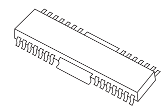
POWER ICs

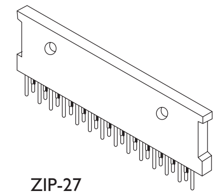
Stepping Motor Drivers ICs

Outline
The MTD series are monolithic power ICs that can be directly controlled through a CPU or a Gate Array with few external parts.

Applications
1. Stepping motor drive for office equipment products.
2. Stepping motor drive for industrial robots, and automatic equipment.



HSOP-28



ZIP-27

Type No.	Operation	Absolute Maximum Ratings (Ta=25°C) V_{CEO} [V]	I_O [A]	P_T [W]	Characteristics		Outline Package	Figure
MTD1110	Unipolar	80	2	5	Constant-Current chopping function	4-Phase input	ZIP-27	101
1120			1.2					
1120F				3			HSOP-28	102
★MTD1361	MOSFET	60	1.5	5		Low Loss MOS output	ZIP-27	101
MTD2001	Bipolar					Dual H-Bridge		
2003		30	1.2			Dual H-Bridge		
2003F				3		Current levels can be selected in 2 bit digital signal	HSOP-28	102
2005		60	1.3	5		Dual H-Bridge	ZIP-27	101
2005F			1.0	3		Selectable slow/fast current decay for microstepping	HSOP-28	102
2006		35	1.3	5		Dual H-Bridge	ZIP-27	101
2006F			1	3		Selectable slow/fast current decay for microstepping	HSOP-28	102
2007		50	1.3	5		Dual H-Bridge	ZIP-27	101
2007F			1	3		Automatic current decay speed	HSOP-28	102
2009J		35	1.2	2.8		Two Dual H-Bridges for control of two-stepping motors	HSOP-40	106
☆ 2015K		40	1.3	TBD		Two Dual H-Bridges with microstepping control	HSOP-36	TBD

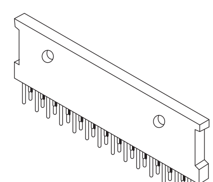
★: Under development ☆: New Product

Power ICs for Interface

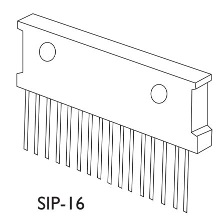
Outline
The MTA/MTB series are monolithic power ICs that were developed for use as needle print head drivers in dot matrix printers, and as stepping motor drivers.

Features
1. The input is TTL and CMOS compatible.
2. Large output I_C=2A or 4A, V_{CE}=60V or 80V
3. Insulated type single in-line packaging with heatsink installed

Applications
1. Head driver for dot matrix printers, ECR and time recorders
2. Stepping motor driver for printers, typewriters, FAX, PPC and XY plotters
3. Driver for all types of solenoids and displays (LED, etc.)



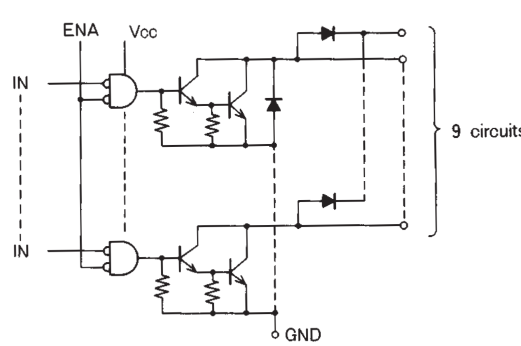
ZIP-27



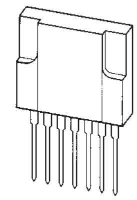
SIP-16

Type No.	I_C [A]	V_{CEO} [V]	P_T [W] Ta=25°C	Tc=25°C	Operation Input	Output	Circuits	Outline Package	Figure
MTA001M	2	80	5	35	L Active	NPN Darlington	9	ZIP-27	101
011					H Active				
002		60			L Active	PNP Darlington			
MTB001	4	80				NPN Darlington	4	SIP-16	103
011					H Active				

MTA001M circuit



IC Power Modules for Switching Power Supplies



Outline
This is an IC module for the primary side main circuits of RCC (Ringing Choke Converter) type switching power supplies.

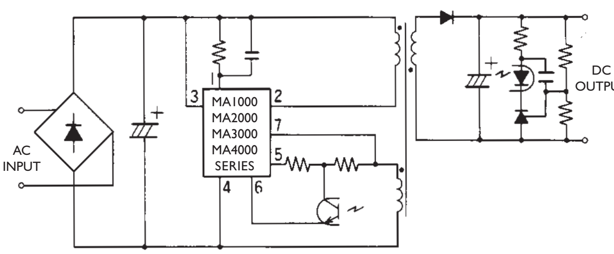
Features
1. Small number of externally mounted parts
2. Fold-back current limit characteristic
3. Soft start characteristic (MA1000, 2000, 3000 series)
4. High efficiency and low noise (MA3000 series)
5. Insulated type 7-terminal package

Type No.	Output transistor	Switching control mode	Remarks
MA1000 Series	Bipolar	RCC	—
MA2000 Series	Bipolar	RCC	*1
MA3000 Series	Bipolar	RCC (with quasi resonant)	*2
MA4000 Series	MOSFET	RCC	—

* 1: Control from the outside is easy because main transistor base terminal is joined to one of 7 pins.
* 2: Low noise, Low switching loss.

