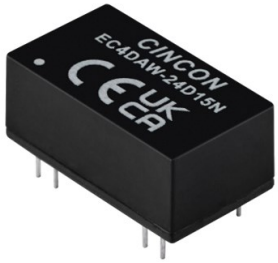
EC4DAW SERIES
6 WATT 4:1 INPUT
ISOLATED DC-DC CONVERTER

Features

- Efficiency Up to 87%
- Fixed Switching Frequency
- Regulated Outputs
- Negative Remote On/Off
- 3000Vdc I/O Isolation
- Continuous Short Circuit Protection
- Safety Meets IEC/EN/UL 62368-1
- Shock & Vibration MIL-STD-810F Compliant



MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT		INPUT CURRENT		% EFF.		CAPACITOR LOAD MAX.
			MIN.	MAX.	NO LOAD	FULL LOAD	(3)	(2)	
EC4DAW-24S33N	9-36 VDC	3.3 VDC	0 mA	1500 mA	5 mA	258 mA	81	80	4700 uF
EC4DAW-24S05N	9-36 VDC	5 VDC	0 mA	1200 mA	6 mA	303 mA	83.5	82.5	2200 uF
EC4DAW-24S12N	9-36 VDC	12 VDC	0 mA	500 mA	6 mA	289 mA	87	86.5	1100 uF
EC4DAW-24S15N	9-36 VDC	15 VDC	0 mA	400 mA	7 mA	291 mA	87	86	470 uF
EC4DAW-24D12N	9-36 VDC	±12 VDC	0 mA	±250 mA	9 mA	291 mA	86	86	660 uF
EC4DAW-24D15N	9-36 VDC	±15 VDC	0 mA	±200 mA	9 mA	294 mA	85.5	85	220 uF
EC4DAW-48S33N	18-74 VDC	3.3 VDC	0 mA	1500 mA	4 mA	128 mA	80.5	80.5	4700 uF
EC4DAW-48S05N	18-74 VDC	5 VDC	0 mA	1200 mA	4 mA	153 mA	82	82	2200 uF
EC4DAW-48S12N	18-74 VDC	12 VDC	0 mA	500 mA	5 mA	144 mA	87	87	1100 uF
EC4DAW-48S15N	18-74 VDC	15 VDC	0 mA	400 mA	5 mA	146 mA	87	86	470 uF
EC4DAW-48D12N	18-74 VDC	±12 VDC	0 mA	±250 mA	5 mA	144 mA	87	87	660 uF
EC4DAW-48D15N	18-74 VDC	±15 VDC	0 mA	±200 mA	5 mA	146 mA	86.5	86	220 uF

NOTE:

1. Nominal Input Voltage 24 or 48VDC.
2. Measured at Nominal Input Voltage.
3. Measured at 12VDC for 24V_{in}, 24VDC for 48V_{in}.

PART NUMBER

Series	Nominal Input Voltage	Number of Outputs	Nominal Output Voltage	Remote On/Off Logic
EC4DAW	II	O	XX	Y
EC4DAW	24 : 24 VDC 48 : 48 VDC	S : Single D : Dual	33 : 3.3VDC 05 : 5.0VDC 12 : 12VDC 15 : 15VDC	N : Negative

Part Number Example:

EC4DAW-24S12N: 6W, 4:1 9-36V_{dc} Input, Single 12V_{dc} Output, Negative Logic

TECHNICAL SPECIFICATIONS

(All specifications are typical at nominal input, full load at 25℃ unless otherwise noted.)

ABSOLUTE MAXIMUM RATINGS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Input Voltage	Continuous	24V_{in} 48V_{in}	-0.3 -0.3		36 74	V_{dc}
Input Surge Voltage	100ms max.	24V_{in} 48V_{in}			50 100	V_{dc}
Operating Ambient Temperature	With de-rating, above 61℃	V_o=3.3V V_o=5V	-40		85	℃
	With de-rating, above 65℃	V_o=12V V_o=15V V_o=±12V V_o=±15V				
Maximum Case Temperature	At the center part of case plate	All			105	℃
Storage Temperature		All	-55		125	℃

