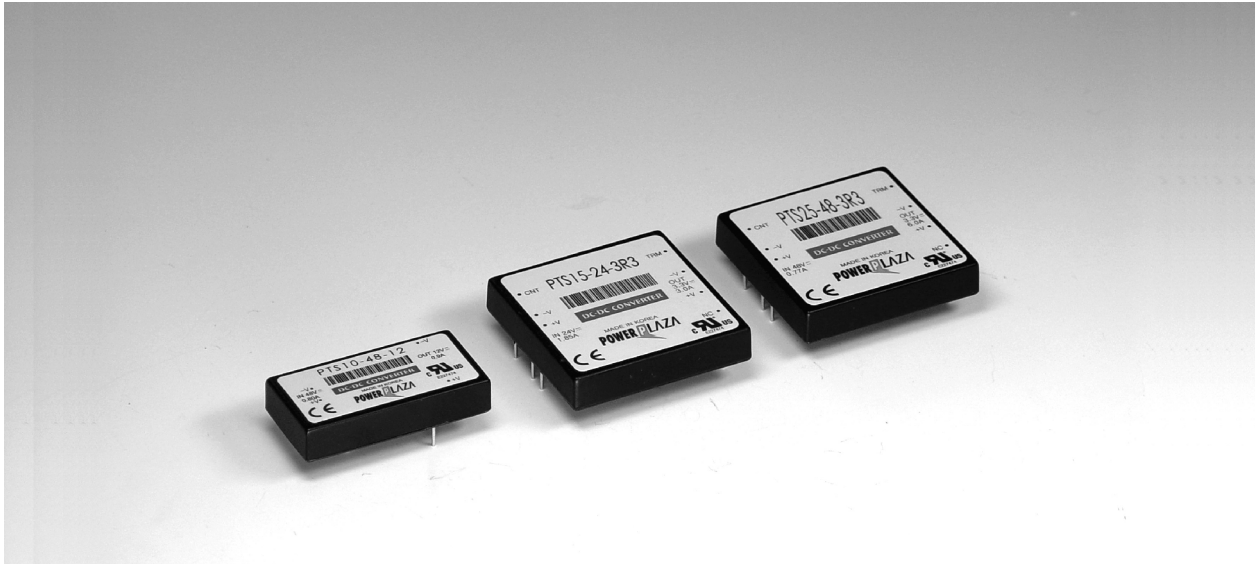


**DC-DC CONVERTER (PT series)**



**Ordering Information**

**PT**   **15 - 48 - 522**

Series name							
S : single							
D : dual							
Non : triple							
							Output voltage
							Input voltage
							Output power


<b>INPUT</b>	DC 10V - 36V, 20V - 72V : 10W, 15W DC 18V - 36V, 36V - 72V : 25W
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<b>OUTPUT</b>	3.3V, 5V, 12V, 15V, ±5V, ±12V, ±15V, 5V/±12V, 5V/±15V
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**Features**

- RoHS directive compliance
- Single, dual and triple output
- Encapsulated small and compact size (6 Sided shielding)
- High quality, reliability and efficiency
- Over voltage protection (O.V.P.)
- Short circuit protection
- Remote on/off control
- Output voltage variation (TRM)
- Surface mounting technology
- Isolated output
- Approved by **UL** (UL 60950, CSA C 22.2 NO. 60950) / **CE** (EN 60950) - through TÜV (single)
- 3 years warranty

