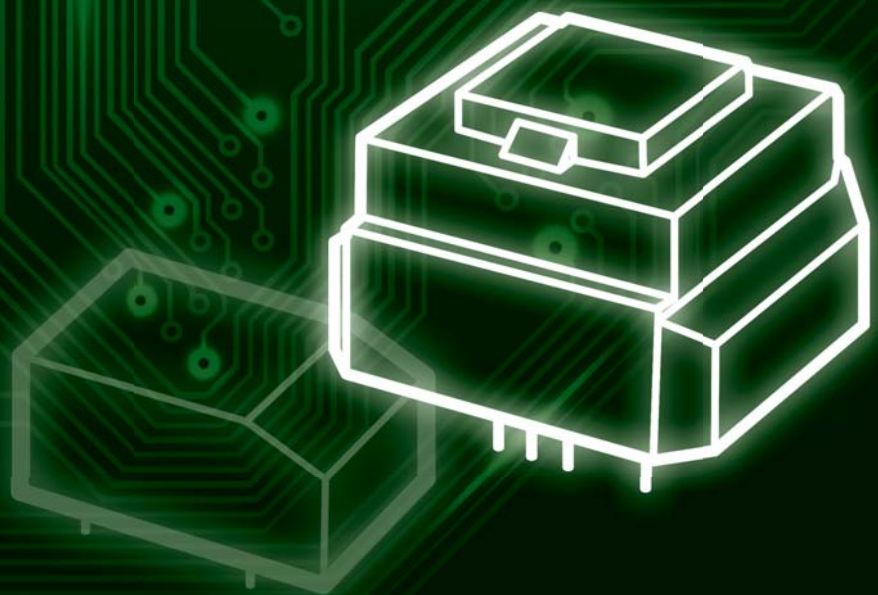


ELECTRONICS COMPONENTS

POWER SUPPLY MODULE



CONTENTS

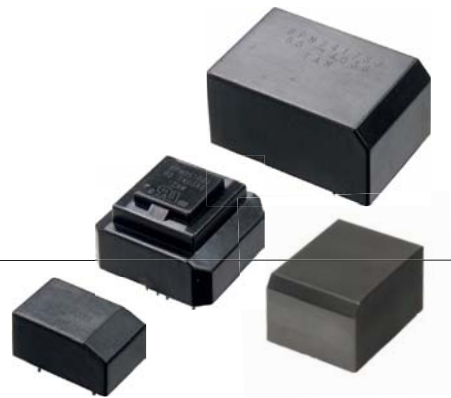
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Five Improvements by Power Supply Modules

Stand-by Power

Noise Reduction

Availability



Compact Form-Factor

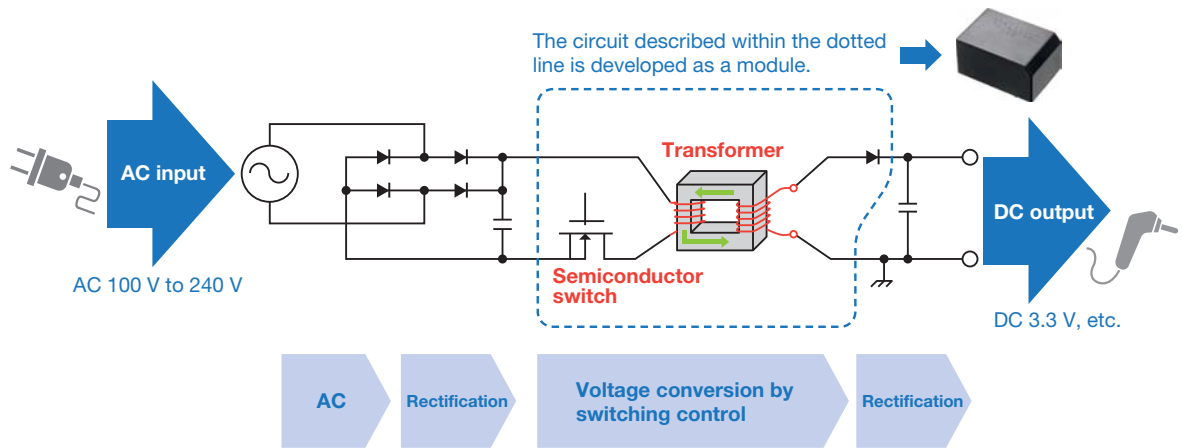
Facilitates Circuit Design

Switching power supply and power modules

Currently, a switching power supply is widely used to convert commercial AC power supplied to general households (AC 100 V in Japan) into DC power.

A switching power supply converts voltage by rapidly flipping a semiconductor switch on and off (about 100,000 times per second). As for its features, it offers high conversion efficiency and allows size and weight reduction. It is used in AC adapters for cellphones, smartphones, notebook PCs, etc.

Tamura has developed power modules that function as circuits of switching power supply, as described in “Voltage conversion by switching control” within the dotted line in the figure below. The integration of key devices—transformers, control circuits, and semiconductor switches—into a single package allows easy design of power supplies with a small number of components.



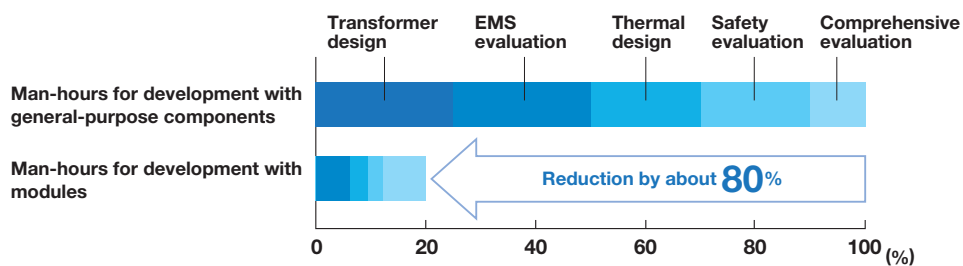
Features of power modules

■ Easy design of power supplies with high efficiency and low standby power consumption!

Tamura's power modules employ circuit technologies that incorporate know-how of original technologies Tamura has developed to achieve low standby power consumption and high efficiency. This facilitates the design of high-performance power supplies that can significantly reduce standby power consumption under no load and maintain high efficiency across the entire load range from low load to rated load.