INPUT CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Operating Input Voltage		24V_{in} 48V_{in}	9 18	24 48	36 74	V_{dc}
Maximum Input Current	V_{in}=9V, Full load V_{in}=18V, Full load	24V_{in} 48V_{in}		0.8 0.4		A
No-Load Input Current	V_{in}=24, 48V, I_o=0A	See Model Number Table				mA
Input Filter	Pi type	All				
Inrush Current (I^2t)	As per ETS300 132-2	All			0.1	A^2s
Input Reflected Ripple Current	V_{in}=nominal, L=12uH, C=47uF, Load=full load	All		10		mA

OUTPUT CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Voltage Set Point Accuracy	V_{in}=24, 48V, Full load, T_c=25℃	All	-1.5		+1.5	%
Output Voltage Balance	V_{in}=24, 48V, Full load, T_c=25℃	Dual	-1.0		+1.0	%
Output Voltage Regulation						
Load Regulation	Full load to no load	All			±0.5	%
Line Regulation	V_{in}=High line to low line, full load	Single Dual			±0.2 ±0.5	%
Cross Regulation	Asymmetrical load 25%/100%	Dual			±5.0	%
Temperature Coefficient	T_c=-40℃ to 85℃	All			±0.03	%/℃
Output Voltage Ripple and Noise (5Hz to 20MHz bandwidth)						
Peak-to-Peak	Full load, T_c=25℃ 1uF ceramic capacitor	XXS15N Others			120 100	mV
Output Current Range	V_{in}= 9 to 36V, 18 to 74V	See Model Number Table				A
Over Current Protection	Hiccup mode. Auto recovery	All		180		%
Short Circuit Protection		All		Continuous, Auto Recovery		
External Load Capacitance	Full load (resistive)	See Model Number Table				uF

EFFICIENCY

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
100% Load	V_{in}=24V, 48V	See Model Number Table				%

DYNAMIC CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Output Voltage Current Transient						
Error Band	75% to 100% of $I_{o_max.}$ step load change di/dt=0.1A/us (within 1% V_{out} nominal)	All			±5	%
Recovery Time		All			250	us
Turn-On Delay and Rise Time	Full load (Constant resistive load)					
Turn-On Delay Time, From On/Off Control	$V_{on/off}$ to 10%V_{o_set}, Remote on	All		15		ms
Turn-On Delay Time, From Input	$V_{in_min.}$ to 10%V_{o_set}, Power up	All		15		ms
Output Voltage Rise Time	10%V_{o_set} to 90%V_{o_set}	All		8		ms

ISOLATION CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Isolation Voltage (100% factory Hi-Pot tested @2sec.)	1 Minute; input to output	All			3000	V_{dc}
Isolation Resistance	Input to output	All	1000			MΩ
Isolation Capacitance	Input to output	All		500		pF

FEATURE CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Switching Frequency	Pulse width modulation (PWM), fixed	All		580		KHz
On/Off Control, Negative Remote On/Off Logic, Refer to -Vin Pin						
Logic High (Module Off)	$V_{on/off}$ at $I_{on/off}$	All	2		4	mA
Logic Low (Module On)	Pin open=on, high impedance	All				
Off Converter Input Current	Shutdown input idle current	All			2.5	mA

GENERAL SPECIFICATIONS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
MTBF	I_o=100% of $I_{o_max.}$; MIL-HDBK - 217F_Notice 1, GB, 25°C	24S33		4650		K hours
		24S05		4136		
		24S12		3920		
		24S15		4382		
		24D12		3302		
		24D15		3851		
		48S33		4675		
		48S05		4132		
		48S12		3899		
		48S15		4671		
		48D12		3387		
		48D15		4278		
Weight		All		6.5		grams
Case Material	Non-Conductive Black Plastic, UL 94V-0					
Potting Material	UL 94V-0					
Pin Material	Base: Copper with Steel Plating:Bright Tin					
Shock/Vibration	MIL-STD-810F Compliant					
Humidity	95% RH max. Non condensing					
Altitude	2000m Operating altitude, 12000m Transport altitude					
Thermal Shock	MIL-STD-810F					

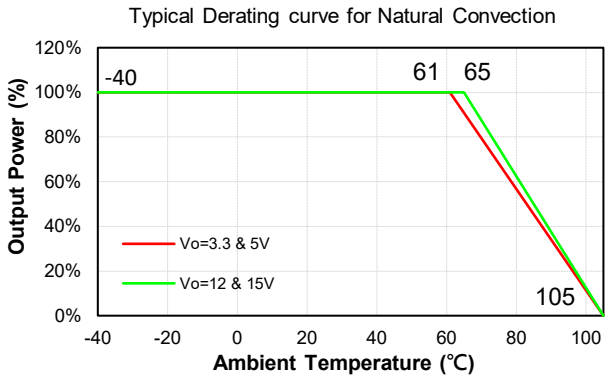
GENERAL SPECIFICATIONS

EMC SPECIFICATIONS (External components required, please refer to application note.)