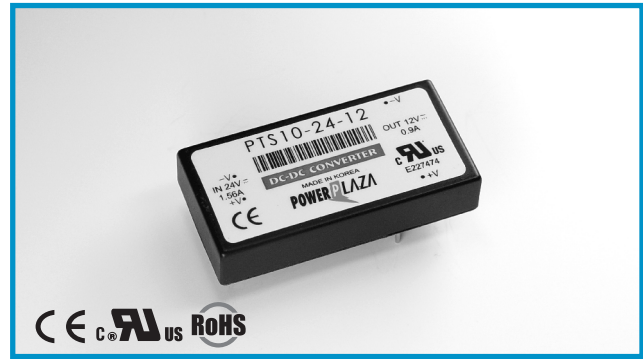
## PT SERIES

Series Name	Input Voltage	Output1	Output2	Output3	Model	Page
<b>PT 10</b> 	24V (10-36) 48V (20-72)	3.3V / 2.4A 5.0V / 2.0A 12.0V / 0.9A 15.0V / 0.7A			<b>PTS 10</b>	<b>31</b>
	24V (10-36) 48V (20-72)	5.0V / 1.00A 12.0V / 0.45A 15.0V / 0.35A	-5.0V / 1.00A -12.0 / 0.45A -15.0 / 0.35A		<b>PTD 10</b>	
<b>PT 15</b> 	24V (10-36) 48V (20-72)	3.3V / 4.00A 5.0V / 3.00A 12.0V / 1.25A 15.0V / 1.00A			<b>PTS 15</b>	<b>33</b>
	24V (10-36) 48V (20-72)	5.0V / 1.50A 12.0V / 0.625A 15.0V / 0.50A	-5.0V / 1.50A -12.0V / 0.625A -15.0V / 0.50A		<b>PTD 15</b>	
	24V (10-36) 48V (20-72)	3.3V / 1.5A 5.0V / 1.5A 3.3V / 1.5A 5.0V / 1.5A	+12.0V / 0.31A +12.0V / 0.31A +15.0V / 0.25A +15.0V / 0.25A	-12.0V / 0.31A -12.0V / 0.31A -15.0V / 0.25A -15.0V / 0.25A	<b>PT 15</b>	
<b>PT 25</b> 	24V (18-36) 48V (36-72)	3.3V / 6.0A 5.0V / 5.0A 12.0V / 2.0A 15.0V / 1.6A			<b>PTS 25</b>	<b>35</b>
	24V (18-36) 48V (36-72)	5.0V / 2.5A 12.0V / 1.0A 15.0V / 0.8A	-5.0V / 2.5A -12.0V / 1.0A -15.0V / 0.8A		<b>PTD 25</b>	
	24V (18-36) 48V (36-72)	3.3V / 3.5A 5.0V / 3.5A 3.3V / 3.5A 5.0V / 3.5A	+12.0V / 0.35A +12.0V / 0.35A +15.0V / 0.28A +15.0V / 0.28A	-12.0V / 0.35A -12.0V / 0.35A -15.0V / 0.28A -15.0V / 0.28A	<b>PT 25</b>	

# PT 10

## PT 10 Watt Series DC/DC Converters

**Total power** 10 Watts  
**Input voltages** 24V, 48V  
**#of outputs** Single, Dual Output



### SPECIAL FEATURES

- CE(LVD), UL marking
- Industrial standard pin layout
- 300KHz fixed frequency
- Wide 4:1 input range
- Isolated output
- Small, compact size 2.0"×1.0"×0.40"
- Surface mount internal construction
- Six sided EMI shielding
- Low output ripple & noise
- Current mode control
- Low start up current
- 3 years warranty

### ENVIRONMENTAL

- Operating temperature range..... -20 °C ~71 °C
- Option, see Note 1 ..... -40 °C ~85 °C
- Storage temperature range..... -40 °C ~105 °C
- Operating humidity (non condensing)..... 20%~90%RH
- Storage humidity (non condensing)..... 10%~95%RH
- Cooling method ..... Convection
- EMI / RFI..... Six-sided continuous shield
- Case material ..... Zn
- MTBF (MIL-HDBK-217F)..... 5.8×10<sup>5</sup> hrs
- Safety (single output)
  - └ UL (UL 60950, CSA C22.2 NO.60950) : E227474/
  - └ CE (EN 60950)through TÜV

