



EC3SAW SERIES 3 WATT 4:1 INPUT ISOLATED DC-DC CONVERTER

Features

- Efficiency Up to 85%
- Regulated Outputs
- Positive Remote On/Off
- 1500Vdc I/O Isolation
- Continuous Short Circuit Protection
- Input Under Voltage 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		
EC3SAW-24S33P	9-36 VDC	3.3 VDC	0 mA	700 mA	4 mA	122 mA	79	1800uF
EC3SAW-24S05P	9-36 VDC	5 VDC	0 mA	600 mA	4 mA	154 mA	81	1000uF
EC3SAW-24S12P	9-36 VDC	12 VDC	0 mA	250 mA	8 mA	150 mA	84	220uF
EC3SAW-24S15P	9-36 VDC	15 VDC	0 mA	200 mA	12 mA	150 mA	84	120uF
EC3SAW-24D05P	9-36 VDC	±5 VDC	0 mA	±300 mA	8 mA	154 mA	81	470uF
EC3SAW-24D12P	9-36 VDC	±12 VDC	0 mA	±125 mA	12 mA	150 mA	84	100uF
EC3SAW-24D15P	9-36 VDC	±15 VDC	0 mA	±100 mA	12 mA	151 mA	83	47uF
EC3SAW-48S33P	18-75 VDC	3.3 VDC	0 mA	700 mA	3 mA	61 mA	79	1800uF
EC3SAW-48S05P	18-75 VDC	5 VDC	0 mA	600 mA	3 mA	76 mA	82	1000uF
EC3SAW-48S12P	18-75 VDC	12 VDC	0 mA	250 mA	5 mA	74 mA	85	220uF
EC3SAW-48S15P	18-75 VDC	15 VDC	0 mA	200 mA	5 mA	75 mA	84	120uF
EC3SAW-48D05P	18-75 VDC	±5 VDC	0 mA	±300 mA	5 mA	76 mA	82	470uF
EC3SAW-48D12P	18-75 VDC	±12 VDC	0 mA	±125 mA	10 mA	75 mA	84	100uF
EC3SAW-48D15P	18-75 VDC	±15 VDC	0 mA	±100 mA	10 mA	75 mA	83	47uF

NOTE:

1. Nominal input voltage 24 or 48VDC.

PART NUMBER

Series	Nominal Input Voltage	Number of Outputs	Nominal Output Voltage	Remote On/Off Logic
EC3SAW	II	O	XX	Y
EC3SAW	24 : 24VDC 48 : 48VDC	S : Single	33 : 3.3VDC 05 : 5.0VDC 12 : 12VDC 15 : 15VDC	P : Positive
		D : Dual	05 : ±5VDC 12 : ±12VDC 15 : ±15VDC	

Part Number Example:

EC3SAW-24S12P: 3W, 4:1 9-36Vdc Input, Single 12Vdc Output, Positive Logic



EC3SAW Series

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		75	
Input Surge Voltage	100ms max.	24Vin			50	V _{dc}
		48Vin			100	
Operating Ambient Temperature	With de-rating, above 71°C	All	-40		85	°C
Maximum Case Temperature	At the center part of case plate	All			100	°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	75	
Under Voltage Protection						
Turn-On Voltage Threshold		24Vin	7.5			V _{dc}
		48Vin	15.5			
Turn-Off Voltage Threshold		24Vin	6			V _{dc}
		48Vin	12			
Maximum Input Current	V _{in} =9V, Full load	24Vin	427			mA
	V _{in} =18V, Full load	48Vin	213			
No-Load Input Current	V _{in} =24, 48V, I _o =0A	See Model Number Table				mA
Inrush Current (I ² t)	As per ETS300 132-2	All			0.01	A ² s
Input Reflected Ripple Current	P-P thru 12uH inductor, 5Hz to 20MHz	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	-1.5		+1.5	%
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 10% load	Single			±0.5	%
		Dual			±1.0	
Line Regulation	V _{in} =High line to low line, full load	All			±0.5	%
Cross Regulation	Asymmetrical load 25%/100%	Dual			±5	%
Temperature Coefficient	T _c =-40°C to 85°C	All			±0.03	%/°C
Output Voltage Ripple and Noise (5Hz to 20MHz bandwidth)						
Peak-to-Peak	Full load	All			50	mV
Output Current Range	V _{in} = 9 to 36V, 18 to 75V	See Model Number Table				A
Over Current Protection	Foldback mode. Auto recovery Output voltage =90% V _{o nominal}	All	120			%
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				%