EMI	Meets EN 55032 (with external filter)		Class A
ESD	Meets EN 61000-4-2	Level 2: Air ±8kV, Contact ±4kV	Perf. Criteria A
Radiated immunity	Meets EN 61000-4-3	Level 2: 80~1000MHz, 3V/m	Perf. Criteria A
Fast Transient	Meets EN 61000-4-4	Level 2: On power input port, ±0.5kV, external input capacitor required	Perf. Criteria A
Surge	Meets EN 61000-4-5	Level 2: Line to earth, ±1kV, Line to line, ±0.5kV, external input capacitor required	Perf. Criteria A
Conducted immunity	Meets EN 61000-4-6	Level 2: 0.15~80MHz, 3V	Perf. Criteria A
Application Note Link			EC4DAW Series App Notes
Packaging Information Link			Packaging Information

CHARACTERISTIC CURVE

Power Derating Curve



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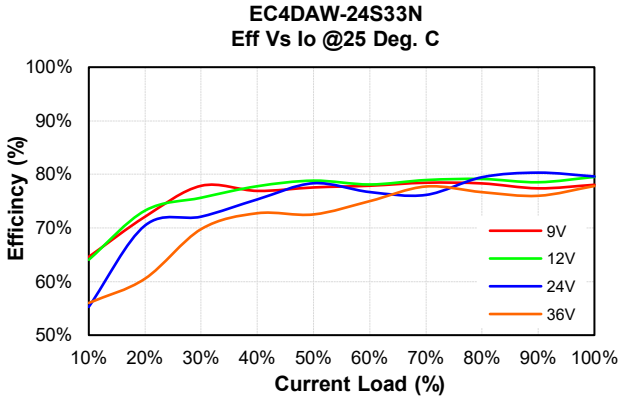
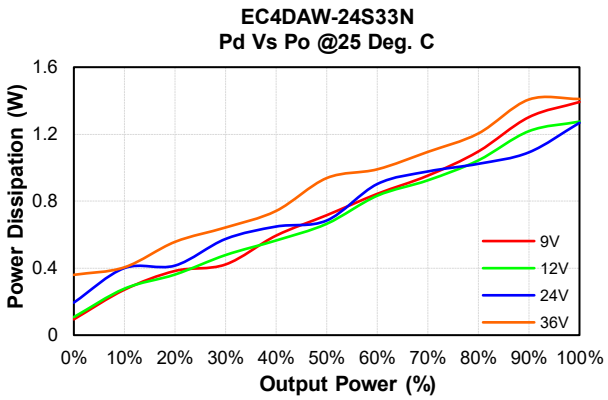
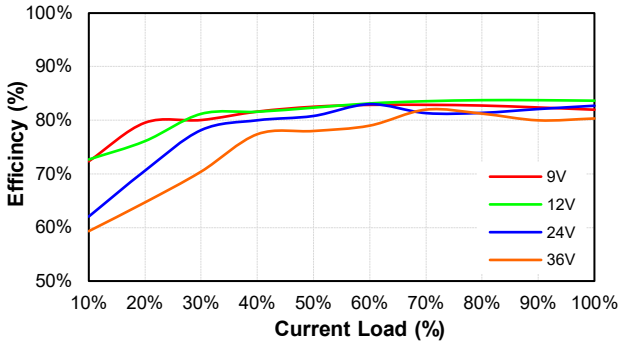




EC4DAW-24S05N
Eff Vs Io @25 Deg. C



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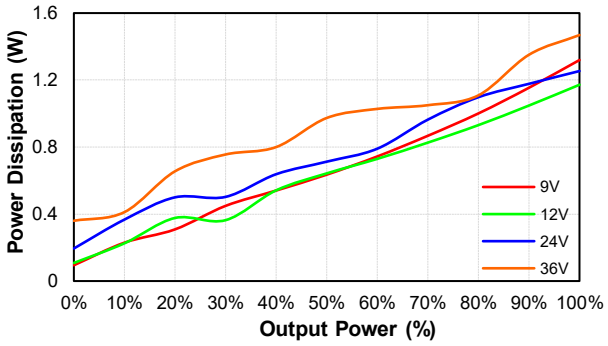