### ELECTRICAL SPECIFICATIONS

<b>INPUT</b>	<ul style="list-style-type: none"> <li>• Input range ..... DC 10V - 36V (PT 10-24), DC20V - 72V (PT 10-48)</li> <li>• Efficiency ..... 78 - 85% typ.</li> </ul>
<b>OUTPUT</b>	<ul style="list-style-type: none"> <li>• Voltage tolerance ..... ±2% (single and uncomplementary dual)                      ±3% (complementary dual)</li> <li>• Line regulation ..... ±0.5% @ single                      ±1% @ dual</li> <li>• Load regulation ..... ±1% @ single                      ±2.5% @ dual (minimum load 10%)</li> <li>• Ripple and Noise, pk-pk ..... Bandwidth : 20MHz                      Magnitude : 1% Vout nom</li> </ul>
<b>PROTECTION CIRCUIT</b>	<ul style="list-style-type: none"> <li>• Short circuit protection ..... Current limited output (note2)</li> <li>• Over voltage protection ..... Zener clamp</li> </ul>
<b>ELECTRICALLY ISOLATED</b>	<ul style="list-style-type: none"> <li>• Isolation ..... Input-output, input-case, output-case / DC 500V, 100Mohms</li> <li>• High pot ..... Input-output, input-case, output-case / AC 500V, 1minute</li> </ul>

**NOTE** 1. As a factory added option, the all model can be operated down to -40°C, the suffix 'M' should be added to the model number when ordering. ex) PTS10-48-5M  
 2. Long term continuous operation into a short circuit will compromise the reliability of the unit.

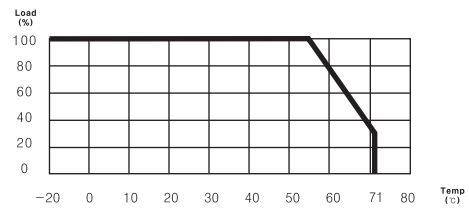
## Ordering Information

Input	Output1	Output2	Maximum Power	Ripple&Noise max	Efficiency Typ.	Model Number
10 – 36V	3.3V@2.40A		7.92W	75mVp-p	79%	PTS10-24-3R3
10 – 36V	5V@2.00A		10.0W	75mVp-p	82%	PTS10-24-5
10 – 36V	12V@0.90A		10.8W	120mVp-p	83%	PTS10-24-12
10 – 36V	15V@0.70A		10.5W	150mVp-p	84%	PTS10-24-15
10 – 36V	5V@1.00A	-5V@1.00A	10.0W	100/100mVp-p	80%	PTD10-24-55
10 – 36V	5V@1.50A	-5V@0.50A	10.0W	100/100mVp-p	78%	PTD10-24-55A
10 – 36V	12V@0.45A	-12V@0.45A	10.8W	120/120mVp-p	83%	PTD10-24-1212
10 – 36V	15V@0.35A	-15V@0.35A	10.5W	150/150mVp-p	83%	PTD10-24-1515
20 – 72V	3.3V@2.40A		7.92W	75mVp-p	78%	PTS10-48-3R3
20 – 72V	5V@2.00A		10.0W	75mVp-p	81%	PTS10-48-5
20 – 72V	12V@0.90A		10.8W	120mVp-p	84%	PTS10-48-12
20 – 72V	15V@0.70A		10.5W	150mVp-p	85%	PTS10-48-15
20 – 72V	5V@1.00A	-5V@1.00A	10.0W	100/100mVp-p	81%	PTD10-48-55
20 – 72V	5V@1.50A	-5V@0.50A	10.0W	100/100mVp-p	81%	PTD10-48-55A
20 – 72V	12V@0.45A	-12V@0.45A	10.8W	120/120mVp-p	83%	PTD10-48-1212
20 – 72V	15V@0.35A	-15V@0.35A	10.5W	150/150mVp-p	83%	PTD10-48-1515