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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			±6	%
Recovery Time		All			500	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		1	2	ms
Turn-On Delay Time, From Input	$V_{in_min.}$ to 10% V_{o_set} , Power up	All		1	2	ms
Output Voltage Rise Time	10% V_{o_set} to 90% V_{o_set}	All		1.5	3	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			1500	V_{dc}
Isolation Resistance	Input to output	All	1000			$M\Omega$
Isolation Capacitance	Input to output	All		500		pF

FEATURE CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Switching Frequency	Pulse frequency modulation (PFM)	All	100			KHz
On/Off Control, Positive Remote On/Off Logic, Refer to -Vin Pin						
Logic Low (Module Off)	$V_{on/off}$ at $I_{on/off}=1.0mA$	All	0		1.2	V
Logic High (Module On)	Pin open=on, high impedance	All				
Off Converter Input Current	Shutdown input idle current	All			1	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	Single Dual		2.8 2.1		M hours
Weight		All		4.8		grams
Case Material	Non-conductive black plastic, UL 94V-0					
Potting Material	UL 94V-0					
Pin Material	Base: Copper 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					

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

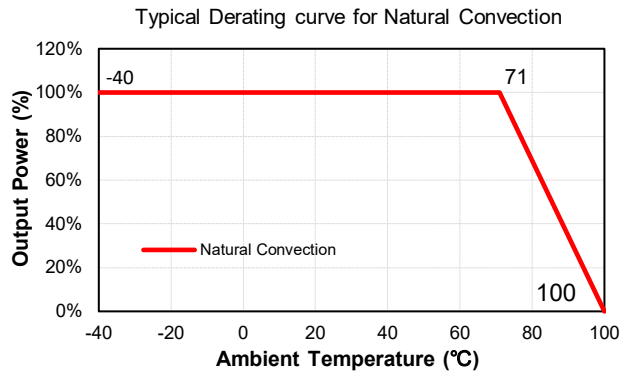
EMI	Meets EN 55032 (with external filter)		Class B
ESD	Meets EN 61000-4-2	Level 2: Air ±8kV, Contact ±4kV	Perf. Criteria A
Radiated Immunity	Meets EN 61000-4-3	Level 2: 80~1000MHz, 3V/m	Perf. Criteria A
Fast Transient	Meets EN 61000-4-4	Level 2: On power input port, ±0.5kV, external input TVS required	Perf. Criteria A
Surge	Meets EN 61000-4-5	Level 2: Line to line, ±0.5kV, external input TVS required	Perf. Criteria A
Conducted Immunity	Meets EN 61000-4-6	Level 2: 0.15~80MHz, 3V	Perf. Criteria A
Magnetic Field Immunity	Meets EN 61000-4-8	Level 2: 50 or 60Hz, 3A/m (rms)	Perf. Criteria A
Application Note Link			EC3SAW Series App Notes
Packaging Information Link			Packaging Information