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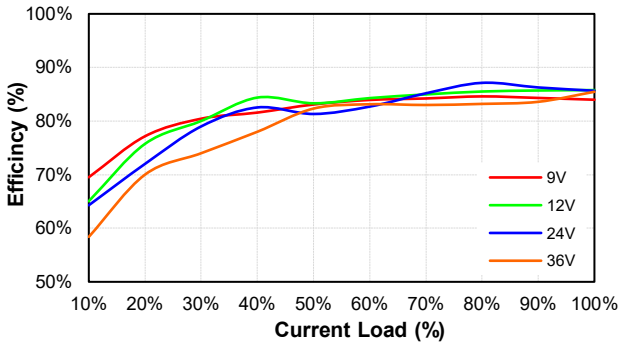

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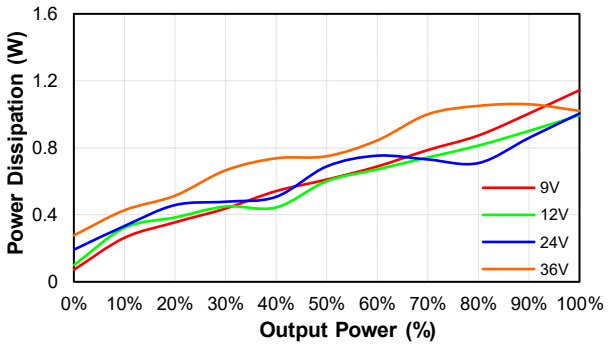

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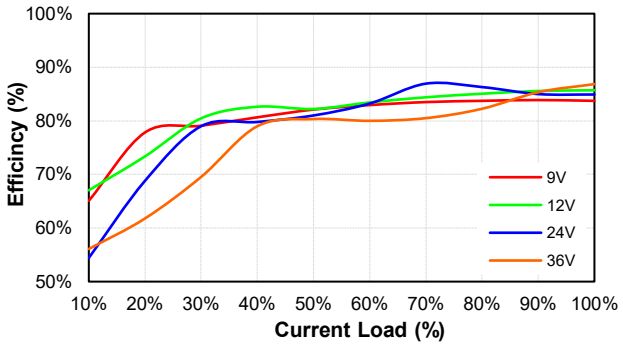

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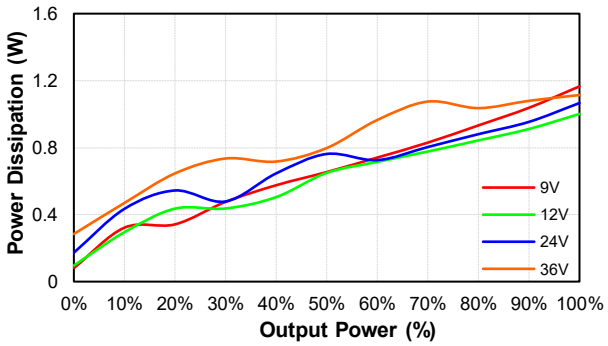

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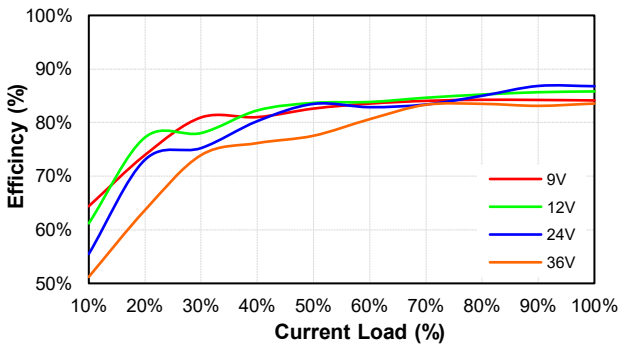