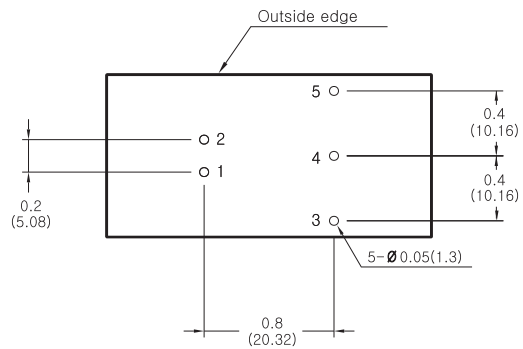
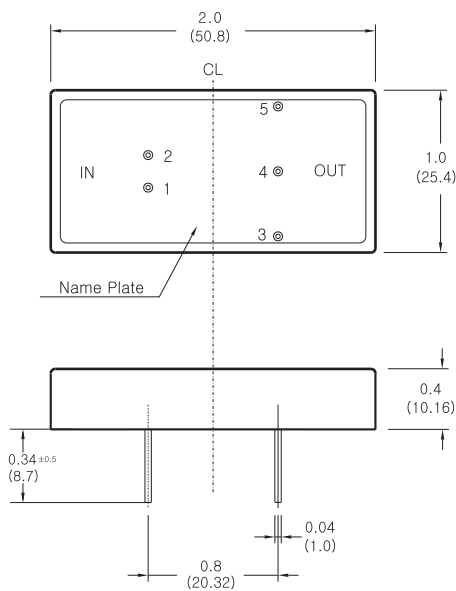
## Pin assignments

Single Output	Dual Output
1. +Vin	1. +Vin
2. -Vin	2. -Vin
3. +Vout	3. Output1
4. No pin	4. COM
5. -Vout	5. Output2

## Derating curve



## Dimensions



※ Mounting hole top view

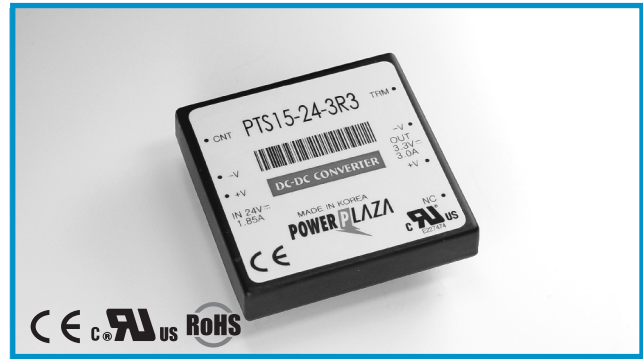
## NOTES

1. All dimensions are in inches and(mm).
2. Weight : 40g or less

# PT 15

## PT 15 Watt Series DC/DC Converters

**Total power** 15 Watts  
**Input voltages** 24V, 48V  
**#of outputs** Single, Dual, Triple Output



### SPECIAL FEATURES

- CE(LVD), UL marking
- High efficiency
- Industrial standard pin out
- 250KHz fixed frequency
- Wide 4:1 input range
- Isolated output
- Small, compact size 2.0"×2.0"×0.40"
- Surface mount internal construction
- Six sided EMI shielding
- Low output ripple & noise
- Remote on / off control
- Output voltage variation (TRM)
- Over voltage protection (O.V.P.)
- Current mode control
- 3 years warranty

### ENVIRONMENTAL

- Operating temperature range..... -20℃~71℃
- Option, see Note 1 ..... -40℃~85℃
- Storage temperature range ..... -40℃~105℃
- Operating humidity (non condensing)..... 20%~90%RH
- Storage humidity (non condensing)..... 10%~95%RH
- Cooling method ..... Convection
- EMI / RFI..... Six-sided continuous shield
- Case material ..... Zn
- MTBF (MIL-HDBK-217F)..... 5.0×10<sup>5</sup> hrs
- Safety (single output)
  - └ UL (UL 60950, CSA C22.2 NO.60950) : E227474/
  - └ CE (EN 60950)through TÜV