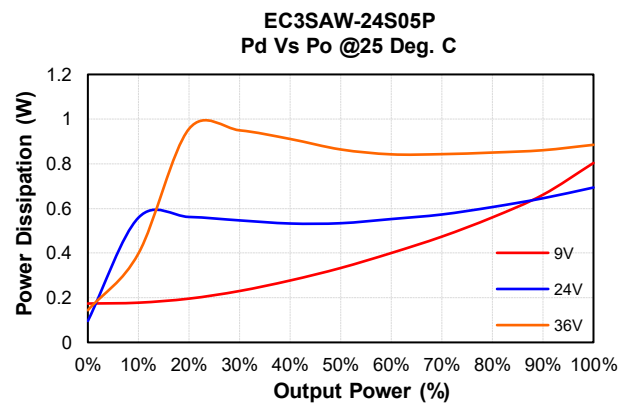
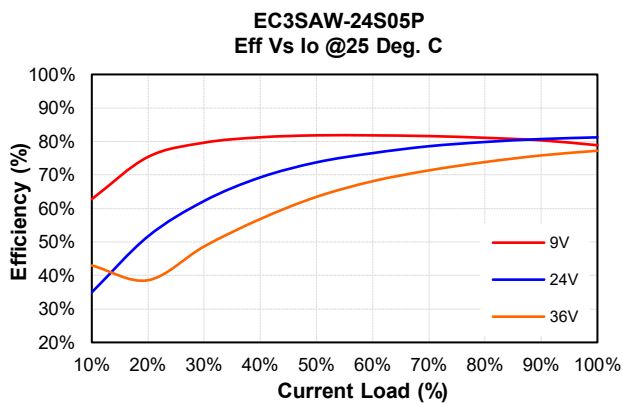
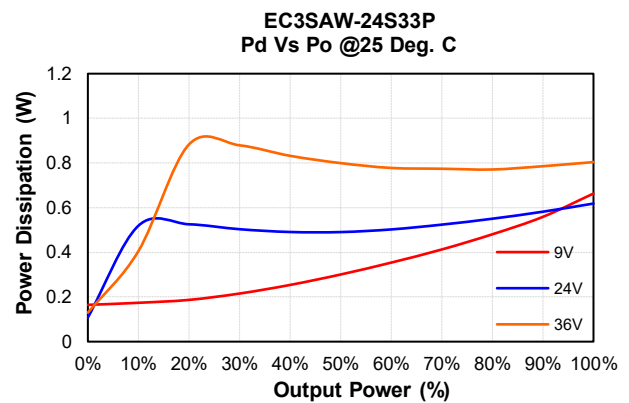
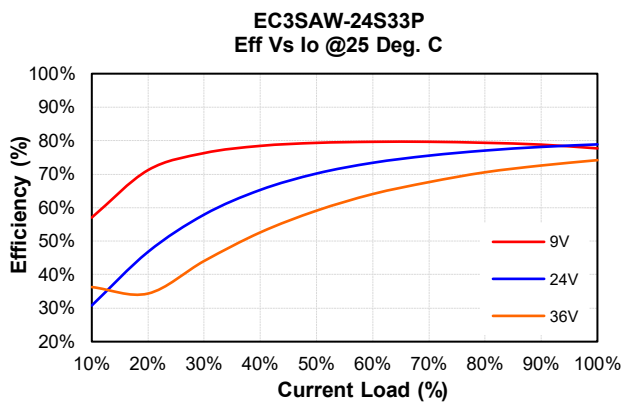
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CHARACTERISTIC CURVE

Power Derating Curve



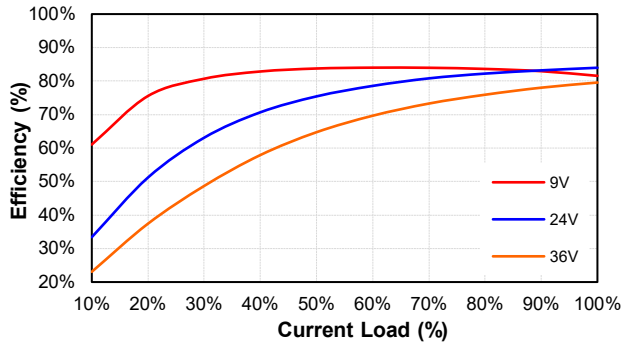
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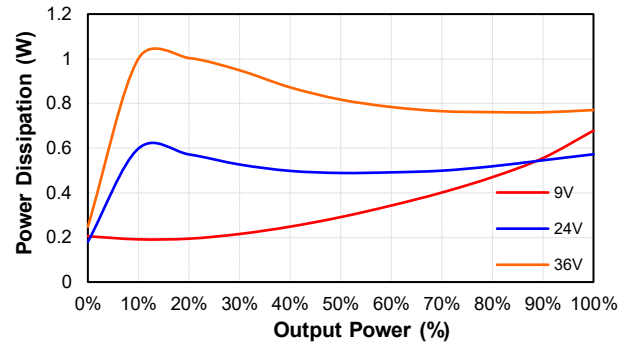