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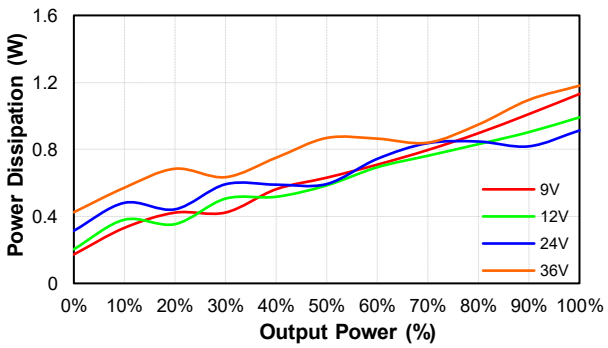

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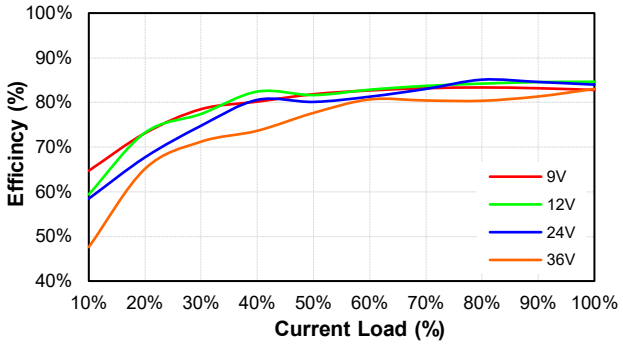

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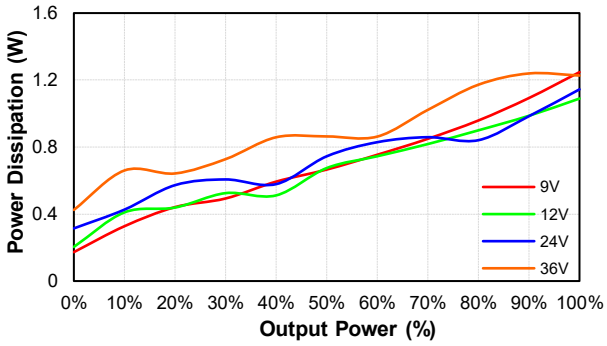

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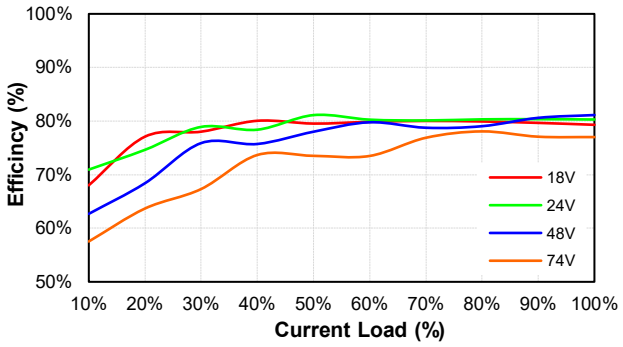

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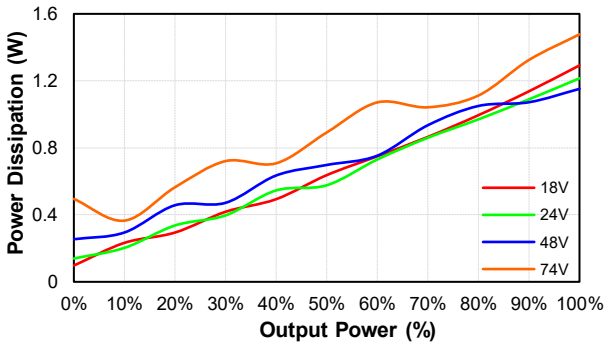

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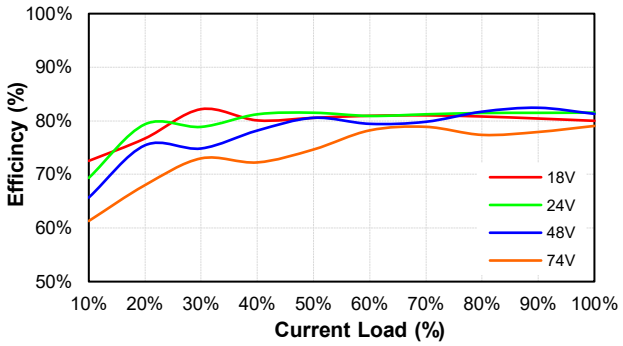