### ELECTRICAL SPECIFICATIONS

<b>INPUT</b>	<ul style="list-style-type: none"> <li>• Input range ..... DC 10V - 36V (PT 15-24), DC 20V - 72 V (PT 15-48)</li> <li>• Efficiency ..... 80 - 87% typ.</li> <li>• Remote on / off ..... TTL compatible               <ul style="list-style-type: none"> <li>└ On : 2.5 to 5.5VDC or open</li> <li>└ Off : 0 to 0.8 VDC</li> </ul> </li> </ul>
<b>OUTPUT</b>	<ul style="list-style-type: none"> <li>• Voltage tolerance ..... ±2% (single and uncomplementary dual)                ±3% (complementary dual)</li> <li>• Line regulation ..... ±0.25% @ output1                ±5% @ output2, 3</li> <li>• Load regulation ..... ±0.25% @ single                ±2.5% @ dual                ±0.25% output1                ±8% output 2, 3 } @ Triples / 50% L-FL max (aux) bal. Loads</li> <li>• Ripple and Noise, pk-pk ..... Bandwidth : 20MHz                Magnitude : 1% Vout nom</li> </ul>
<b>PROTECTION CIRCUIT</b>	<ul style="list-style-type: none"> <li>• Short circuit protection ..... Current limited output (note2)</li> <li>• Over voltage protection ..... Work at 115 ~ 140% of rating</li> </ul>
<b>ELECTRICALLY ISOLATED</b>	<ul style="list-style-type: none"> <li>• Isolation ..... Input-output, input-case, output-case / DC 500V, 100Mohms</li> <li>• High pot ..... Input-output, input-case, output-case / AC 500V, 1minute</li> </ul>

**NOTE** 1. As a factory added option, the all model can be operated down to -40℃, the suffix 'M' should be added to the model number when ordering. ex) PTS15-48-522M  
 2. Long term continuous operation into a short circuit will compromise the reliability of the unit.

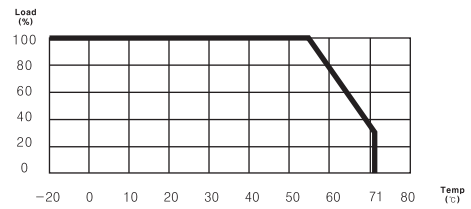
## Ordering Information

Input	Output1	Output2	Output3	Maximum Power	Ripple&Noise max	Efficiency Typ.	Model Number
10 - 36V	3.3V@4.00A			13.2W	75mVp-p	80%	PTS15-24-3R3
10 - 36V	5V@3.00A			15.0W	75mVp-p	85%	PTS15-24-5
10 - 36V	12V@1.25A			15.0W	120mVp-p	86%	PTS15-24-12
10 - 36V	15V@1.00A			15.0W	150mVp-p	84%	PTS15-24-15
10 - 36V	5V@1.50A	-5V@1.50A		15.0W	50/50mVp-p	85%	PTD15-24-55
10 - 36V	12V@0.625A	-12V@0.625A		15.0W	120/120mVp-p	87%	PTD15-24-1212
10 - 36V	15V@0.50A	-15V@0.50A		15.0W	150/150mVp-p	87%	PTD15-24-1515
10 - 36V	3.3V@2.0A	12V@0.31A	-12V@0.31A	12.39W	50/120/120mVp-p	83%	PT15-24-322
10 - 36V	5V@1.50A	12V@0.31A	-12V@0.31A	15.0W	50/120/120mVp-p	84%	PT15-24-522
10 - 36V	3.3V@2.0A	15V@0.25A	-15V@0.25A	12.45W	50/150/150mVp-p	83%	PT15-24-3FF
10 - 36V	5V@1.50A	15V@0.25A	-15V@0.25A	15.0W	50/150/150mVp-p	84%	PT15-24-5FF
20 - 72V	3.3V@4.00A			13.2W	75mVp-p	80%	PTS15-48-3R3
20 - 72V	5V@3.00A			15.0W	75mVp-p	85%	PTS15-48-5
20 - 72V	12V@1.25A			15.0W	120mVp-p	87%	PTS15-48-12
20 - 72V	15V@1.00A			15.0W	150mVp-p	87%	PTS15-48-15
20 - 72V	5V@1.50A	-5V@1.50A		15.0W	50/50mVp-p	85%	PTD15-48-55
20 - 72V	12V@0.625A	-12V@0.625A		15.0W	120/120mVp-p	86%	PTD15-48-1212
20 - 72V	15V@0.50A	-15V@0.50A		15.0W	150/150mVp-p	87%	PTD15-48-1515
20 - 72V	3.3V@2.0A	12V@0.31A	-12V@0.31A	12.39W	50/120/120mVp-p	83%	PT15-48-322
20 - 72V	5V@1.50A	12V@0.31A	-12V@0.31A	15.0W	50/120/120mVp-p	84%	PT15-48-522
20 - 72V	3.3V@2.0A	15V@0.25A	-15V@0.25A	12.45W	50/150/150mVp-p	83%	PT15-48-3FF
20 - 72V	5V@1.50A	15V@0.25A	-15V@0.25A	15.0W	50/150/150mVp-p	84%	PT15-48-5FF

