



EC5DAW SERIES 10 WATT 4:1 INPUT ISOLATED DC-DC CONVERTER

Features

- Efficiency Up to 89%
- 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	(2)	(1)	
EC5DAW-24S33N	9-36 VDC	3.3 VDC	0 mA	2000 mA	6 mA	342 mA	80	80.5	2000uF
EC5DAW-24S05N	9-36 VDC	5 VDC	0 mA	2000 mA	6 mA	496 mA	83	84	2000uF
EC5DAW-24S12N	9-36 VDC	12 VDC	0 mA	833 mA	6 mA	471 mA	88.5	88.5	833uF
EC5DAW-24S15N	9-36 VDC	15 VDC	0 mA	666 mA	6 mA	468 mA	88	89	666uF
EC5DAW-24D12N	9-36 VDC	±12 VDC	0 mA	±417 mA	7 mA	471 mA	87.5	88.5	417uF
EC5DAW-24D15N	9-36 VDC	±15 VDC	0 mA	±333 mA	7 mA	473 mA	87	88	333uF
EC5DAW-48S33N	18-74 VDC	3.3 VDC	0 mA	2000 mA	6 mA	173 mA	79	79.5	2000uF
EC5DAW-48S05N	18-74 VDC	5 VDC	0 mA	2000 mA	6 mA	248 mA	83	84	2000uF
EC5DAW-48S12N	18-74 VDC	12 VDC	0 mA	833 mA	6 mA	238 mA	87.5	87.5	833uF
EC5DAW-48S15N	18-74 VDC	15 VDC	0 mA	666 mA	6 mA	237 mA	88	88	666uF
EC5DAW-48D12N	18-74 VDC	±12 VDC	0 mA	±417 mA	6 mA	240 mA	87	87	417uF
EC5DAW-48D15N	18-74 VDC	±15 VDC	0 mA	±333 mA	6 mA	238 mA	86.5	87.5	333uF

NOTE:

1. Nominal Input Voltage 24 or 48VDC
2. Measured at 12VDC for 24Vin, 24VDC for 48Vin
3. For 3.3Vo and 5Vo has Derating by Input is Required

PART NUMBER

Series	Nominal Input Voltage	Number of Outputs	Nominal Output Voltage	Remote On/Off Logic
EC5DAW	II	O	XX	N : Negative
EC5DAW	24 : 24 VDC 48 : 48 VDC	S : Single	33 : 3.3VDC 05 : 5.0VDC 12 : 12VDC 15 : 15VDC	
		D : Dual	12 : ±12 VDC 15 : ±15 VDC	

Part Number Example:

EC5DAW-24S12N: 10W, 4:1 9-36Vdc Input, Single 12Vdc Output, Negative Logic

TECHNICAL SPECIFICATIONS

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

ABSOLUTE MAXIMUM RATINGS

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

INPUT CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Operating Input Voltage		24Vin	9	24	36	V _{dc}
		48Vin	18	48	74	
Input Under Voltage Lockout						
Turn-On Voltage Threshold	100% Load	24Vin	8	8.5	8.8	V _{dc}
		48Vin	16.5	17	17.5	
Turn-Off Voltage Threshold	100% Load	24Vin	7	7.6	8.3	V _{dc}
		48Vin	15	15.8	16.5	
Lockout Hysteresis Voltage	100% Load	24Vin		0.5		V _{dc}
		48Vin		1		
Maximum Input Current	V _{in} =9V, Full load	24Vin		1.4		A
	V _{in} =18V, Full load	48Vin		0.7		
No-Load Input Current	V _{in} =24, 48V, I _o =0A	See Model Number Table				mA
Input Filter	Pi Type	All				
Inrush Current (I ² t)	As per ETS300 132-2.	All			0.1	A ² s
Input Reflected Ripple Current	V _{in} =Nominal, L=1uH, load=full load	All		30		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°C	All	-1.0		+1.0	%
Output Voltage Balance	V _{in} =24, 48V, Full load, T _c =25°C	Dual	-1.0		+1.0	%
Output Voltage Regulation						
Load Regulation	Full load to no load	All			±1.0	%
Line Regulation	V _{in} =High line to low line, full load	Single			±0.2	%
		Dual			±0.5	
Temperature Coefficient	T _c =-40°C to 85°C	All			±0.02	%/°C
Output Voltage Ripple and Noise (5Hz to 20MHz Bandwidth)						
Peak-to-Peak	Full load, 1uF ceramic capacitors	3.3Vo			100	mV
		5Vo			100	
		12Vo			120	
		15Vo			150	
Output Current Range	V _{in} = 9 to 36V, 18 to 74V	See Model Number Table				A