Type No.				Input Voltage [V]	Output capacity [W]	Remarks	Outline	
MA1000 series	MA2000 series *4	MA3000 series *5	MA4000 series *6				Package	Figure
MA1010	MA2410	—	—	90~132	20	—	MA7	104
1020	2420	—	MA4510		30			
—	—	MA3410	—		40			
1030	2430	—	4520		50			
—	2440	—	4530		80			
—	2450	3450	—		100			
1040	2810	3810	—	180~276	40	*3		
1050	2820	—	4810		60			
—	2830	3830	4820		100			

* 3: Wide input-range power supplies (90-276V) can be designed by adding a few extra external components (except MA3000 Series).
* 4: MA2000 Series : Overvoltage and output On-Off control can be implemented.
* 5: Quasi Resonant power supply can be designed with the same method as usual RCC power supply.
* 6: MA4000 Series : MOSFET is built in for the main converting section which makes high frequency operation possible.

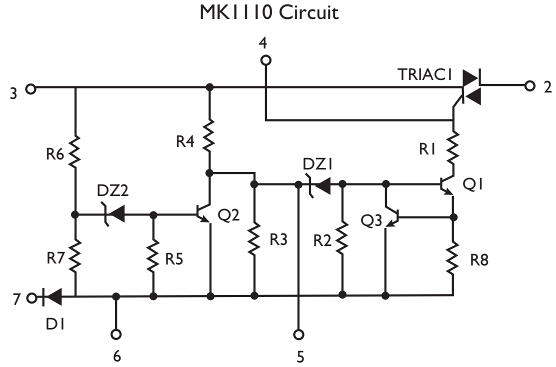


Circuit example for a switching P/S

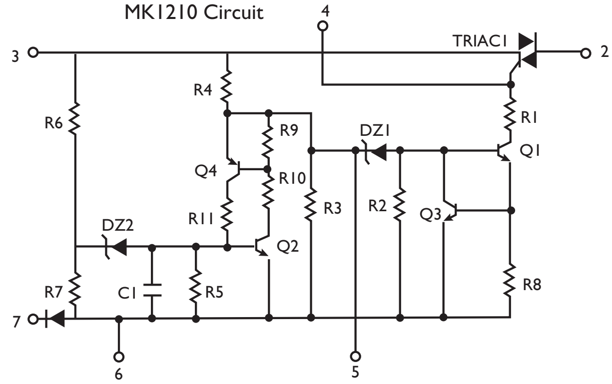
Automatic AC Line Voltage Selector

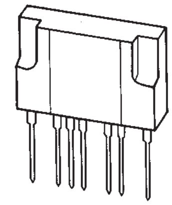
Type No.	VDRM [V]	IT (RMS) [A]	VS (DC) [V]	VC (DC) [V]	VUL (DC) [V]	Bridge Rectification Holding Function	Tstg [°C]	Top [°C]	Outline	
									Package	Figure
MK1110	500	10	90	208	—	Unavailable	–30~125	–10~100	MA7	104
MK1210					25	Available				

MK1110 Circuit



MK1210 Circuit

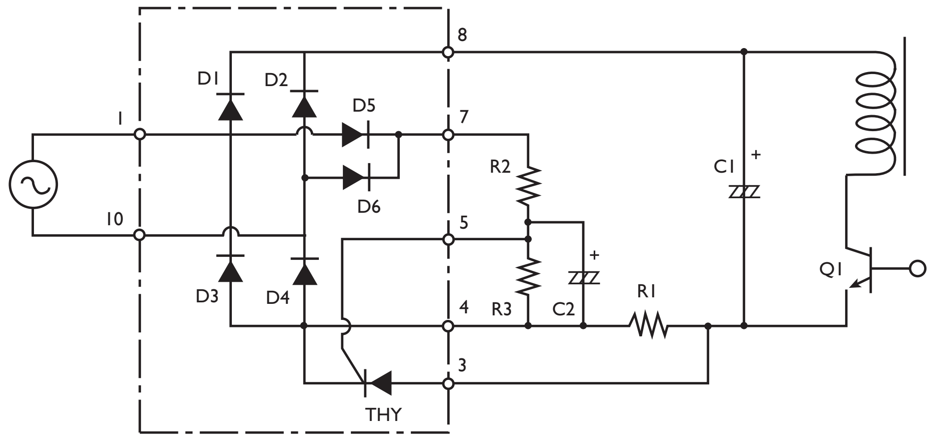


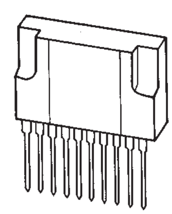


MA10

Inrush Current Suppression Hybrid IC

Type No.	V_{RM} [V]	I_O [A]		V_{RRM} [V]		I_{FSM} [A]	θja [°C/W]	θjc [°C/W]	Tstg [°C]	Tj [°C]		Outline	
		100V AC	200V AC	100V AC	200V AC					100V AC	200V AC	Package	Figure
MJ2400	600	3.4	1.9	200	400	80	27	2.9	–30~150	135	110	MA10	105





Full Bridge MOSFET Module

N-Channel, Enhancement type

Type No.	Absolute Maximum Ratings				Electrical Characteristics						Outline	
	Tch [°C]	V_{DSS} [V]	V_{GSS} [V]	I_D [A]	P_T [W]	$R_{DS\ (ON)}$ (max) [Ω]	C_{iss} (typ) [pF]	C_{rss} (typ) [pF]	t_{on} (typ) [ns]	t_{off} (typ) [ns]	Package	Figure
FH12MB45	150	450	±30	12	60	0.62	1200	90	90	190	—	93