## Pin assignments

Single Output	Dual Output	Triple Output
1. +Vin	1. +Vin	1. +Vin
2. -Vin	2. -Vin	2. -Vin
3. No pin	3. No pin	3. No pin
4. Control(enable)	4. Control(enable)	4. Control(enable)
5. No connect	5. Output1	5. Output2
6. +Vout	6. COM	6. Output1
7. -Vout	7. Output2	7. GND
8. Trim	8. Trim	8. Output3

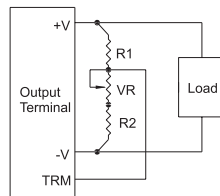
## Derating curve



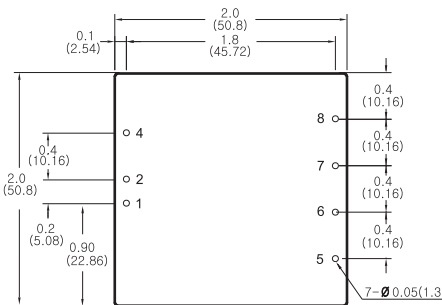
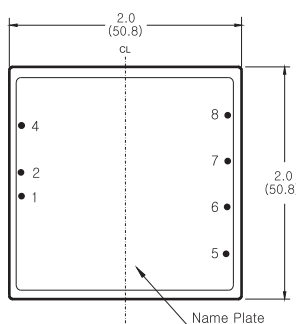
## External Parts

Model	Output Voltage	VR	R1	R2
PTS 15	5V	1K	1.0K	680Ω
	12V	1K	3.9K	680Ω
	15V	1K	5.6K	750Ω
PTD 15	±5V (10V)	1K	3.3K	680Ω
	±12V (24V)	5K	9.0K	820Ω
	±15V (30V)	5K	20.0K	910Ω

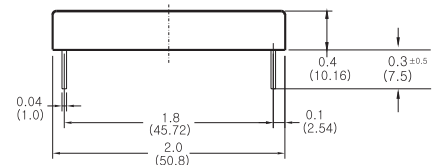
## Trim method



## Dimensions



※ Mounting hole top view



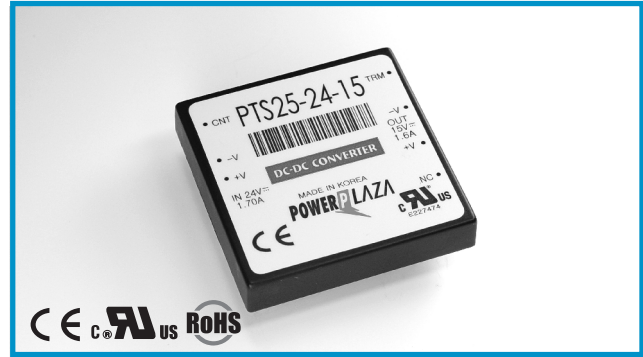
### NOTES

- All dimensions are in inches and (mm).
- Weight : 75g or less

# PT 25

## PT 25 Watt Series DC/DC Converters

**Total power** 25 Watts  
**Input voltages** 24V, 48V  
**#of outputs** Single, Dual, Triple Output



### SPECIAL FEATURES

- CE(LVD), UL marking
- High efficiency
- Industrial standard pin output
- 300KHz fixed frequency
- Wide 2:1 input range
- Isolated output
- Small, compact size 2.0" × 2.0" × 0.50"
- Surface mount internal construction
- Six sided EMI shielding
- Low output ripple & noise
- Remote on / off control
- Output voltage variation (TRM)
- Over voltage protection (O.V.P.)
- Short circuit protection
- Current mode control
- 3 years warranty