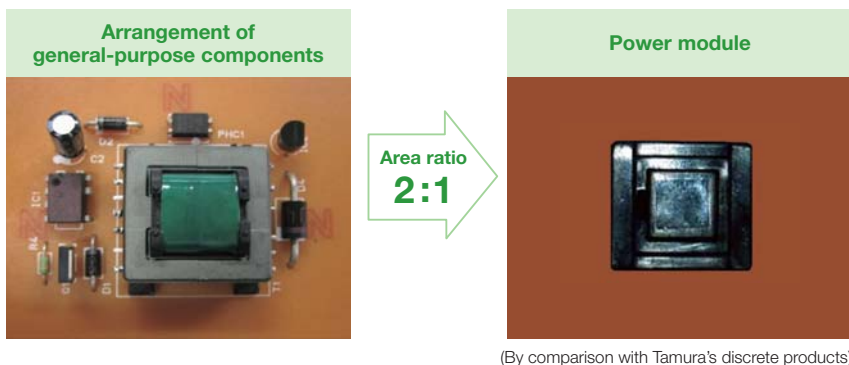
■ Significant reduction in man-hours for design and evaluation!

You can greatly simplify very important processes in power supply development—transformer design, thermal design, safety standard compliance, open and short circuit testing, and EMS evaluation. It is possible to reduce development man-hours required before mass production of power supplies by about 80%, thereby reducing development cost and time.



■ Reduction in mounting area

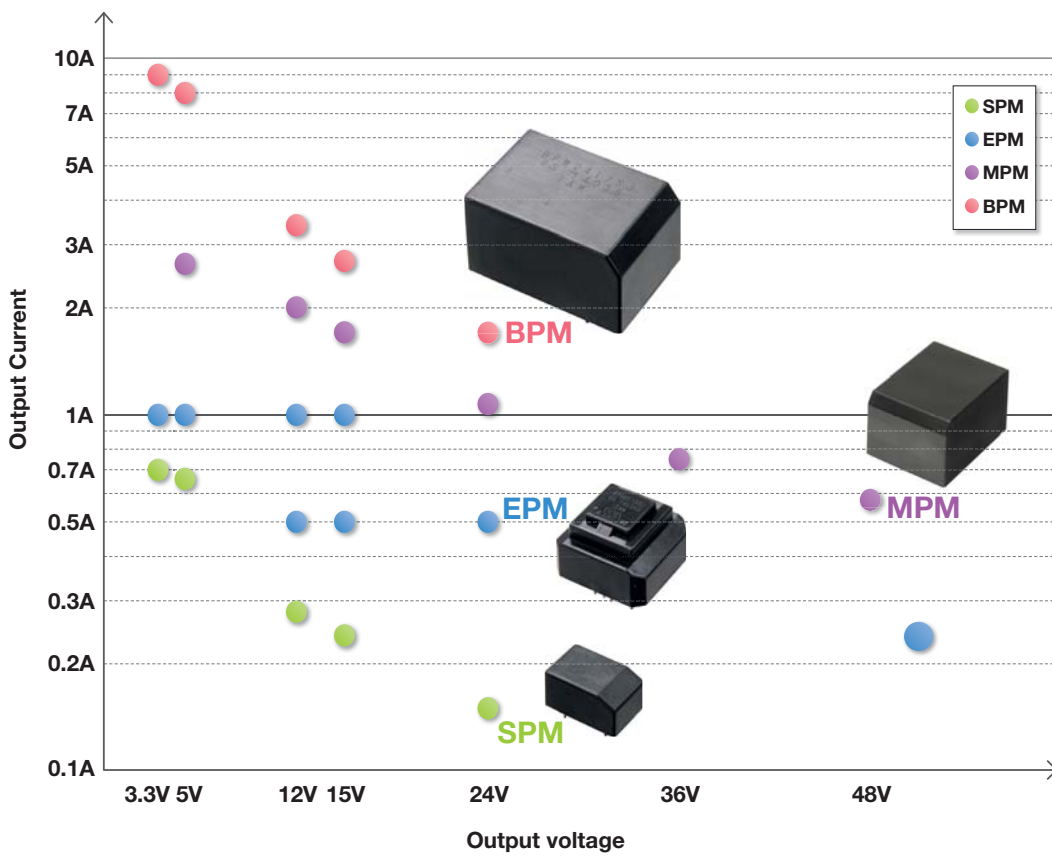
As the key components are housed in the modules, mounting area can be reduced to about half of that for an arrangement of general-purpose components.



Explanation of the Outline

With our original circuit technology, Tamura's power modules has the capability of design resource reduction, ultra-low standby power consumption and high efficiency. And also have made it possible to have low standby power & high efficiency at low power external components. Will contribute design time and development cost reduction.

Output Current / Output voltage



Product Lineup

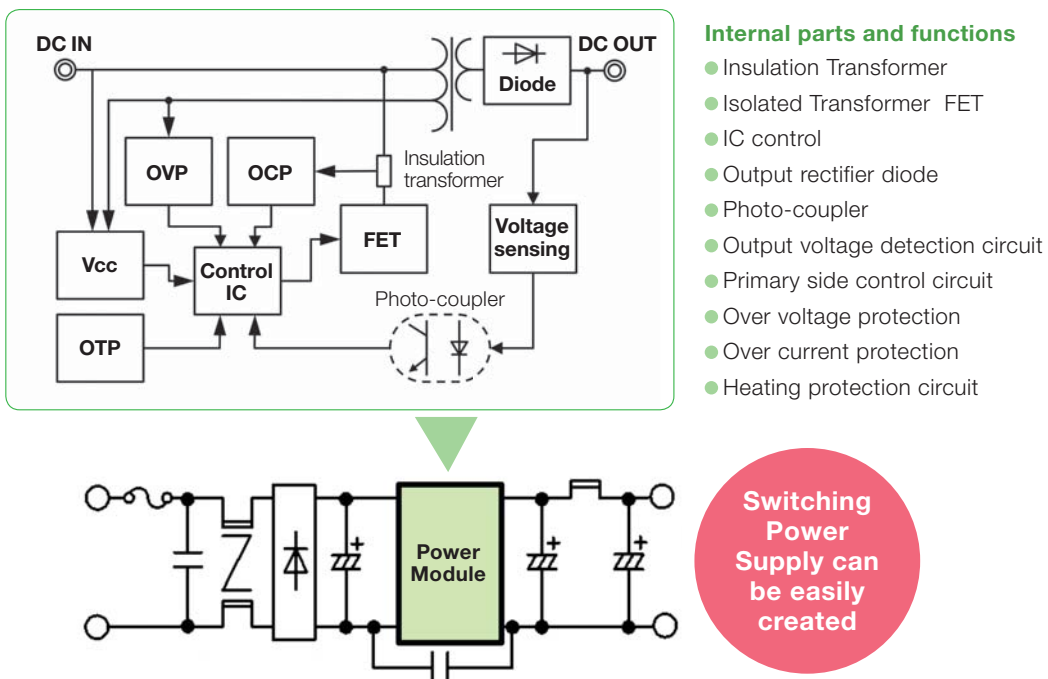
Series	SPM Series	EPM Series	MPM Series	BPM Series
Class	4W	15W	25W	40W
Product				