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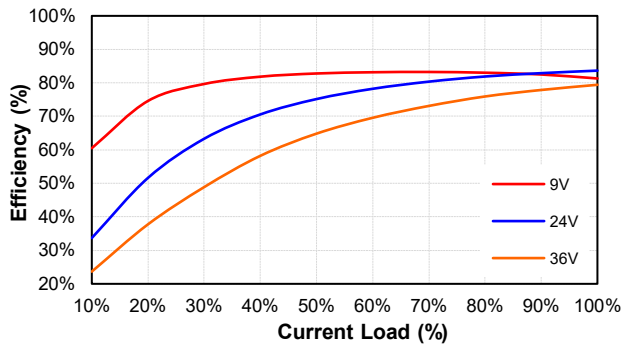
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Eff Vs Io @25 Deg. C



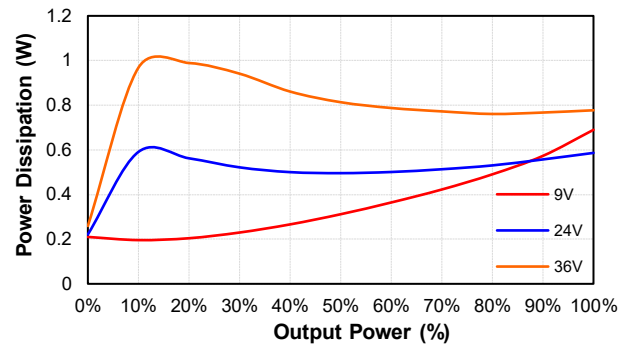
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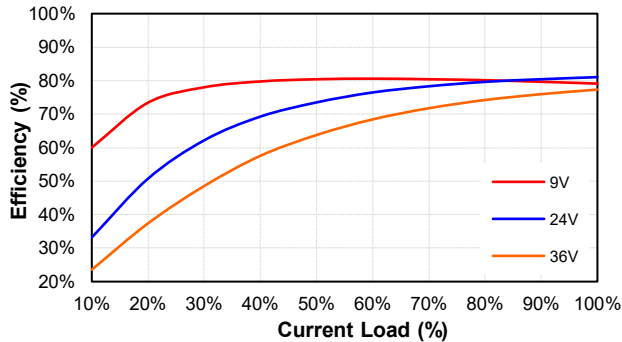
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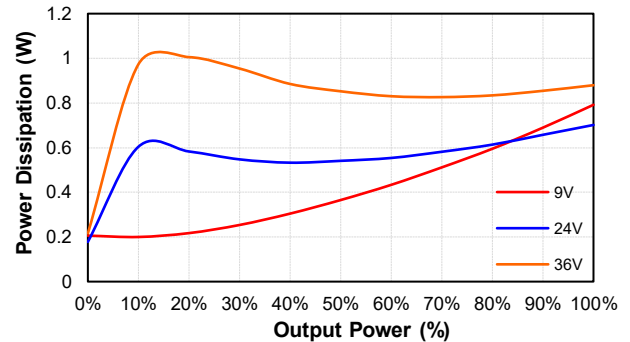