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Over Current Protection	Hiccup mode. Auto recovery	All		170		%
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	$V_{in}=12V, 24V$ $V_{in}=24V, 48V$	24Vin 48Vin	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 2000	V_{dc} V_{ac}
Isolation Resistance	Input to output	All	1000			MΩ
Isolation Capacitance	Input to output	All		50		pF

FEATURE CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Switching Frequency	Pulse wide modulation (PWM), Fixed	All		530		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

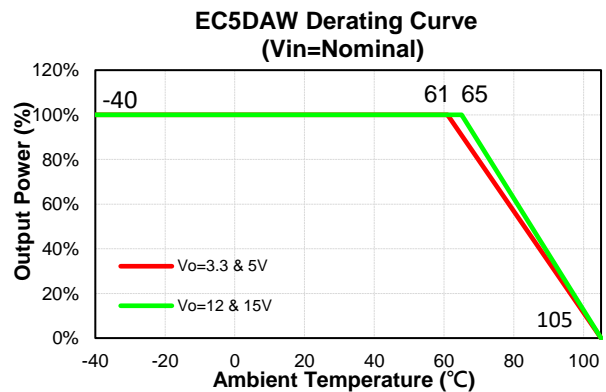
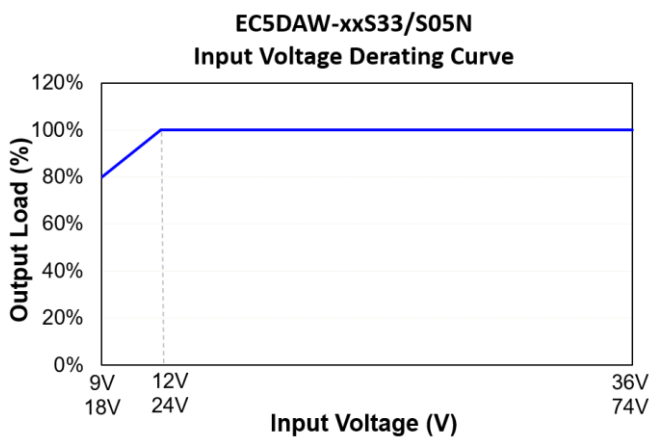
PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
MTBF	$I_o=100\%$ of I_{o_max} ; MIL-HDBK - 217F_Notice 1, GB, 25°C	24S33		2042		K hours
		24S05		1941		
		24S12		1881		
		24S15		1964		
		24D12		1722		
		24D15		1876		
		48S33		2040		
		48S05		1945		
		48S12		1903		
		48S15		1968		
		48D12		1742		
		48D15		1889		
Weight		All		6.6		grams
Case Material	Plastic, DAP, UL 94V-0					
Base plate Material	Non-Conductive Base					