Explanation of the Outline

Outline

Tamura's power modules are energy-saving switching power supply modules with switching transformer, IC control, circuit control and a built-in (FET) switching component.

By attaching an external input noise filter, input rectifier diode, input / output smoothing capacitor a high-efficiency and high performance switching power supply with low standby power can easily be created with the Power supply module.



Applications

Industrial equipment, Information processing equipment, AV equipment, Consumer electronics, Standby power, Small power, etc.

Features

- Capable of high efficiency from quasi resonant operation
- Low standby power consumption because of the combination of behavior and burst frequency reduction
- Corresponding world wide input and PFC output voltage
- Reinforced insulation between primary and secondary
- Capable of low noise for Tamura's unique structure
- Correspondence of various safety standard (Information equipment, AV equipment, Industrial equipment, Home appliance)
- Various built-in protection function (Over-current protection, Over-voltage protection, Overheat protection)

List of Products , SPM Series

SPM Series

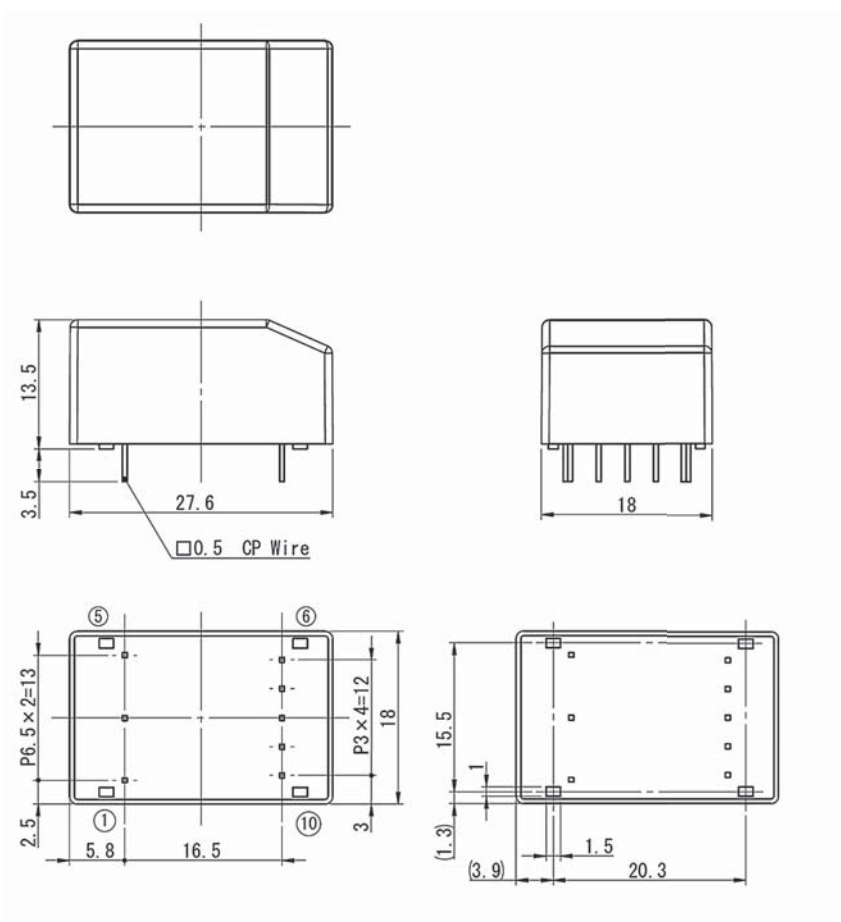


RoHS

Item	Model			
	SPM0307SJ	SPM0507SJ	SPM1203SJ	SPM1502SJ
Rated Output Voltage / Rated Load	3.3V / 0.7A	5V / 0.66A	12V / 0.28A	15V / 0.22A
Output voltage tolerance (10~100% Load)	±10%	±7.5%	±6%	+5% / -6%
Output voltage tolerance (0~10% Load)	+15% / -10%	+12% / -10%	±10%	±10%
Input Voltage Range	DC110 - 390V	DC110 - 420V		
Efficiency (DC140V, Rated load, 25°C)	70%(typ)	76%(typ)	80%(typ)	82%(typ)
No-load power (DC140V, 25°C)	15mW(typ)	17mW(typ)	17mW(typ)	20mW(typ)
Ripple	150mVp-p	150mVp-p	250mVp-p	400mVp-p
Ripple & Noise	200mVp-p	200mVp-p	300mVp-p	500mVp-p
Protection	Over Current Protection	Auto recovery		
	Over Temperature Protection	Auto recovery		
Insulation	Insulation Voltage	AC3750V 1min Cut off current = 2mA		
	Insulation Resistance	DC500V 100MΩmin		
Environment	Ambient Temperature (Operating)	-20 ~ +95°C (+75 ~ +95°C : stand for derating)		
	Ambient Humidity (Operating)	20 ~ 95%RH (Nil condensation)		
	Ambient Temperature (Storage)	-25 ~ +100°C		
	Ambient Humidity (Storage)	5 ~ 95%RH (Nil condensation)		
	Vibration	10 ~ 55Hz 1.5mmp-p 120min X,Y,Z direction each once		
	Shock	490m/s ² 11ms X,Y,Z direction each once		

External Dimensions / Pin assignment

External Dimensions



Note: The dimensional tolerance without directions is $\pm 0.5\text{mm}$.

