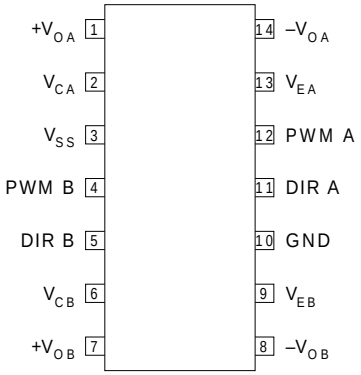
IP1M10 SERIES
IP1M12 SERIES

TOP VIEW



J Package – 14 Pin Ceramic DIP
N Package – 14 Pin Plastic DIP
D Package – 14 Pin Plastic (150) SOIC

200mA DUAL H-BRIDGE

FEATURES

- **200mA Continuous output current per bridge (100mA for IP1Mxx, IP2Mxx)**
- **Internal output clamp diodes**
- **Hysteretic logic inputs for noise immunity**
- **Thermal shutdown protection**
- **Peak current limit protection**
- **Crossover current blanking**
- **Separate +5V logic supply for minimum power dissipation (1M10 series only)**
- **Separate +7V to +36V logic supply (1M12 series only)**

Order Information

Part Number	J–Pack 14 Pin	N–Pack 14 Pin	D–14 14 Pin	Temp. Range
IP1M10	✔			-55 to +125°C
IP2M10	✔	✔	✔	-40 to +85°C
IP3M10	✔	✔	✔	0 to +70°C
IP1M12	✔			-55 to +125°C
IP2M12	✔	✔	✔	-40 to +85°C
IP3M12	✔	✔	✔	0 to +70°C

Note:
To order, add the package identifier to the part number.
eg. IP1M10J
IP2M10D–14
IP3M12N

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C unless otherwise stated)

V_{SS}	Logic Supply Voltage	1M10 Series	+7V
		1M12 Series	+40V
V_C	Driver Supply Voltage		+40V
	Logic Inputs		-0.3 to +40V
	Output Current		±250mA
	Peak Output Current		Internally Limited
P_D	Power Dissipation	T_A = 25°C	1W
	Derate above 50°C		10mW/°C
P_D	Power Dissipation	T_C = 25°C	2W
	Derate above 25°C		16mW/°C
T_J	Operating Junction Temperature		See Ordering Information
T_{STG}	Storage Temperature Range		–65 to +150°C

IP1M10 SERIES
IP1M12 SERIES

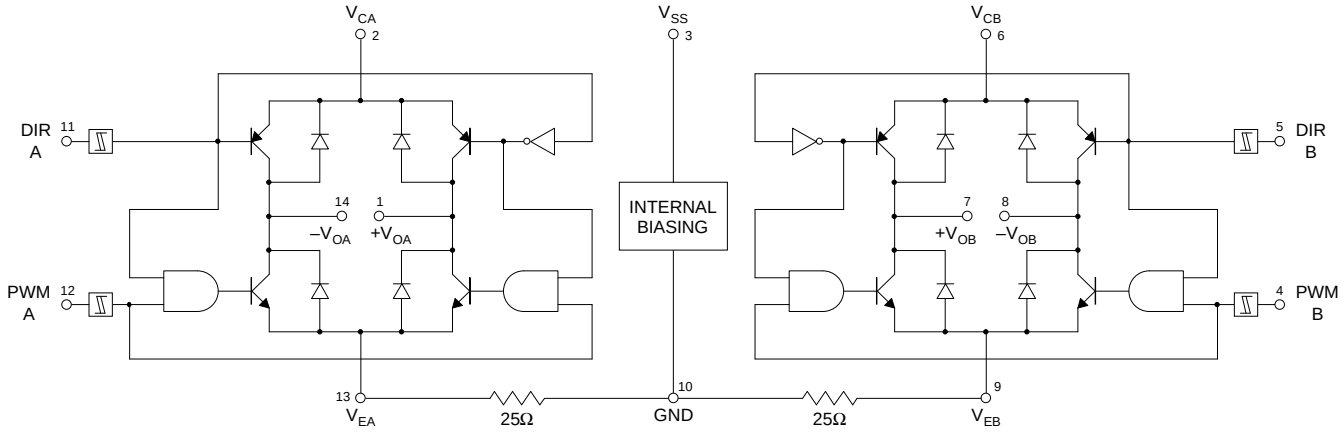
DESCRIPTION

The IP1M10 and IP1M12 series each contain two full H-bridge power drivers capable of delivering 200 mA continuous output current per channel (100mA for 1Mxx / 2Mxx). Each bridge may be run from its own supply voltage of up to 36V and is controlled by 2 high voltage protected logic level inputs with internal hysteresis for noise immunity.