GENERAL SPECIFICATIONS

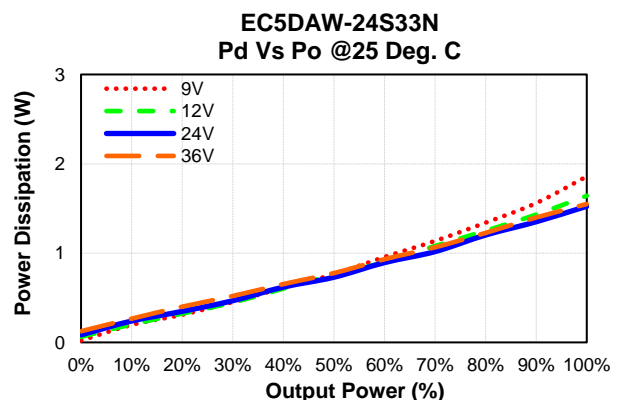
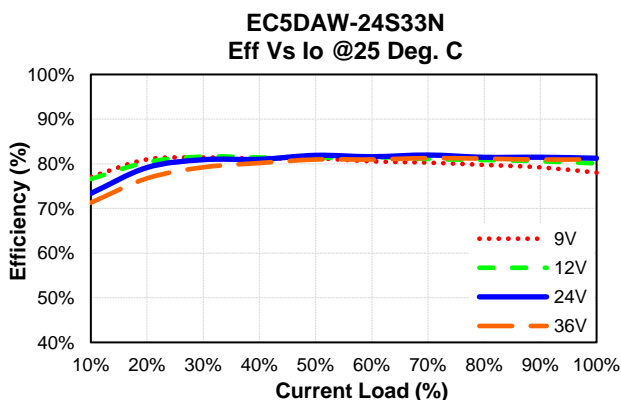
Potting Material	UL 94V-0	
Pin Material	Base: Copper with Steel Plating: Barrel Tin	
Shock/Vibration	MIL-STD-810F Compliant	
Humidity	95% RH max. Non Condensing	
Altitude	2000m Operating Altitude	
Thermal Shock	MIL-STD-810F	
EMI	Meets EN55032 (with external filter)	Class A
ESD	Meets EN61000-4-2 Level 2: Air $\pm 8kV$, Contact $\pm 4kV$	Perf. Criteria A
Radiated immunity	Meets EN61000-4-3 Level 2: 80~1000MHz, 3V/m	Perf. Criteria A
Fast Transient	Meets EN61000-4-4 Level 2: On power input port, $\pm 0.5kV$, external input TVS required	Perf. Criteria A
Surge	Meets EN61000-4-5 Level 2: Line to earth, $\pm 1kV$, Line to line, $\pm 0.5kV$, external input TVS required	Perf. Criteria A
Conducted immunity	Meets EN61000-4-6 Level 2: 0.15~80MHz, 3V	Perf. Criteria A
Application Note Link	EC5DAW Series App Notes	
Packaging Information Link	Packaging Information	

CHARACTERISTIC CURVE

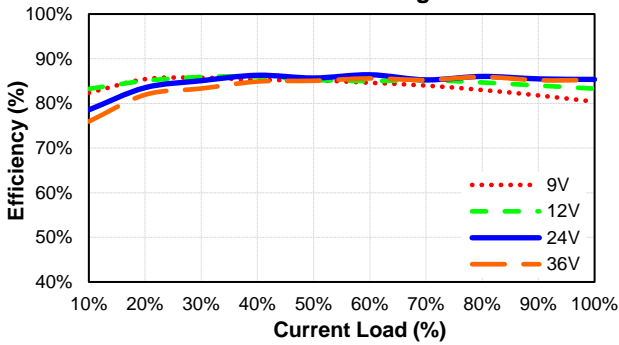
Power Derating Curve



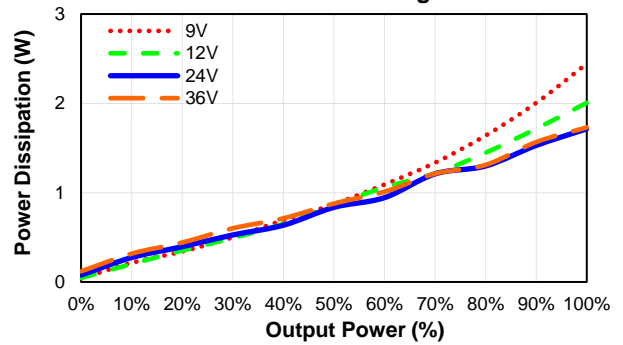
Performance Data



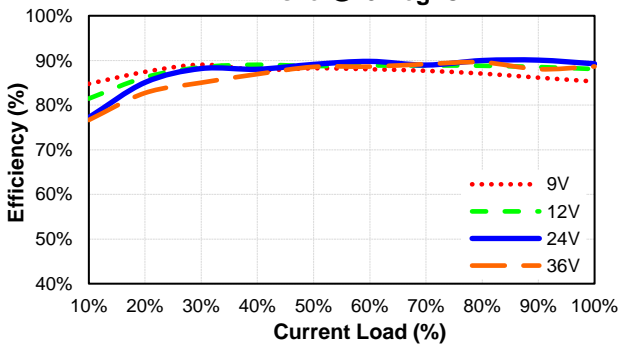
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Eff Vs Io @25 Deg. C