Pin assignment

Primary side			Secondary side		
Pin No.	Name	Description	Pin No.	Name	Description
1	Vin(-)	Input (-)	6	N.C.	N.C.(Unable to connect to other circuits.)
2	-	No pin	7	N.C.	N.C.(Unable to connect to other circuits.)
3	Drain	Noise adjustment	8	W1	Secondary winding terminal
4	-	No pin	9	Vo	Output (+)
5	Vin(+)	Input (+)	10	GND	Output (-)

List of Products , EPM Series

EPM Series

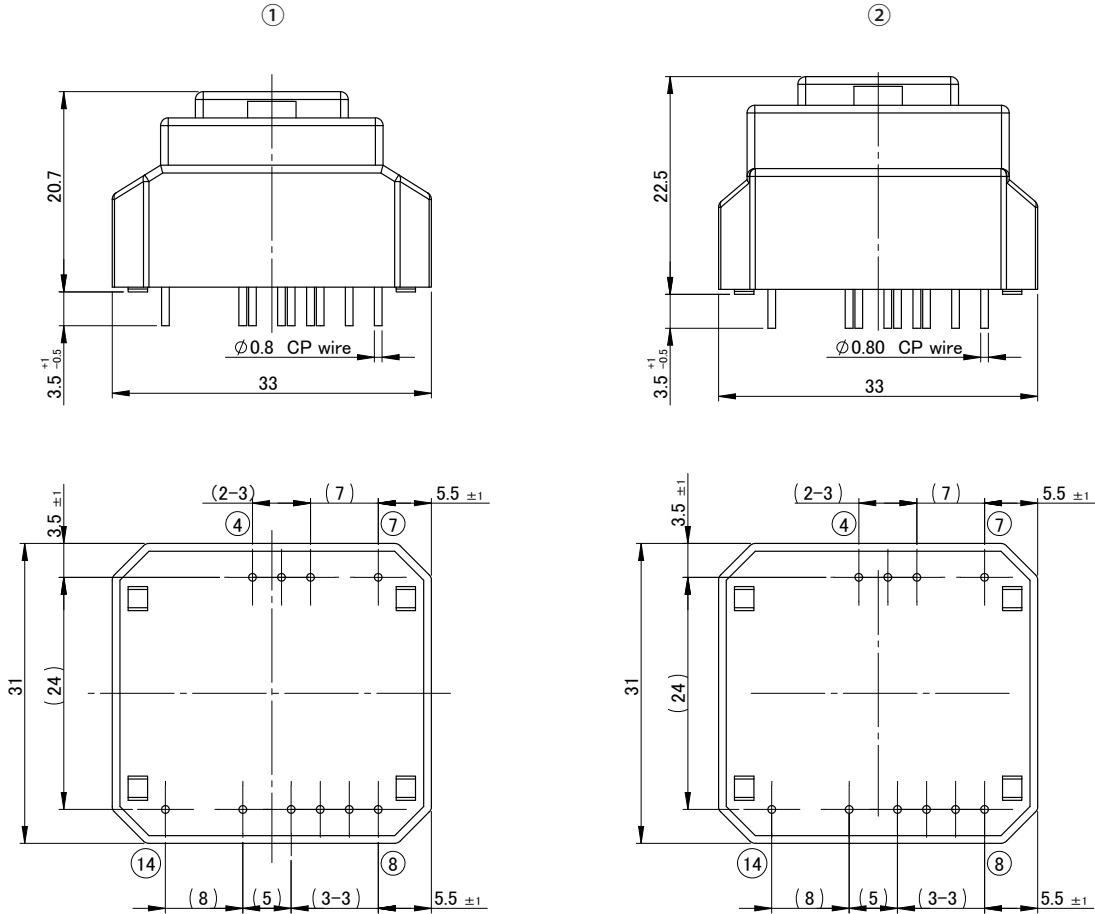


RoHS

Item	Model						
	EPM0310SJ	EPM0510SJ	EPM1205SJ	EPM1210SJ	EPM1505SJ	EPM1510SJ	EPM2405SJ
External dimensions	①	①	①	②	①	②	②
Rated Output Voltage / Rated Load	3.3V / 1.0A	5V / 1.0A	12V / 0.5A	12V / 1.0A	15V / 0.5A	15V / 1.0A	24V / 0.5A
Output voltage tolerance	±5%						
Input Voltage Range	DC110 - 450V						
Efficiency (DC140V, Rated load, 25°C)	78%(typ)	80%(typ)	85%(typ)	88%(typ)	88%(typ)	90%(typ)	90%(typ)
No-load power (DC140V, 25°C)	15mW(typ)	17mW(typ)	19mW(typ)	23mW(typ)	25mW(typ)	23mW(typ)	28mW(typ)
Ripple	60mVp-p	60mVp-p	120mVp-p	120mVp-p	150mVp-p	150mVp-p	240mVp-p
Ripple & Noise	100mVp-p	100mVp-p	150mVp-p	150mVp-p	200mVp-p	200mVp-p	300mVp-p
Protection	Over Current Protection	Auto recovery					
	Over Voltage Protection	Lutch off					
	Over Temperature Protection	Lutch off					
Insulation	Insulation Voltage	AC3750V 1min Cut off current = 2mA					
	Insulation Resistance	DC500V 100MΩmin					
Environment	Ambient Temperature (Operating)	-20 ~ +80°C (+60 ~ +80°C : stand for derating)					
	Ambient Humidity (Operating)	20 ~ 95%RH (Nil condensation)					
	Ambient Temperature (Storage)	-25 ~ +85°C					
	Ambient Humidity (Storage)	5 ~ 95%RH (Nil condensation)					
	Vibration	10 ~ 55Hz 1.5mmp-p 120min X,Y,Z direction each once					
	Shock	490m/s ² 11ms X,Y,Z direction each once					

External Dimensions / Pin assignment

External Dimensions



Note: The dimensional tolerance without directions is $\pm 0.5\text{mm}$.