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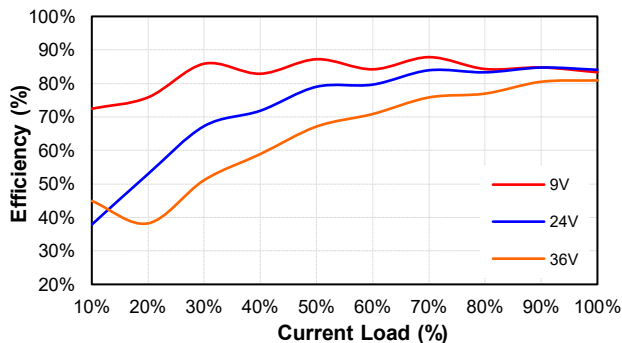
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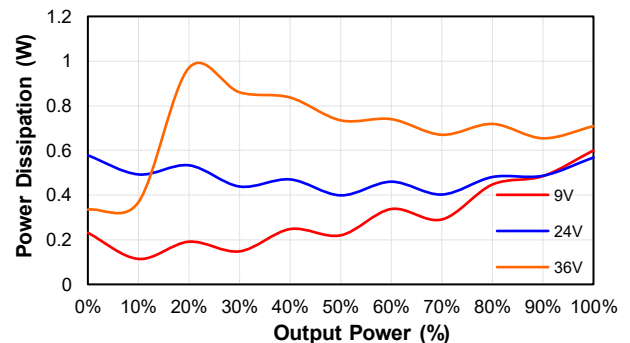
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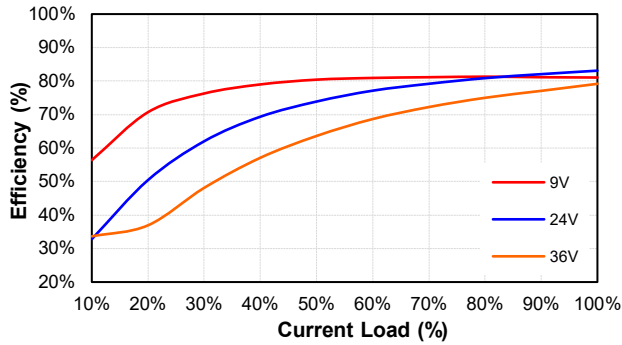
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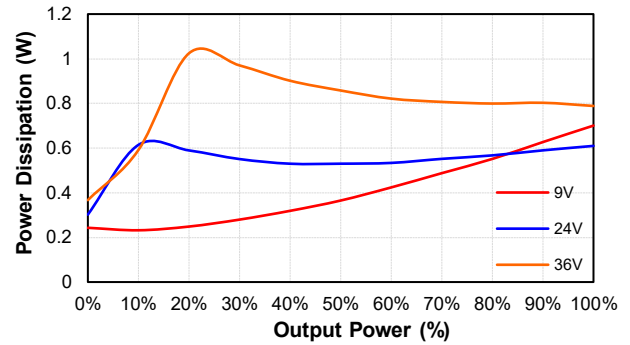