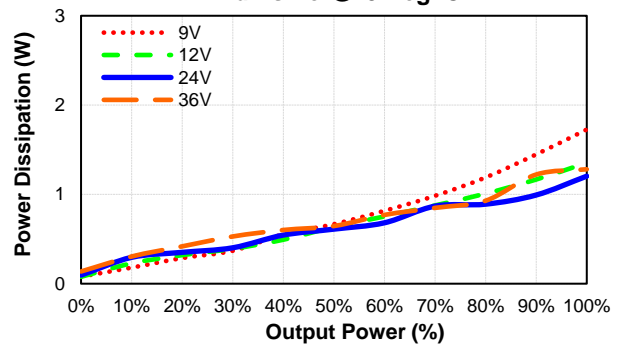
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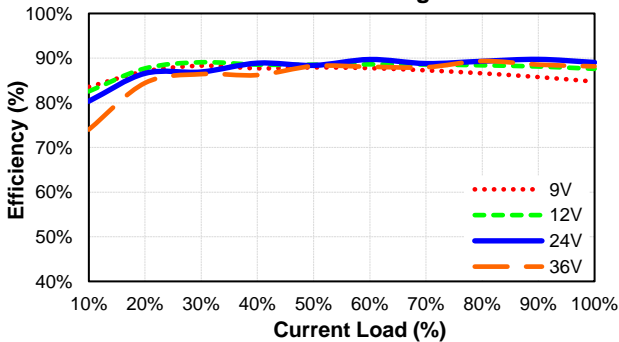
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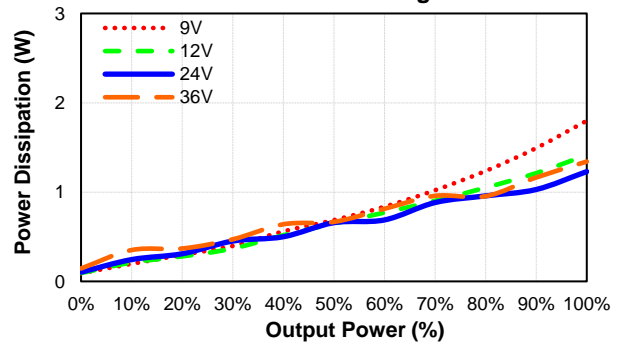
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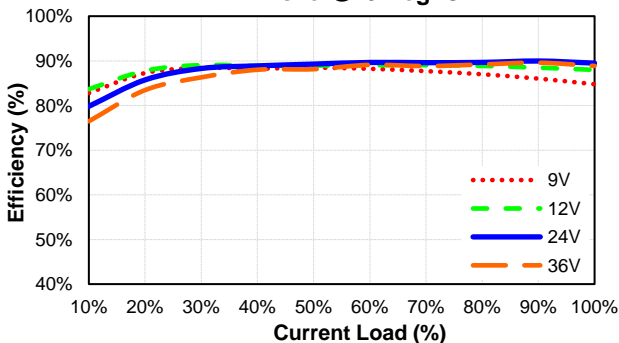
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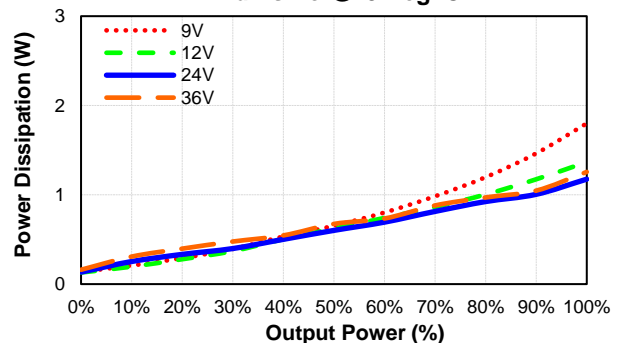
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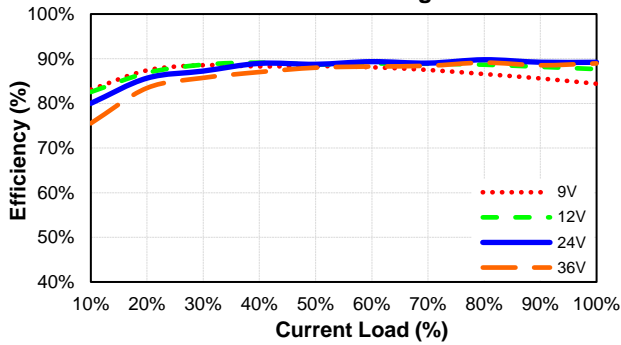