Pin assignment

Primary side			Secondary side		
Pin No.	Name	Description	Pin No.	Name	Description
8	N.C.	N.C.(Unable to connect to other circuits.)	1	-	No pin
9	VccW	Control pin	2	-	No pin
10	Vin(-)	Input (-)	3	-	No pin
11	Vcc	Start-up time adjustment	4	SecW	Secondary winding terminal
12	Vin(+)	Input (+)	5	Vo	Output (+)
13	-	No pin	6	N.C.	N.C.(Unable to connect to other circuits.)
14	Drain	Noise adjustment	7	GND	Output (-)

List of Products , MPM Series

MPM Series



RoHS

Item	Model					
	MPM0527SJ	MPM1220SJ	MPM1517SJ	MPM2411SJ	MPM3608SJ	MPM4806SJ
Rated Output Voltage / Rated Load	5.0V / 2.7A	12V / 2.0A	15V / 1.7A	24V / 1.1A	36V / 0.75A	48V / 0.58A
Output voltage tolerance	±5%					
Input Voltage Range	DC100 ~ 420V					
Efficiency (DC140V, Rated load, 25°C)	82%(typ)	86%(typ)	86%(typ)	89%(typ)	90%(typ)	90%(typ)
No-load power (DC140V, 25°C)	25mW(typ)	30mW(typ)	29mW(typ)	30mW(typ)	38mW(typ)	45mW(typ)
Ripple	60mVp-p	120mVp-p	150mVp-p	240mVp-p	360mVp-p	480mVp-p
Ripple & Noise	100mVp-p	150mVp-p	180mVp-p	300mVp-p	400mVp-p	570mVp-p
Protection	Over Current Protection	Auto recovery				
	Over Voltage Protection	Lutch off				
	Over Temperature Protection	Lutch off				
Insulation	Insulation Voltage	AC3750V 1min Cut off current = 2mA				
	Insulation Resistance	DC500V 100MΩmin				
Environment	Ambient Temperature (Operating)	-20 ~ +80°C (+50 ~ +80°C: stand for derating)				
	Ambient Humidity (Operating)	20 ~ 95% RH (Nil condensation)				
	Ambient Temperature (Storage)	-25 ~ +85°C				
	Ambient Humidity (Storage)	5 ~ 95% RH (Nil condensation)				
	Vibration	10 ~ 55Hz 1.5mmp-p 120min X,Y,Z direction each once				
	Shock	490m/s ² 11ms X,Y,Z direction each once				

List of Products , BPM Series

BPM Series

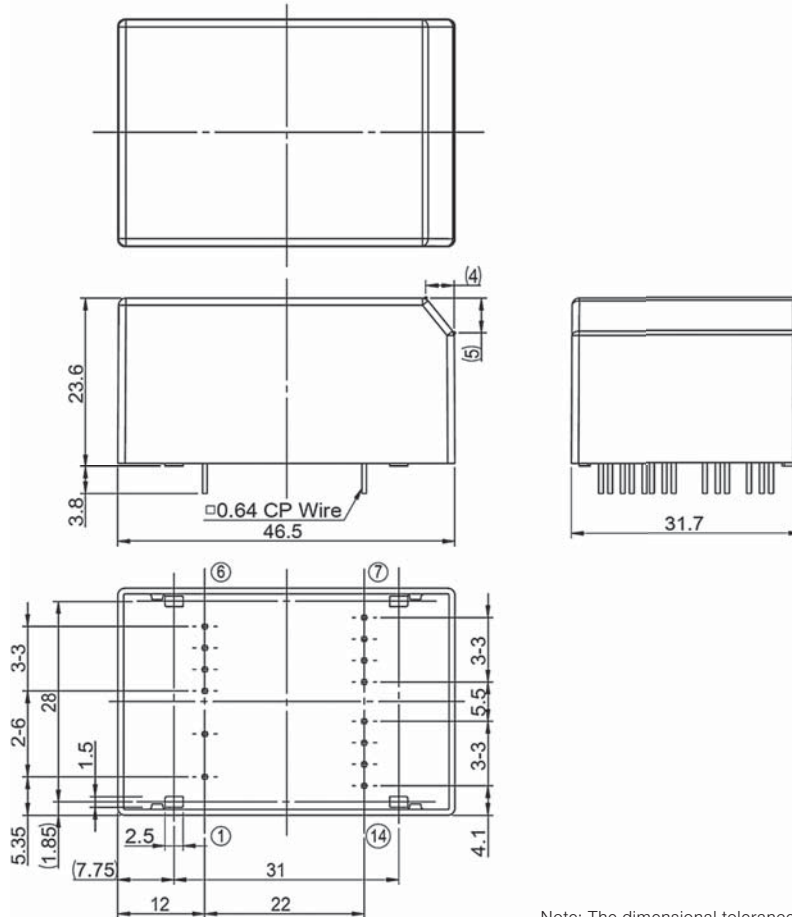


RoHS

Item	Model			
	BPM0580SJ	BPM1234SJ	BPM1527SJ	BPM2417SJ
Rated Output Voltage / Rated Load	5V / 8.0A	12V / 3.4A	15V / 2.7A	24V / 1.7A
Output voltage tolerance	±5%			
Input Voltage Range	DC100 ~ 420V			
Efficiency (DC140V, Rated load, 25°C)	87%(typ)	91%(typ)	93%(typ)	90%(typ)
No-load power (DC140V, 25°C)	25mW(typ)	25mW(typ)	25mW(typ)	25mW(typ)
Ripple	60mVp-p	120mVp-p	120mVp-p	240mVp-p
Ripple & Noise	100mVp-p	150mVp-p	150mVp-p	300mVp-p
Protection	Over Current Protection	Auto recovery		
	Over Voltage Protection	Lutch off		
	Over Temperature Protection	Lutch off		
Insulation	Insulation Voltage	AC3000V 1min Cut off current = 2mA	AC3750V 1min Cut off current = 2mA	
	Insulation Resistance	DC500V 100MΩmin		
Environment	Ambient Temperature (Operating)	-20 ~ +80°C (+50 ~ +80°C : stand for derating)		
	Ambient Humidity (Operating)	20 ~ 95%RH (Nil condensation)		
	Ambient Temperature (Storage)	-25 ~ +85°C		
	Ambient Humidity (Storage)	5 ~ 95%RH (Nil condensation)		
	Vibration	10 ~ 55Hz 1.5mmp-p 120min X,Y,Z direction each once		
	Shock	490m/s ² 11ms X,Y,Z direction each once		

External Dimensions / Pin assignment

External Dimensions



Note: The dimensional tolerance without directions is ± 0.5 mm.