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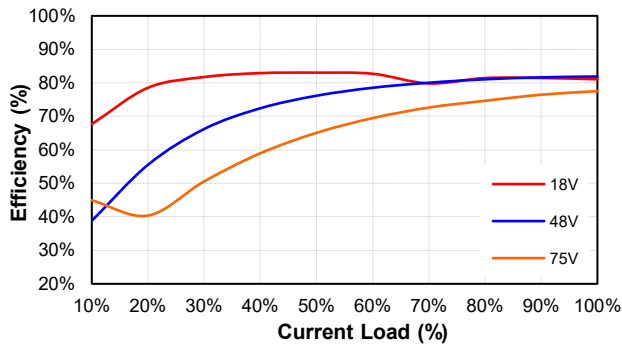
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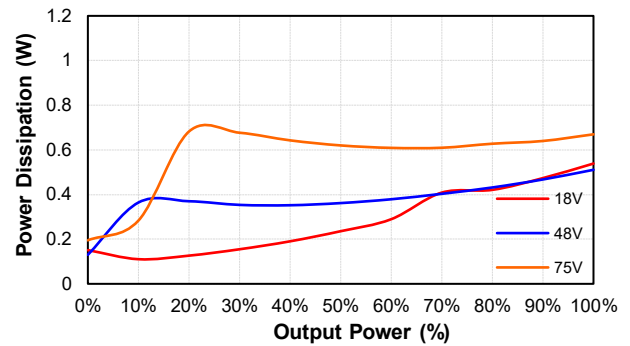
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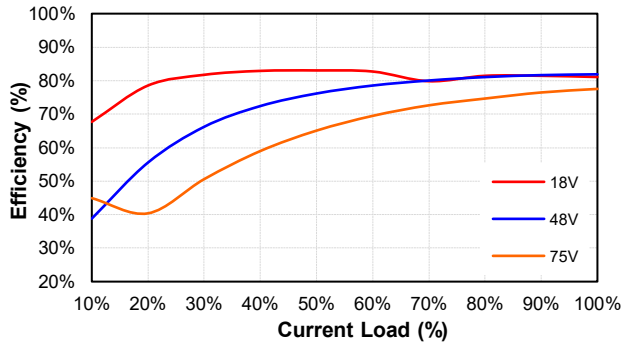
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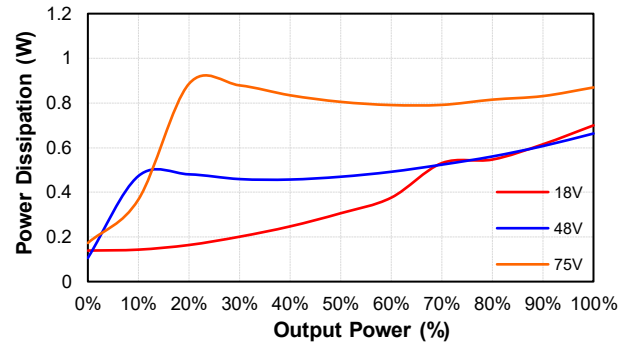
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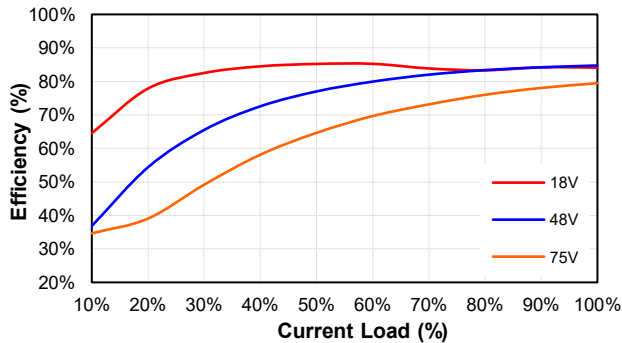
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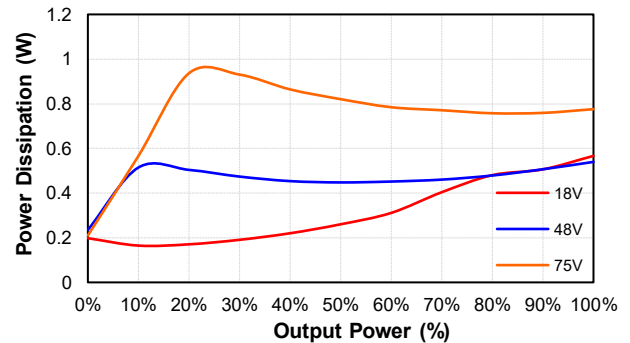
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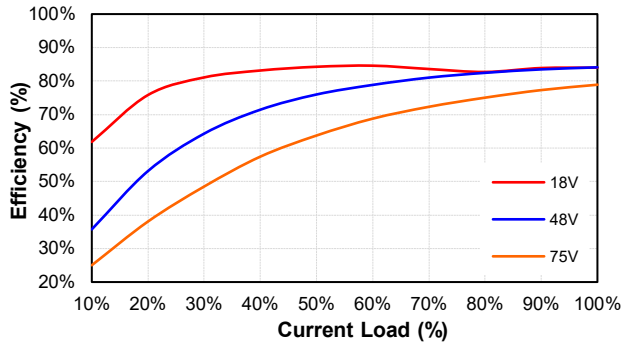
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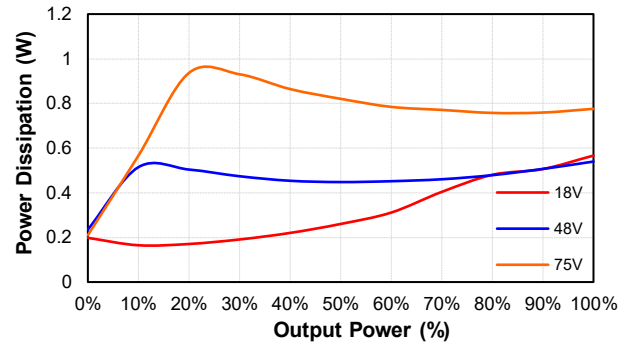