Protection features include thermal shutdown, peak current limiting, crossover current blanking, and internal output clamp diodes. Logic supply current is provided by a separate pin so that standby power dissipation may be minimised. The IP1M10 series requires a +5V logic supply while the IP1M12 series requires a logic supply voltage of +7V or greater, and is typically used in single supply applications.

The IP1M10 and IP1M12 are available in a 14 lead ceramic DIP while the IP2M10, IP2M12, IP3M10, IP3M12 are available in the 14 lead ceramic DIP, 14 lead plastic DIP, and 14 lead plastic SOIC packages.

BLOCK DIAGRAM



INPUTS		OUTPUTS	
DIR	PWM	$+V_O$	$-V_O$
LOW	LOW	Z*	HIGH
LOW	HIGH	LOW	HIGH
HIGH	LOW	HIGH	Z*
HIGH	HIGH	HIGH	LOW

* Z = High Impedance.

RECOMMENDED OPERATING CONDITIONS

V_{SS}	Logic Supply Voltage	1M10 Series	+4.75 to +5.25V
		1M12 Series	+7 to +36V
V_C	Driver Supply Voltage		+4.75 to +36V
	Logic Inputs		0 to +36V
	Output Current, DC	1Mxx / 2Mxx Series	±100mA
		3Mxx Series	±200mA
	Peak Output Current	1Mxx / 2Mxx Series	±125mA
		3Mxx Series	±250mA
T_{AMB}	Operating Ambient Temperature Range	1Mxx Series	-55 to +125°C
		2Mxx Series	-40 to +85°C
		3Mxx Series	0 to +70°C

SEME LAB

IP1M10 SERIES
IP1M12 SERIES

ELECTRICAL CHARACTERISTICS (Over Full Operating Temperature Range)

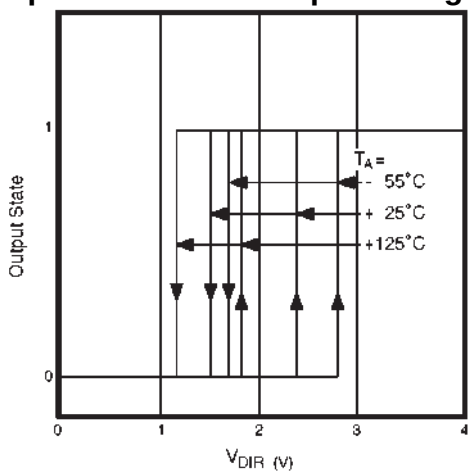
Parameter		Test Conditions		Min.	Typ.	Max.	Units
Logic Supply Voltage (Pin 3)	1M10 Series	V_{SS} = +5.25V	I_{LOADS} = 0		5	12	mA
		V_{SS} = +5.25V	I_{LOADS} = 100mA		8	20	
		V_{SS} = +5.25V	I_{LOADS} = 200mA		12	28	
Logic Supply Voltage (Pin 3)	1M12 Series	V_{SS} = +36V	I_{LOADS} = 0		8	18	
		V_{SS} = +36V	I_{LOADS} = 100mA		1	25	
		V_{SS} = +20V	I_{LOADS} = 200mA		15	32	
Quiescent Bridge Current (Pin 2 or 6)		I_{LOAD} = 0			2.5	8	mA
PWM Input Threshold (Pins 4 and 12)	Falling			0.8	1.5	2	V
	Rising			1.2	2.5	3	
	Hysterisis			0.4	1		
PWM Input Current (Pins 4 and 12)	Low	V_{IN} = 0			-20	-100	µA
	High	V_{IN} = 36V			0.1	±10	
DIR Input Threshold (Pins 5 and 11)	Falling			0.8	1.5	2	V
	Rising			1.2	2.3	3	
	Hysterisis			0.2	0.8		
DIR Input Current (Pins 5 and 11)	Low	V_{IN} = 0			-20	-100	µA
	High	V_{IN} = 36V			0.1	±10	
Total Saturation Voltage $V_{SAT(SINK)} + V_{SAT(SOURCE)}$		I_{LOAD} = 100mA			1.8	2.25	V
		I_{LOAD} = 200mA	3M10 / 3M12 Only		2.1	2.7	
Diode Forward Voltage		I_{DIODE} = 100mA			1.1	1.4	V
		I_{DIODE} = 200mA			1.2	1.6	
Output Leakage Current (Pins 1, 7, 8 and 14)	Low	V_O = 0	V_C = 36V		1	100	µA
	High	$V_O = V_C$ = 36V			1	100	