Pin assignment

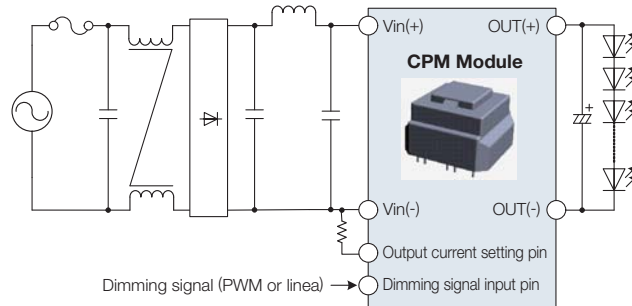
Primary side			Secondary side		
Pin No.	Name	Description	Pin No.	Name	Description
1	Vin(+)	Input (+)	7	REF	Output voltage adjustment
2	Drain	Noise adjustment	8	RC(-)	Output voltage detection (-)
3	Vin(-)	Input (-)	9	GND	Output (-)
4	Vcc	Start-up time adjustment	10	GND	Output (-)
5	VccW	Control pin	11	GND	Output (-)
6	N.C.	N.C.(Unable to connect to other circuits.)	12	Vo	Output (+)
			13	Vo	Output (+)
			14	RC(+)	Output voltage detection (+)

List of Products , CPM series / Constant Current type , LED driver

CPM Series



RoHS

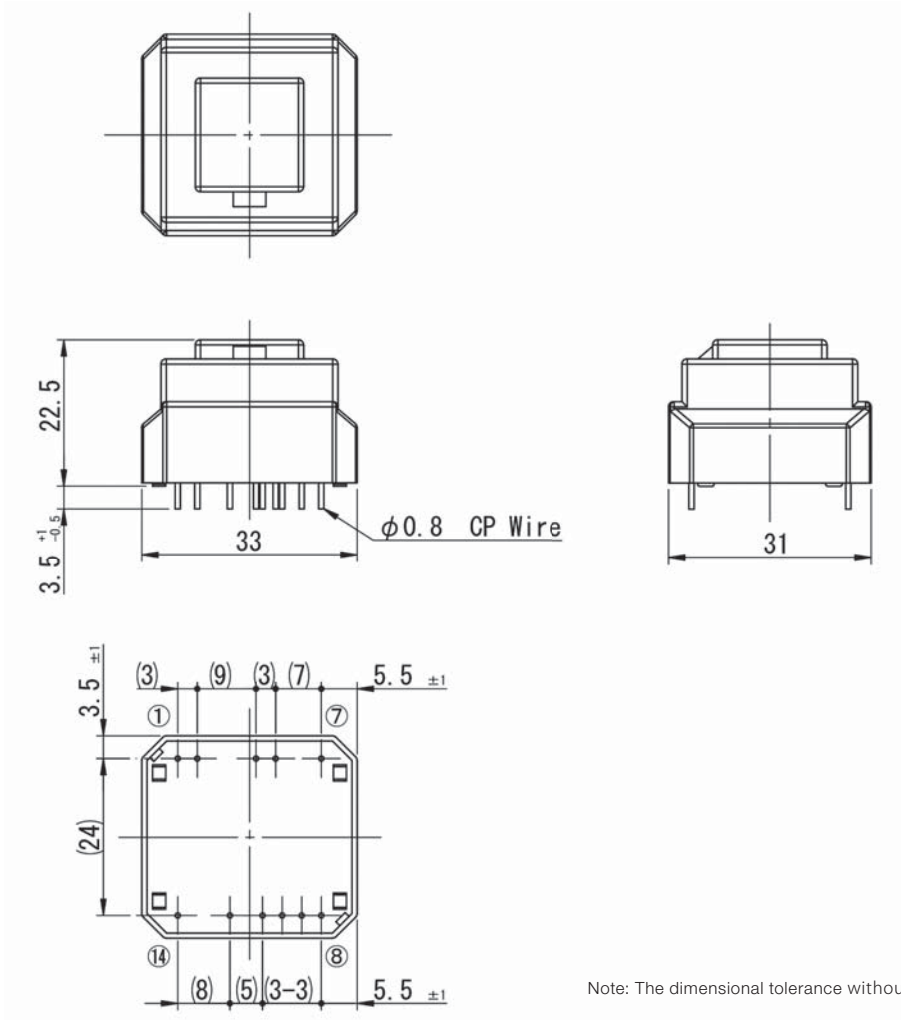


Item		Model	
		CPM3417RA	CPM6018RA
Output 1	Output voltage range	17V ~ 34V	17V ~ 34V
	Output current variable range	400 ~ 500mA	300 ~ 380mA
Max output power		17W	18W
Input voltage range		AC90 ~ 264V/47 ~ 63Hz	
Efficiency (AC100V,Max output power , 25°C)		85% Typ	88% Typ
Efficiency (AC100V,Max output power , 25°C)		84% Typ	87% Typ
Power factor (AC100V/50Hz, Max output power)		0.99	0.99
Power factor (AC240V/50Hz, Max output power)		0.91	0.91
Dimming signal		PWM dimming ^{*1} /Linear dimming	
Dimming range		5 ~ 100%	
Protection	Over Current Protection	Auto recovery	
	Over Voltage Protection	Auto recovery	
	Over Temperature Protection	Auto recovery	
Insulation	Insulation Voltage	AC3000V 1min Cut off current = 2mA	
	Insulation Resistance	DC500V 100MΩmin	
Environment	Ambient Temperature (Operating)	-20 ~ +70°C (+50 ~ +70°C : Stand for derating)	
	Ambient Humidity (Operating)	20 ~ 95% RH (Nil condensation)	
	Ambient Temperature (Storage)	-25 ~ +85°C	
	Ambient Humidity (Storage)	5 ~ 95% RH (Nil condensation)	
	Vibration	10 ~ 55Hz 1.5mmp-p 120min cycle X,Y,Z direction each once	
	Shock	490m/s ² 11ms X,Y,Z direction each once	

^{*1} External circuit is required for PWM dimming.