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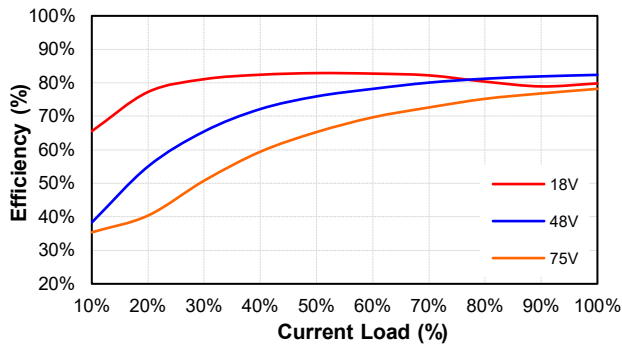
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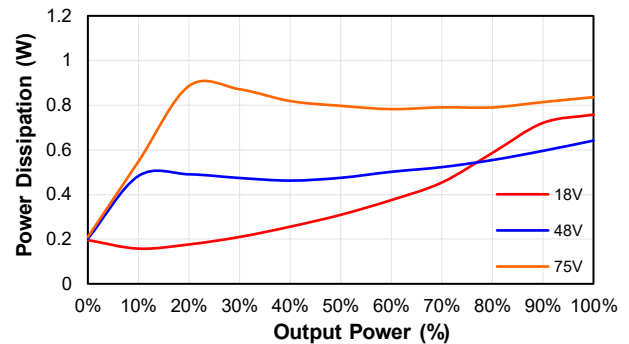
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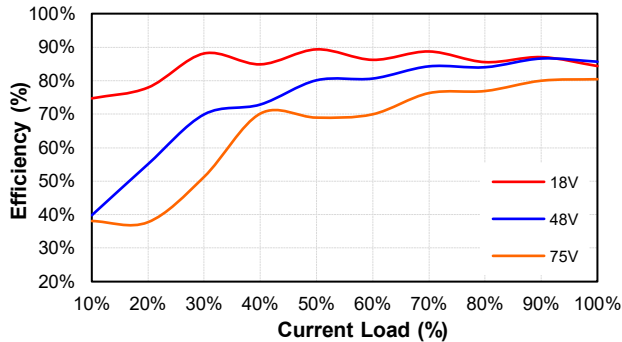
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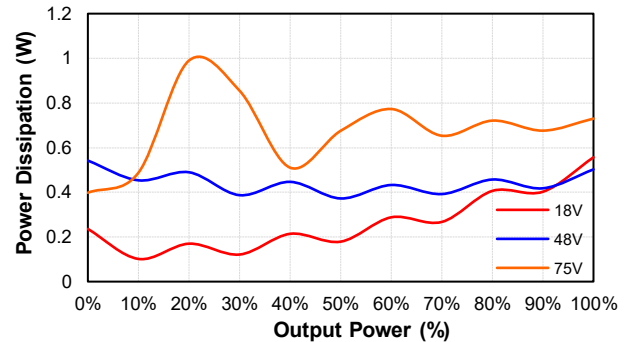
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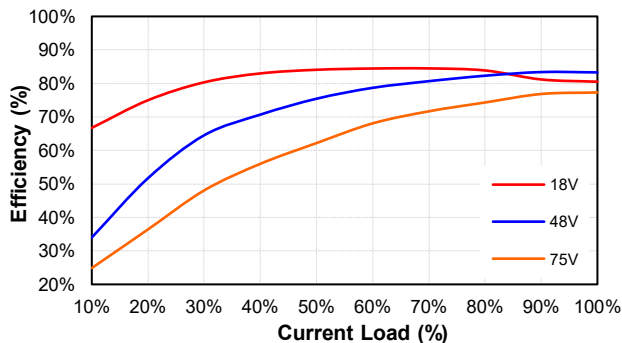