### ENVIRONMENTAL

- Operating temperature range ..... -20 °C ~ 71 °C
- Option, see Note 1 ..... -40 °C ~ 85 °C
- Storage temperature range ..... -40 °C ~ 105 °C
- Operating humidity (non condensing) ..... 20% ~ 90%RH
- Storage humidity (non condensing) ..... 10% ~ 95%RH
- Cooling method ..... Convection
- EMI / RFI ..... Six-sided continuous shield
- Case material ..... Zn
- MTBF (MIL-HDBK-217F) ..... 4.5 × 10<sup>6</sup> hrs
- Safety (single output)
  - └ UL (UL 60950, CSA C22.2 NO.60950) : E227474/
  - └ CE (EN 60950) through TÜV

### ELECTRICAL SPECIFICATIONS

<b>INPUT</b>	<ul style="list-style-type: none"> <li>• Input range ..... DC 18V - 36 V (PT 25-24), DC 36V - 72 V (PT 25-48)</li> <li>• Efficiency ..... 80 - 89% typ.</li> <li>• Remote on / off ..... TTL compatible                             <ul style="list-style-type: none"> <li>└ On : DC 2.5V - 5.5V or open</li> <li>└ Off : DC 0V - 0.8V</li> </ul> </li> </ul>
<b>OUTPUT</b>	<ul style="list-style-type: none"> <li>• Voltage tolerance ..... ±2% (single and uncomplementary dual)                              ..... ±3% (complementary dual)</li> <li>• Line regulation ..... ±0.25% @ output1                              ..... ±5% @ output 2, 3</li> <li>• Load regulation ..... ±0.25% @ single                              ..... ±2.5% @ dual                              ..... ±0.25% output1                              ..... ±8% output 2, 3 ] @ Triples / 50% L-FL max (aux) bal. Loads</li> <li>• Ripple and Noise, pk-pk ..... Bandwidth : 20MHz                              ..... Magnitude : 1% Vout nom</li> </ul>
<b>PROTECTION CIRCUIT</b>	<ul style="list-style-type: none"> <li>• Short circuit protection ..... Current limited output (note2)</li> <li>• Over voltage protection ..... Work at 115~140% or rating</li> </ul>
<b>ELECTRICALLY ISOLATED</b>	<ul style="list-style-type: none"> <li>• Isolation ..... Input-output, input-case, output-case / DC 500V, 100Mohms</li> <li>• High pot ..... Input-output, input-case, output-case / AC 500V, 1minute</li> </ul>

**NOTE** 1. As a factory added option, the all model can be operated down to -40 °C, the suffix 'M' should be added to the model number when ordering. ex) PT25-48-522M  
 2. Long term continuous operation into a short circuit will compromise the reliability of the unit.