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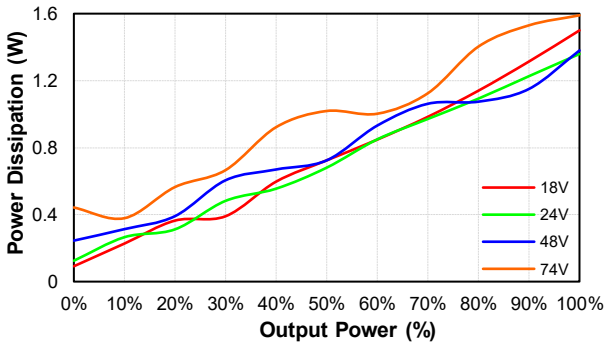

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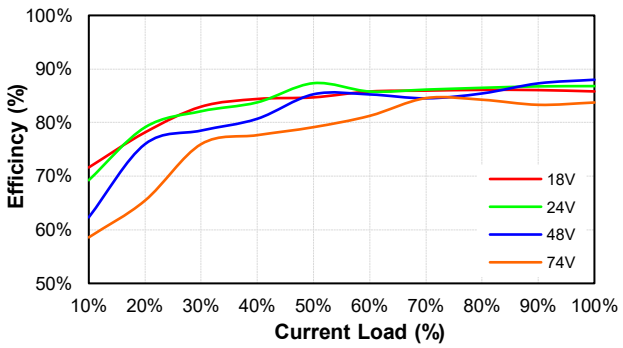

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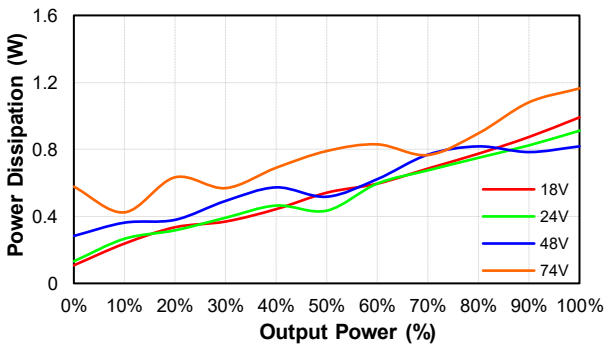

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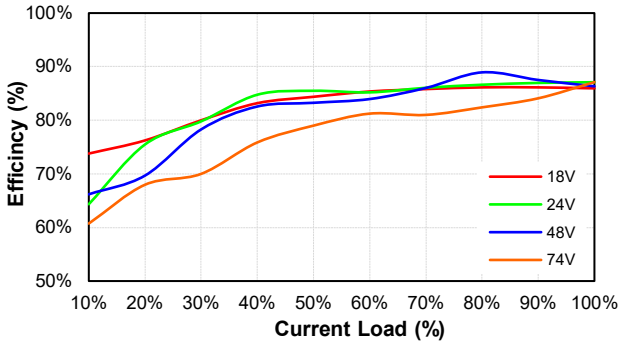

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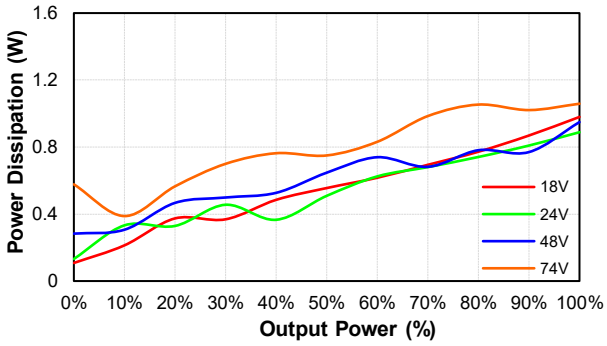

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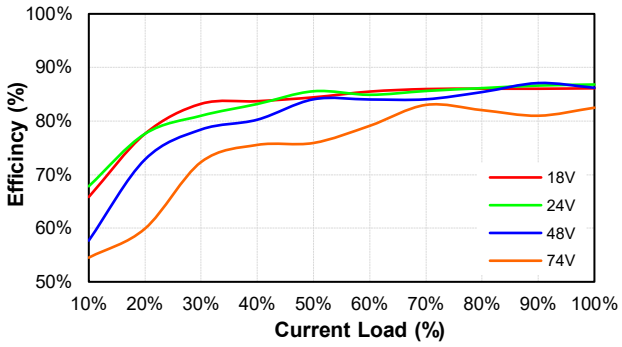