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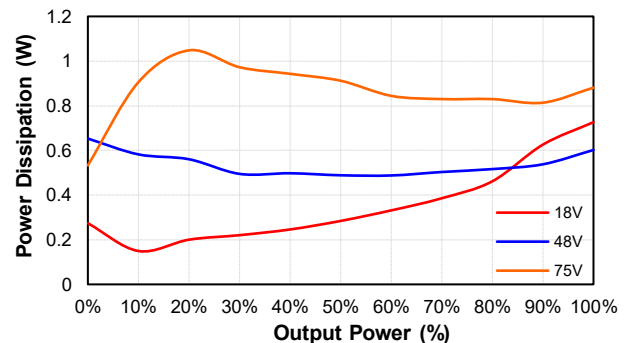
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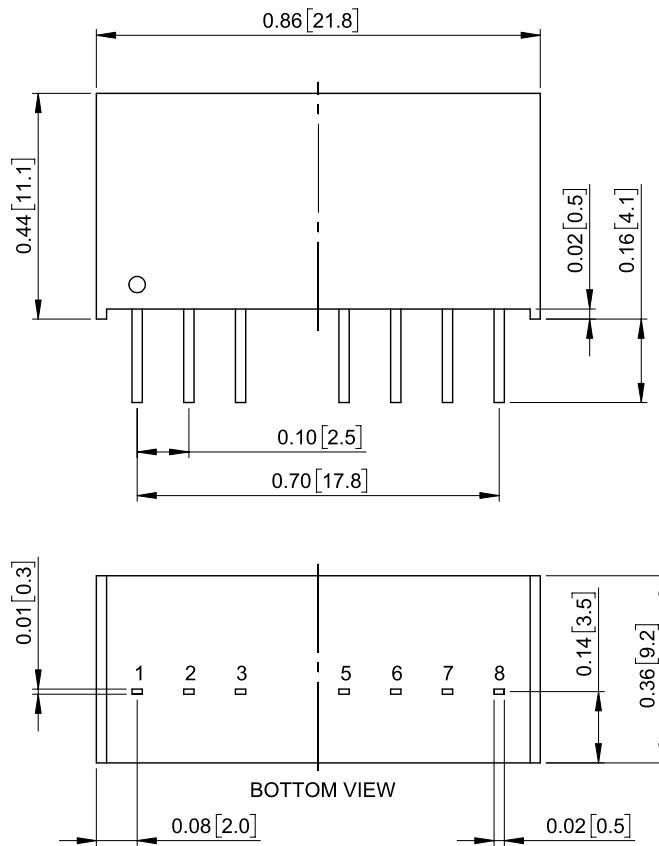
EC3SAW-48D15P
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EC3SAW Series

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	+V Input	+V Input
3	On/Off	On/Off
5	NC	NC
6	+V Output	+V Output
7	-V Output	Common
8	NC	-V Output

NC:NO CONNECTION WITH PIN

Note:Pin Size is x.xx±0.002 Inch [x.x±0.05mm]