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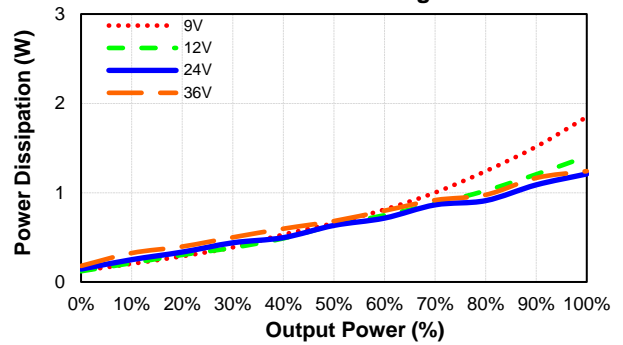
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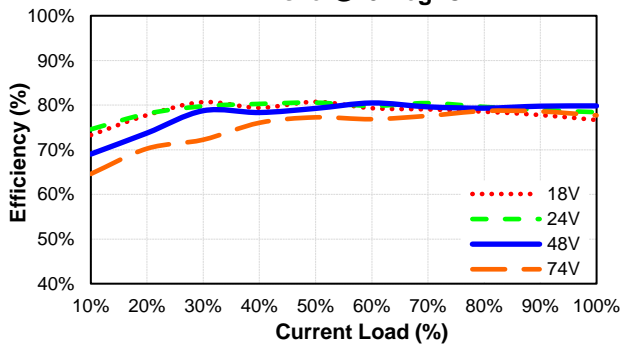
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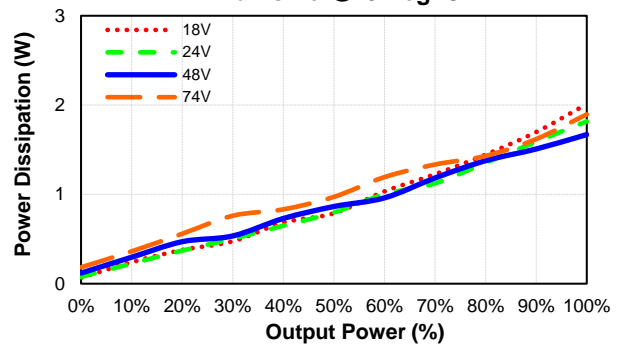
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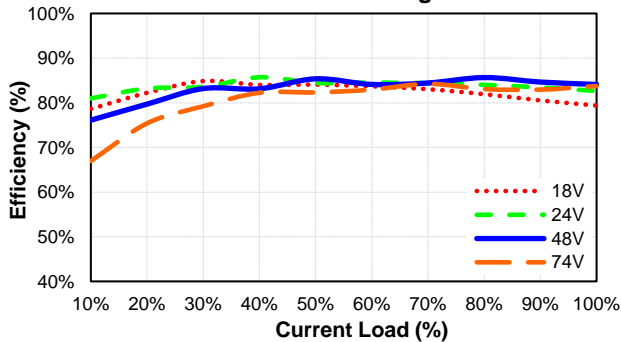
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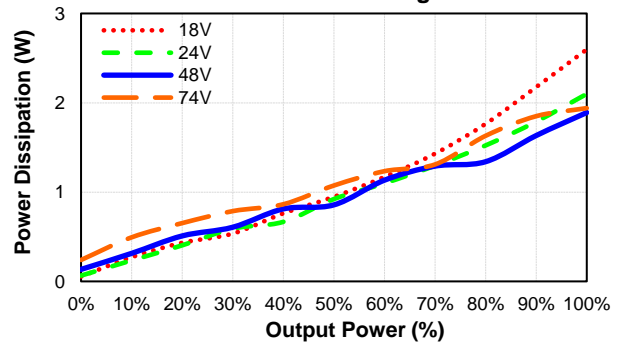
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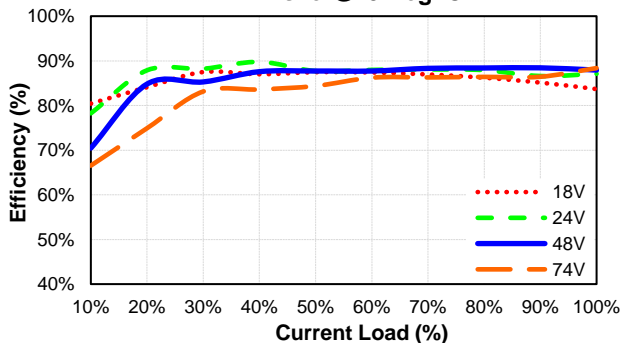