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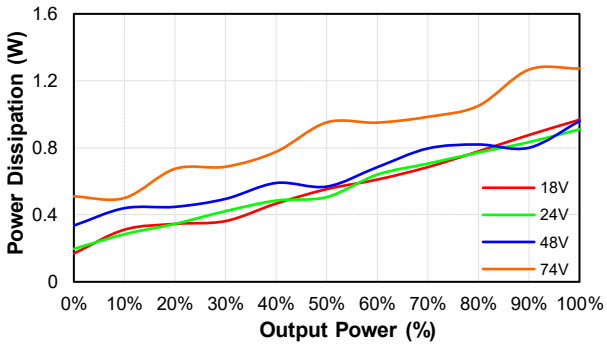

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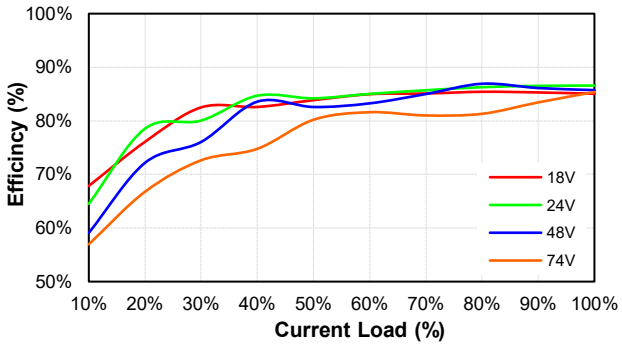

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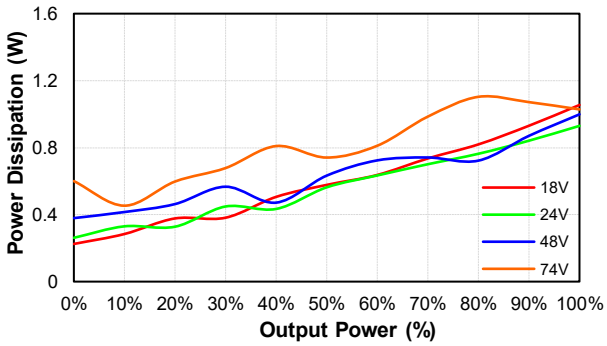
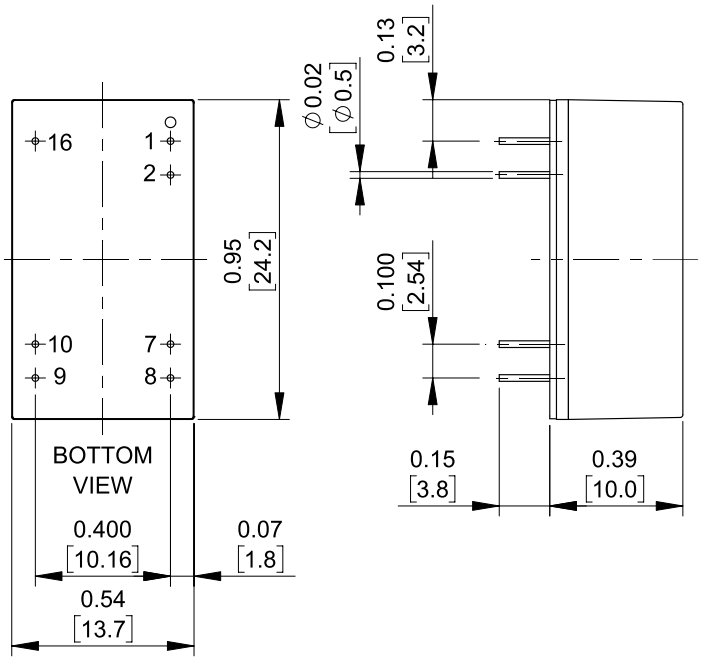


MECHANICAL SPECIFICATION



All Dimensions in Inches[mm]
Tolerance Inches: x.xx=±0.02, x.xxx=±0.010
Millimeters: x.x=±0.5, x.xx=±0.25

Pin Connection

Pin	Single	Dual
1	-V Input	-V Input
2	Remote	Remote
7	NC	NC
8	NC	Common
9	+V Output	+V Output
10	-V Output	-V Output
16	+V Input	+V Input

Note:Pin Size is ∅0.02±0.002 Inch [∅0.5±0.05 mm]
NC-No Connection with Pin

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Web: www.cincon.com