## Ordering Information

Input	Output1	Output2	Output3	Maximum Power	Ripple&Noise max	Efficiency Typ.	Model Number
18 - 36V	3.3V@6.0A			19.8W	100mVp-p	80%	PTS25-24-3R3
18 - 36V	5V@5.0A			25.0W	100mVp-p	85%	PTS25-24-5
18 - 36V	12V@2.0A			24.0W	120mVp-p	89%	PTS25-24-12
18 - 36V	15V@1.6A			24.0W	150mVp-p	89%	PTS25-24-15
18 - 36V	5V@2.5A	-5V@2.50A		25.0W	75/75mVp-p	84%	PTD25-24-55
18 - 36V	12V@1.0A	-12V@1.00A		24.0W	120/120mVp-p	88%	PTD25-24-1212
18 - 36V	15V@0.8A	-15V@0.80A		24.0W	150/150mVp-p	87%	PTD25-24-1515
18 - 36V	3.3V@3.5A	12V@0.35A	-12V@0.35A	19.95W	75/120/120mVp-p	83%	PT25-24-322
18 - 36V	5V@3.5A	12V@0.35A	-12V@0.35A	25.9W	75/120/120mVp-p	84%	PT25-24-522
18 - 36V	3.3V@3.5A	15V@0.28A	-15V@0.28A	19.95W	75/150/150mVp-p	83%	PT25-24-3FF
18 - 36V	5V@3.5A	15V@0.25A	-15V@0.25A	25.0W	75/150/150mVp-p	84%	PT25-24-5FF
36 - 72V	3.3V@6.0A			19.8W	100mVp-p	81%	PTS25-48-3R3
36 - 72V	5V@5.0A			25.0W	100mVp-p	85%	PTS25-48-5
36 - 72V	12V@2.0A			24.0W	120mVp-p	89%	PTS25-48-12
36 - 72V	15V@1.6A			24.0W	150mVp-p	89%	PTS25-48-15
36 - 72V	5V@2.5A	-5V@2.50A		25.0W	75/75mVp-p	84%	PTD25-48-55
36 - 72V	12V@1.0A	-12V@1.00A		24.0W	120/120mVp-p	88%	PTD25-48-1212
36 - 72V	15V@0.8A	-15V@0.80A		24.0W	150/150mVp-p	87%	PTD25-48-1515
36 - 72V	3.3V@3.5A	12V@0.35A	-12V@0.35A	19.95W	75/120/120mVp-p	83%	PT25-48-322
36 - 72V	5V@3.5A	12V@0.35A	-12V@0.35A	25.9W	75/120/120mVp-p	84%	PT25-48-522
36 - 72V	3.3V@3.5A	15V@0.28A	-15V@0.28A	19.95W	75/150/150mVp-p	83%	PT25-48-3FF
36 - 72V	5V@3.5A	15V@0.25A	-15V@0.25A	25.0W	75/150/150mVp-p	84%	PT25-48-5FF

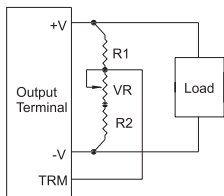
## Pin assignments

Single Output	Dual Output	Triple Output
1. +Vin	1. +Vin	1. +Vin
2. -Vin	2. -Vin	2. -Vin
3. No pin	3. No pin	3. No pin
4. Control(enable)	4. Control(enable)	4. Control(enable)
5. No connect	5. Output1	5. Output2
6. +Vout	6. COM	6. Output1
7. -Vout	7. Output2	7. GND
8. Trim	8. Trim	8. Output3

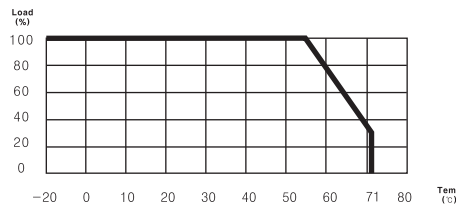
## External Parts

Model	Output Voltage	VR	R1	R2
PTS 25	5V	1K	1K	680Ω
	12V	1K	3.9K	680Ω
	15V	1K	5.6K	750Ω
PTD 25	±5V (10V)	1K	3.3K	680Ω
	±12V (24V)	5K	9.0K	820Ω
	±15V (30V)	5K	20.0K	910Ω

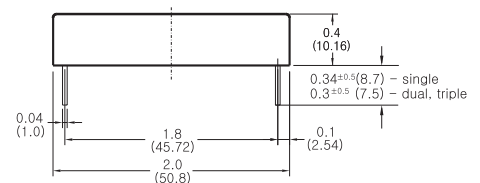
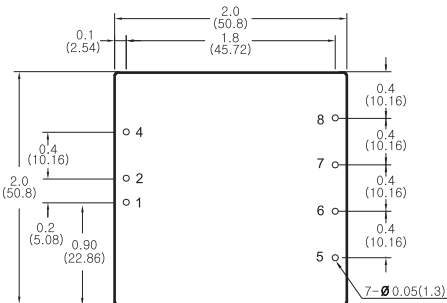
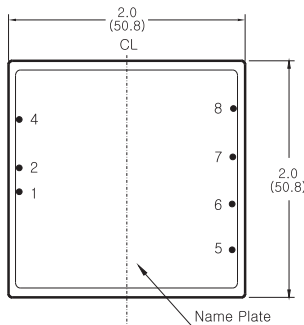
## Trim method



## Derating curve



## Dimensions



### NOTES

- All dimensions are in inches and (mm).
- Weight : 80g or less

※ Mounting hole top view