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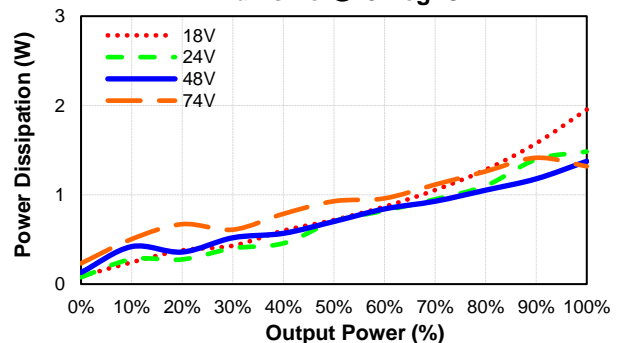
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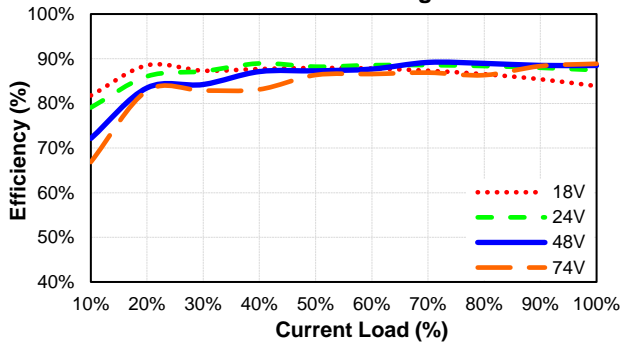
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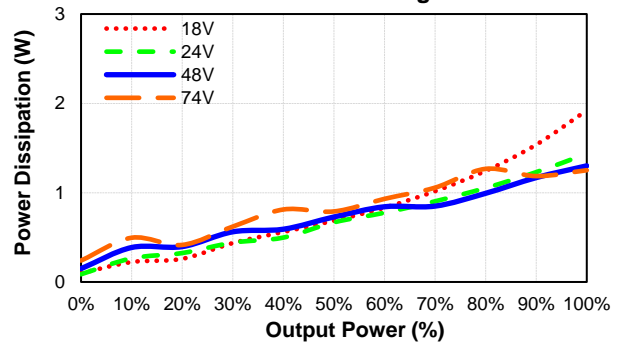
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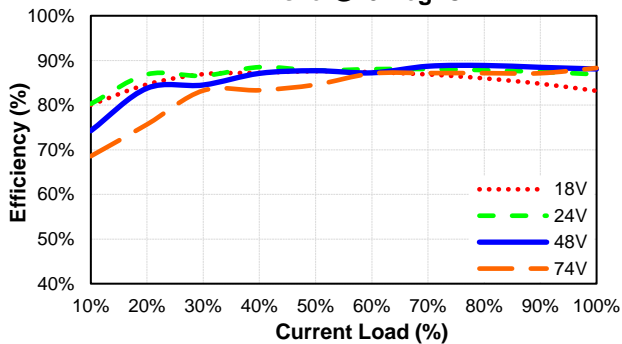
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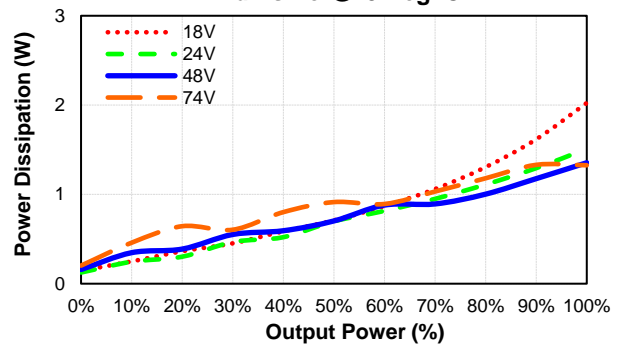