External Dimensions / Pin assignment

External Dimensions



Note: The dimensional tolerance without directions is ± 0.5 mm.

Pin assignment

Primary side			Secondary side		
Pin No.	Name	Description	Pin No.	Name	Description
1	OVP(A)	OVP detection (A)	3	-	No pin
2	OVP(K)	OVP detection	4	-	No pin
8	DIM	Dimming signal input	5	Io(-)	Output (-)
9	VccW	Control pin	6	Io(+)	Output (+)
10	Vin(-)	Input (-)	7	SecW	Secondary winding terminal
11	Iset	Constant current setting			
12	Vin(+)	Input (+)			
13	-	No pin			
14	Drain	Noise adjustment			

List of Products , CPM series / Constant Current type , LED driver

CPM Series

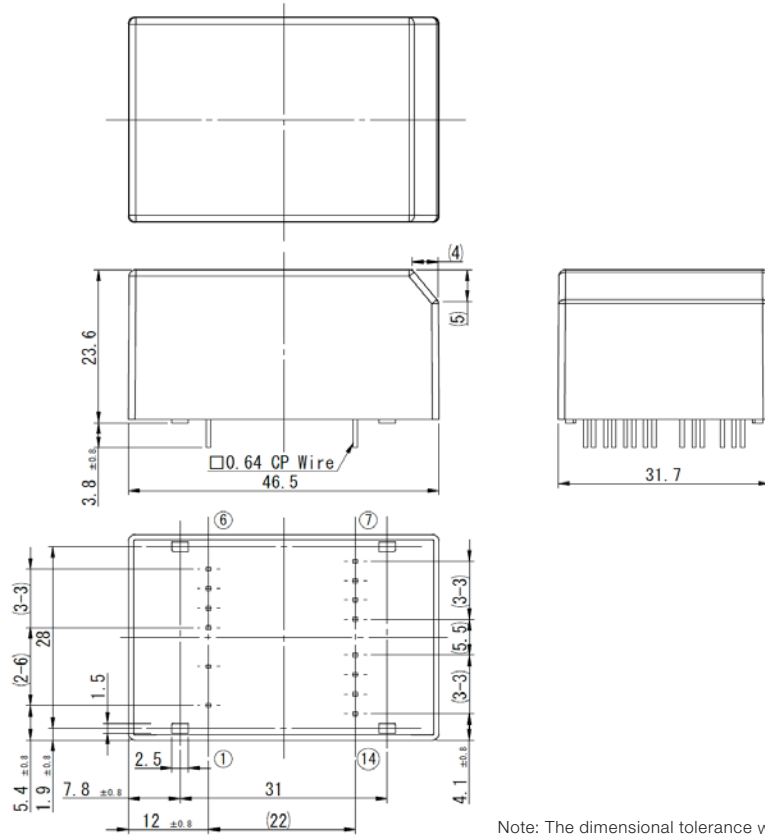
RoHS

Item		Model			
		CPM340534DRA	CPM3434RA	CPM600540RA	CPM6040RA
Output 1	Output voltage range	17V ~ 34V	17V ~ 34V	30V ~ 60V	30V ~ 60V
	Output current variable range	800 ~ 1000mA	800 ~ 1000mA	560 ~ 700mA	560 ~ 700mA
Output 2	Output voltage	5V	-	5V	-
	Output current	100mA Max	-	100mA Max	-
Max output power		34W	34W	40W	40W
Input voltage range		AC90 ~ 264V/47 ~ 63Hz			
Efficiency (AC100V,Max output power , 25°C)		87% typ	87% typ	89% typ	89% typ
Efficiency (AC100V,Max output power , 25°C)		88% typ	88% typ	89% typ	89% typ
Power factor (AC100V/50Hz, Max output power)		0.99	0.99	0.99	0.99
Power factor (AC240V/50Hz, Max output power)		0.95	0.95	0.95	0.95
Dimming signal		PWM dimming *1 /Linear dimming			
Dimming range		5 ~ 100%			
Protection	Over Current Protection	Auto recovery			
	Over Voltage Protection	Auto recovery			
	Over Temperature Protection	Auto recovery			
Insulation	Insulation Voltage	AC3000V 1min Cut off current = 2mA			
	Insulation Resistance	DC500V 100MΩmin			
Environment	Ambient Temperature (Operating)	-20 ~ +70°C (+50 ~ +70°C : Stand for derating)			
	Ambient Humidity (Operating)	20 ~ 95%RH (Nil condensation)			
	Ambient Temperature (Storage)	-25 ~ +85°C			
	Ambient Humidity (Storage)	5 ~ 95%RH (Nil condensation)			
	Vibration	10 ~ 55Hz 1.5mmp-p 120min cycle X,Y,Z direction each once			
	Shock	490m/s ² 11ms X,Y,Z direction each once			

*1 External circuit is required for PWM dimming.

External Dimensions / Pin assignment

External Dimensions



Note: The dimensional tolerance without directions is $\pm 0.5\text{mm}$.

Pin assignment (CPM340534DRA/CPM600540RA)

Primary side			Secondary side		
Pin No.	Name	Description	Pin No.	Name	Description
1	Vin(+)	Input (+)	7	Vcc	Auxiliary voltage
2	Drain	N.C.(Unable to connect to other circuits.)	8	GND2	Output (-)_5V
3	Vin(-)	Input (-)	9	Vo2	Output (+)_5V
4	Iset	Constant current setting	10	N.C.	N.C.(Unable to connect to other circuits.)
5	DIM	Dimming signal input	11	GND1	Output (-)_LED
6	VccW	Control pin	12	N.C.	N.C.(Unable to connect to other circuits.)
			13	N.C.	N.C.(Unable to connect to other circuits.)
			14	Vo1	Output (+)_LED

Pin assignment (CPM3434RA/CPM6040RA)

Primary side			Secondary side		
Pin No.	Name	Description	Pin No.	Name	Description
1	Vin(+)	Input (+)	7	N.C.	N.C.(Unable to connect to other circuits.)
2	Drain	N.C.(Unable to connect to other circuits.)	8	N.C.	N.C.(Unable to connect to other circuits.)
3	Vin(-)	Input (-)	9	N.C.	N.C.(Unable to connect to other circuits.)
4	Iset	Constant current setting	10	N.C.	N.C.(Unable to connect to other circuits.)
5	DIM	Dimming signal input	11	GND	Output (-)
6	VccW	Control pin	12	N.C.	N.C.(Unable to connect to other circuits.)
			13	N.C.	N.C.(Unable to connect to other circuits.)
			14	Vo	Output (+)

Multi-output lineup

Please contact us for detailed specifications.

