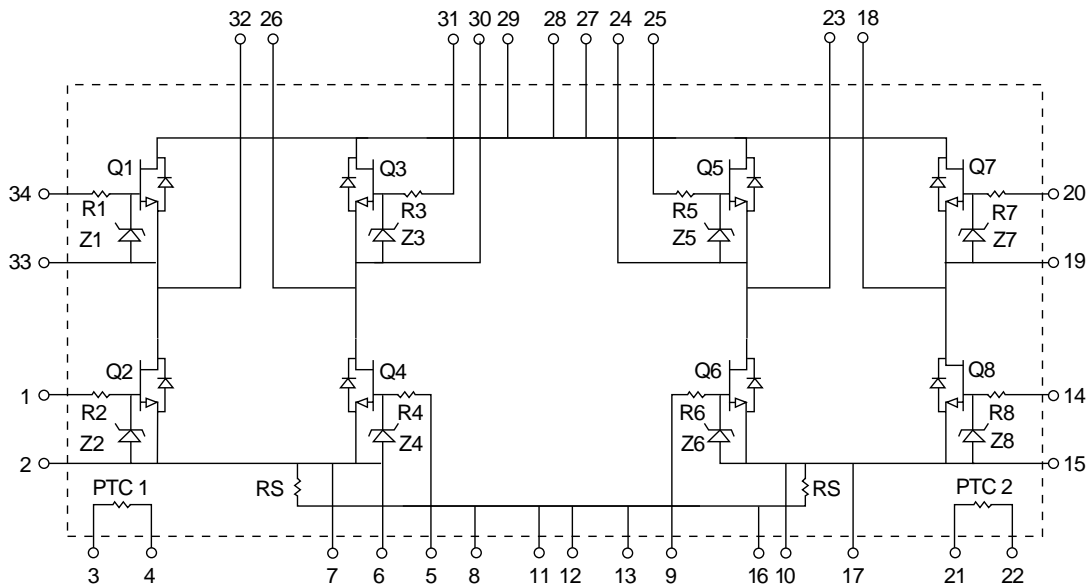
Drain Source Voltage, $V_{DS}$ .....	100 V
Drain-Gate ( $R_{GS} = 1\text{m}$ ), $V_{DGR}$ .....	100 V
Continuous Drain Current, $I_D @ T_C = 25^\circ\text{C}$ .....	15 A
$I_D @ T_C = 70^\circ\text{C}$ .....	11 A
Pulse Drain Current $I_{DM}^{(1)}$ .....	110 A
Maximum Power Dissipation, $P_D @ T_C = 25^\circ\text{C}^{(2)}$ .....	33 W
$P_D @ T_C = 70^\circ\text{C}^{(2)}$ .....	18 W
Linear Derating Factor, Junction-To-Case .....	0.33 W/C
Thermal Resistance, Junction-To-Case .....	3.0° C/W
Sense Resistor .....	0.010

Notes:

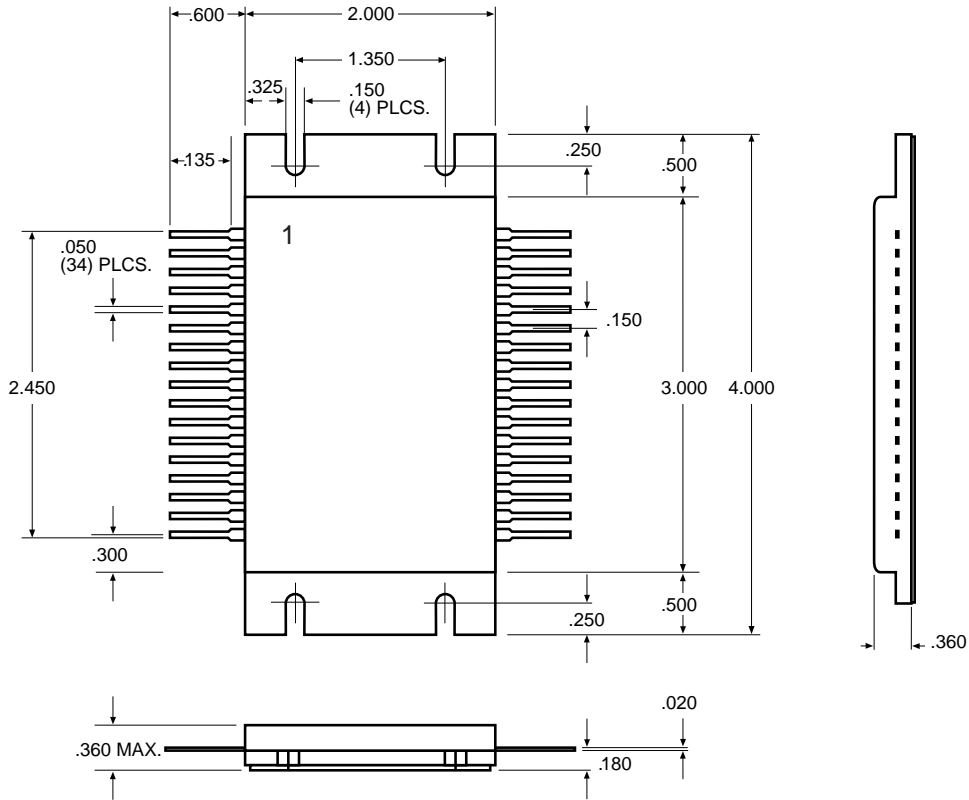
- (1) Pulse Test: Pulse width 300 sec. Duty Cycle 1.5%.
- (2) Maximum Junction Temperature = 125°C.

**SCHEMATIC**

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## MECHANICAL OUTLINE



Pin 1: Gate Q2	Pin 34: Gate Q1
Pin 2: Source Q2	Pin 33: Source Q1
Pin 3: PTC 1	Pin 32: Output Q1, Q2
Pin 4: PTC 1	Pin 31: Gate Q3
Pin 5: Gate Q4	Pin 30: Source Q3
Pin 6: Source Q4	Pin 29: $V_M$
Pin 7: Sense R 1	Pin 28: $V_M$
Pin 8: Sense R 1	Pin 27: $V_M$
Pin 9: Gate Q6	Pin 26: Output Q3, Q4
Pin 10: Source Q6	Pin 25: Gate Q5
Pin 11: Return Sense	Pin 24: Source Q5
Pin 12: Return	Pin 23: Output Q5, Q6
Pin 13: Return	Pin 22: +PTC
Pin 14: Gate Q8	Pin 21: -PTC
Pin 15: Source Q8	Pin 20: Gate Q7
Pin 16: Sense R 2	Pin 19: Source Q7
Pin 17: Sense R 2	Pin 18: Output Q7, Q8

Contact factory for lead bending options.  
 Mounting Recommendations: Maximum Mounting Torque: 3.0 mN.  
 The module must be attached to a flat heat sink (flatness 100µm maximum).