SWITCHING CHARACTERISTICS @ T_{AMB} = 25°C

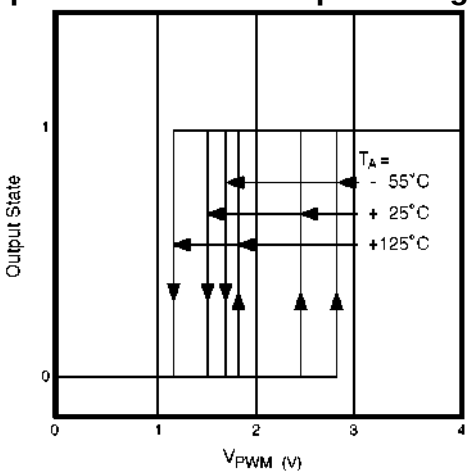
Parameter	Test Conditions	Min.	Typ.	Max.	Units
Sink Turn-On Delay	Δt: $V_i = V_{i(TH)}$ to $V_O = V_S$ /2		1250		ns
Sink Current Rise Time	Δt: I_O = (0.1 to 0.9) I_{LOAD}		200		
Sink Turn-Off Delay	Δt: $V_i = V_{i(TH)}$ to $V_O = V_S$ /2		300		
Sink Current Fall Time	Δt: I_O = (0.9 to 0.1) I_{LOAD}		200		
Source Turn-On Delay	Δt: $V_i = V_{i(TH)}$ to $V_O = V_S$ /2		800		ns
Source Rise Time	Δt: I_O = (0.1 to 0.9) I_{LOAD}		400		
Source Turn-Off Delay	Δt: $V_i = V_{i(TH)}$ to $V_O = V_S$ /2		1000		
Source Fall Time	Δt: I_O = (0.9 to 0.1) I_{LOAD}		500		
Sink to Source Deadtime			500		ns
Source to Sink Deadtime			250		

TYPICAL PERFORMANCE CHARACTERISTICS — ERROR AMPLIFIER

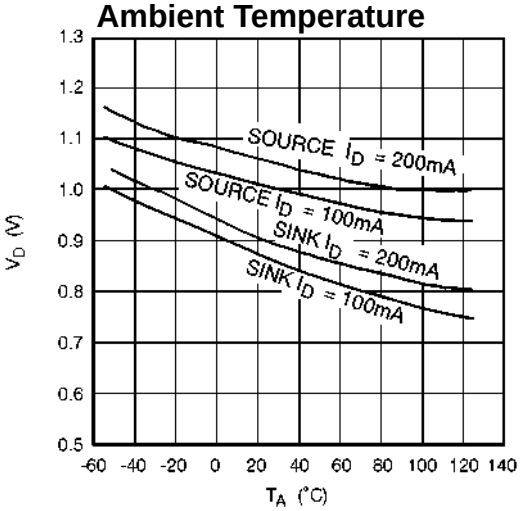
Output State vs DIR Input Voltage



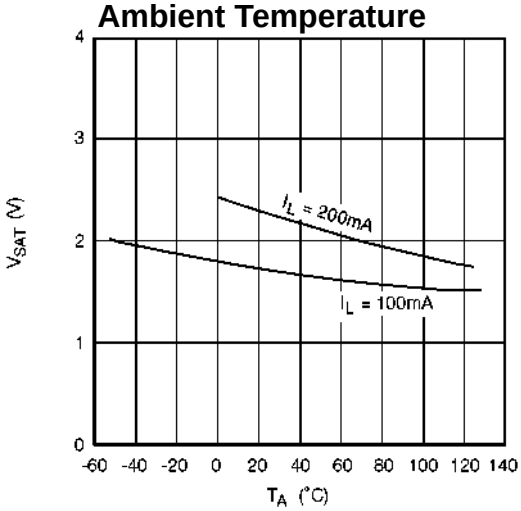
Output State vs PWM Input Voltage



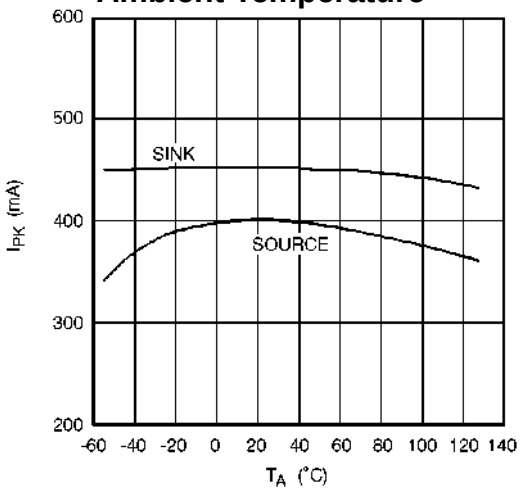
Diode Forward Voltage vs Ambient Temperature



Total Saturation Voltage vs Ambient Temperature



Peak Output Current vs Ambient Temperature



Logic Supply Current vs Ambient Temperature