Item	Model			
	EPM120806D	EPM141626DA	EPM071217T	
External dimensions	Refer to EPM series ② (Pin assignment is different)	Refer to EPM series ② (Pin assignment is different)	Refer to EPM series ② (Pin assignment is different)	
Rated Output Voltage/ Rated Load	12V/500mA 8V/50mA	13.5V/300mA 16V/120mA	Basic insulation (Secondary) 7.2V/1000mA Basic insulation (Secondary) 12V/180mA Non-insulated (Primary) 17V/200mA	
Output voltage tolerance	12V±10% 8V±15% (Requires external dummy resistors)	13.5V±10% 16V+10% -5% (Requires external dummy resistors)	7.2V±5% 12V : 10.2V ~ 14.4V 17V : 15.5V ~ 23.4V (Requires external dummy resistors)	
Load current range	12V : 0 ~ 500mA 8V : 0 ~ 50mA	13.5V : 22 ~ 1840mA 16V : 0 ~ 120mA	7.2V : 30 ~ 1000mA 12V : 0 ~ 180mA 17V : 5 ~ 200mA	
Input Voltage Range	DC110 ~ 373V	DC110 ~ 390V	DC100 ~ 373V	
Efficiency (DC140V, Rated load, 25°C)	75% or more	75% or more	80% or more	
No-load power (DC140V, 25°C)	0.15W or less	0.8W or less (13.5V : 22mA, 16V : 0mA)	1W or less	
Ripple	120mVp-p or less	100mVp-p or less	150mVp-p or less	
Ripple & Noise	150mVp-p or less	150mVp-p or less		
Protection	Over Current Protection	Auto recovery	Auto recovery	Auto recovery
	Over Voltage Protection	Lutch off	Auto recovery	Lutch off
	Over Temperature Protection	Lutch off	Auto recovery	Lutch off
Insulation	Insulation Voltage	AC3000V 1min Cut off current = 2mA	AC1500V 1min Cut off current = 2mA	AC1500V 1min Cut off current = 2mA
	Insulation Resistance	DC500V 100MΩmin		
Environment	Ambient Temperature (Operating)	-20 ~ +80°C (+70 ~ +80°C :Stand for derating)	-30 ~ +80°C	-20 ~ +60°C
	Ambient Humidity (Operating)	20 ~ 95% RH (Nil condensation)		
	Ambient Temperature (Storage)	-25 ~ +85°C	-30 ~ +85°C	-25 ~ +85°C
	Ambient Humidity (Storage)	5 ~ 95% RH (Nil condensation)		
	Vibration	10 ~ 55Hz 1.5mmp-p 120min X,Y,Z direction each once		
	Shock	490m/s ² 11ms X,Y,Z direction each once		

Multi-output lineup

Please contact us for detailed specifications.

Item	Model		
	MPM141607T	BPM141605T	
External dimensions	Refer to MPM series (Pin assignment is different)	Refer to BPM series (Pin assignment is different)	
Rated Output Voltage/ Rated Load	13.5V/1000mA 16V/600mA 7V/300mA	13.5V/2600mA 16V/150mA 5V/150mA	
Output voltage tolerance	13.5V+10% -8% 16V+10% -5% 7V±5% (Requires external dummy resistors)	13.5V±10% 16V+10% -5% 5V±5% (Requires external dummy resistors)	
Load current range	13.5V : 0 ~ 2200mA 16V : 10 ~ 600mA 7V : 20mA ~ 300mA	13.5V : 0 ~ 3400mA 16V : 0~250mA 5V : 0 ~ 150mA	
Input Voltage Range	DC240 ~ 373V	DC110 ~ 373V	
Efficiency (DC140V, Rated load, 25°C)	85% or more	80% or more	
No-load power (DC140V, 25°C)	1W or less	1W or less	
Ripple	150mVp-p or less	100mVp-p or less	
Ripple & Noise		150mVp-p or less	
Protection	Over Current Protection	Auto recovery	Auto recovery
	Over Voltage Protection	Auto recovery	Lutch off
	Over Temperature Protection	Auto recovery	Auto recovery
Insulation	Insulation Voltage	AC1500V 1min Cut off current = 1mA	AC1500V 1min Cut off current = 1mA
	Insulation Resistance	DC500V 100MΩmin	
Environment	Ambient Temperature (Operating)	-30 ~ +65°C	-25 ~ +65°C (+50 ~ +65°C : Stand for derating)
	Ambient Humidity (Operating)	20 ~ 95% RH (Nil condensation)	
	Ambient Temperature (Storage)	-30 ~ +85°C	-30 ~ +85°C
	Ambient Humidity (Storage)	5 ~ 95% RH (Nil condensation)	
	Vibration	10 ~ 55Hz 1.5mmp-p 120min X,Y,Z direction each once	
	Shock	490m/s ² 11ms X,Y,Z direction each once	

Important notice

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 - Use that involves exposure to direct sunlight, outdoor exposure, or dusty conditions
 - Use in locations where corrosive gases such as salt air, C12, H2S, NH3, SO2, or NO2, are present
 - Use in environments with strong static electricity or electromagnetic radiation
 - Use that involves placing inflammable material next to the product
 - Use of this product either sealed with a resin filling or coated with resin
 - Use of water or a water soluble detergent for flux cleaning
 - Use in locations where condensation is liable to occur
- This product is not designed to resist radiation.
- This product is not designed to be connected in series or parallel. Do not operate this product in a series, parallel, or N+1 redundant configuration.
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