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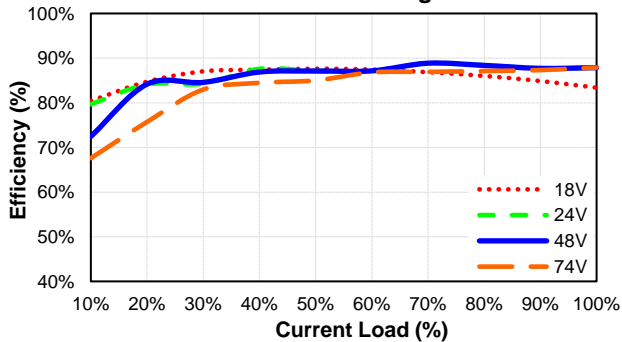
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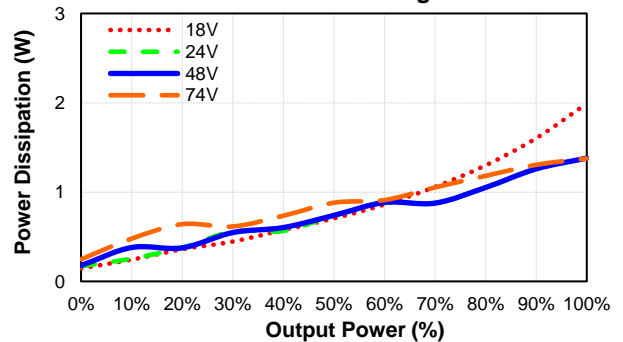
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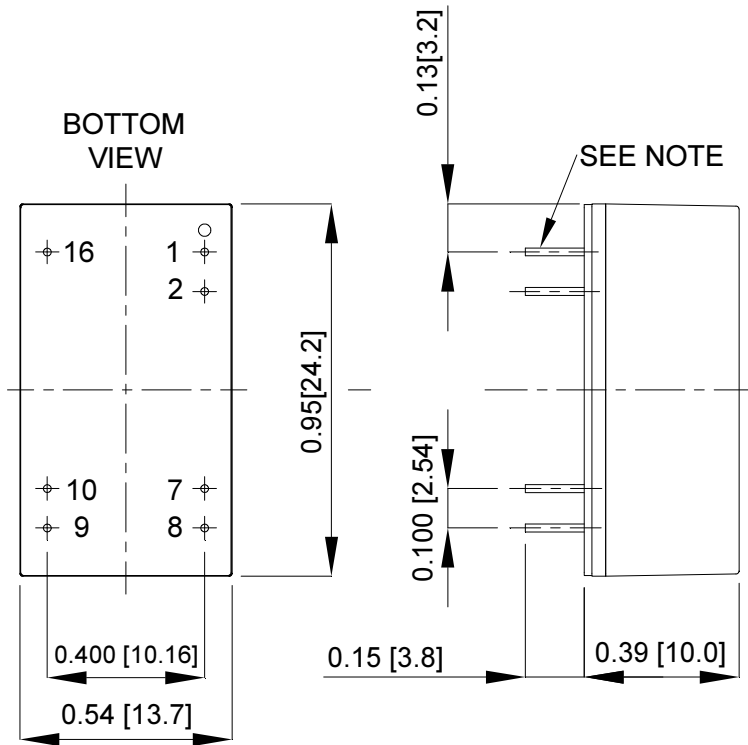
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MECHANICAL SPECIFICATION



NOTE : Pin Size is 0.02±0.002 Inch(0.5±0.05 mm)DIA
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 Output	Dual Output
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

* NC-NO CONNECTION WITH PIN