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EC4SAW8 SERIES 6 WATT 8:1 INPUT ISOLATED DC-DC CONVERTER

Features

- Efficiency up to 88%
- Fixed Switching Frequency
- Negative Remote On/Off
- Low No Load Power Consumption
- Fully Protected (OCP/UVLO)
- 3000Vdc I/O Isolation
- Safety Meets IEC/EN/UL 62368-1
- 5000m Operating Altitude



MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT		INPUT CURRENT 48V _{in} (TYP.)		% EFF (TYP.)			CAPACITOR LOAD MAX.
			MIN.	MAX.	NO LOAD	FULL LOAD	12V _{in}	24V _{in}	48V _{in}	
EC4SAW8-48S33N	9-75 VDC	3.3 VDC	0 mA	1500 mA	4 mA	131 mA	79	80	80	1500uF
EC4SAW8-48S05N	9-75 VDC	5 VDC	0 mA	1200 mA	4 mA	153 mA	83	84	83	1200uF
EC4SAW8-48S12N	9-75 VDC	12 VDC	0 mA	500mA	5 mA	145 mA	87	88	88	560uF
EC4SAW8-48S15N	9-75 VDC	15 VDC	0 mA	400 mA	5 mA	145 mA	87	88	88	470uF
EC4SAW8-48D05N	9-75 VDC	±5 VDC	0 mA	±600 mA	5 mA	151 mA	83	83	83	680uF
EC4SAW8-48D12N	9-75 VDC	±12 VDC	0 mA	±250 mA	5 mA	145 mA	86	87	86	330uF
EC4SAW8-48D15N	9-75 VDC	±15 VDC	0 mA	±200 mA	5 mA	147 mA	86	87	86	220uF

NOTE:

1. Nominal input voltage 12V_{dc} or 24V_{dc} or 48V_{dc}.

PART NUMBER

Series	Nominal Input Voltage	Number of Outputs	Nominal Output Voltage	Remote On/Off Logic
EC4SAW8-	II	O	XX	X
EC4SAW8	48 : 48 VDC	S : Single D : Dual	33 : 3.3VDC 05 : 5.0VDC 12 : 12VDC 15 : 15VDC 05 : ±5 VDC 12 : ±12 VDC 15 : ±15 VDC	N : Negative

Part Number Example:

EC4SAW8-48S12N: 6W, 8:1 9-75Vdc 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	All	-0.3		75	V _{dc}
Input Surge Voltage	100ms max.	All			100	V _{dc}
Operating Temperature	With de-rating, above 61°C	3.3Vo 5Vo ±5Vo	-40		105	°C
	With de-rating, above 65°C	Others				
Maximum Case Temperature	At the center part of case plate	All	-40		120	°C
Storage Temperature		All	-55		125	°C

INPUT CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Operating Input Voltage		All	9	48	75	V _{dc}
Input Under Voltage Lockout						
Turn-On Voltage Threshold	100% Load	All	7.6	8.1	8.8	V _{dc}
Turn-Off Voltage Threshold	100% Load	All	7.0	7.5	8.0	V _{dc}
Lockout Hysteresis Voltage	100% Load	All		0.6		V _{dc}
Maximum Input Current	V _{in} =9V _{dc} , Full load	All		820		mA
No-Load Input Current	V _{in} =48V _{dc} , I _o =0A	See Model Number Table				mA
Input Filter	Capacitive	All				
Inrush Current (I _{2t})	As per ETS300 132-2	All			0.1	A ² s
Input Reflected Ripple Current	V _{in} =Nominal, L=12uH, Load=Full load	All		30		mA

OUTPUT CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Voltage Set Point Accuracy	V _{in} =48V _{dc} , Full load, T _c =25°C	All	-1.5		+1.5	%
Output Voltage Balance	V _{in} =48V _{dc} , Full load, T _c =25°C	±5Vo	-2.0		+2.0	%
		Others	-1.0		+1.0	
Output Voltage Regulation						
Load Regulation	Full load to no load	Single Dual			±0.5 ±1.0	%
Line Regulation	V _{in} =High line to low line, full load	All			±0.5	
Cross Regulation	Asymmetrical load 25%/100%	Dual			±5.0	%
Temperature Coefficient	T _c =-40°C to 61°C	3.3Vo 5Vo ±5Vo	±0.03			% / °C
	T _c =-40°C to 65°C	Others				
Output Voltage Ripple and Noise (20MHz bandwidth)						
Peak-to-Peak	Full load, T _c =25°C 1uF ceramic capacitor	All			100	mV
Output Current Range	V _{in} = 9 to 75V _{dc}	See Model Number Table				A
Over Current Protection	Hiccup mode. Auto recovery	All	110		230	%
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 _{dc} , 24V _{dc} , 48V _{dc}	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			± 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		10		ms
Turn-On Delay Time, From Input	$V_{in_min.}$ to 10% V_{o_set} , Power up	All		10		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			$M\Omega$
Isolation Capacitance	Input to output	All		1000		pF

FEATURE CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Switching Frequency	Pulse width modulation (PWM), fixed	All		470		KHz
On/Off Control, Negative Remote On/Off Logic, Refer to $-V_{in}$ Pin						
Logic High (Module Off)	$V_{on/off}$ at $I_{on/off}$	All	5.5		15	V_{dc}
Logic Low (Module On)	$< 1.2V_{dc}$ and open circuit	All	0		1.2	V_{dc}
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	3.3Vo		3540		K hours
		5Vo		3083		
		12Vo		3558		
		15Vo		3387		
		$\pm 5Vo$		2905		
		$\pm 12Vo$		3268		
		$\pm 15Vo$		2956		
Weight		All		4.8		grams
Case Material	Non-conductive black plastic, UL 94V-0					
Potting Material	UL 94V-0					
Pin Material	Base: Copper Plating: Nickel and Bright Tin					
Shock/Vibration	MIL-STD-810F Compliant					
Humidity	95% RH max. Non condensing					
Altitude	5000m Operating altitude, 12000m Transport altitude					
Thermal Shock	MIL-STD-810F					

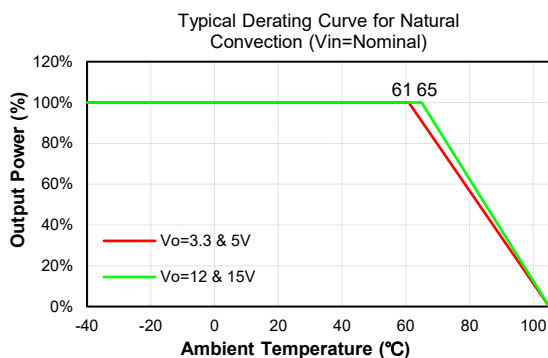
EC4SAW8 Series

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

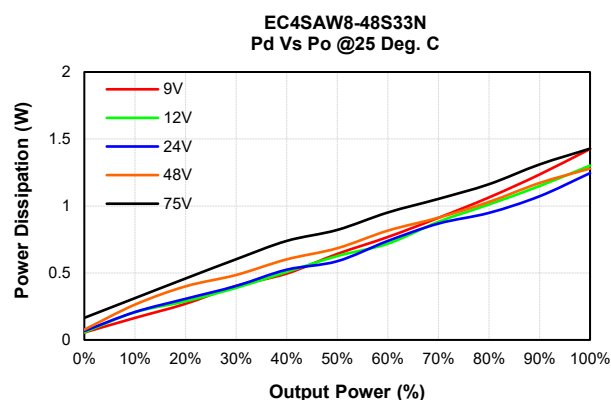
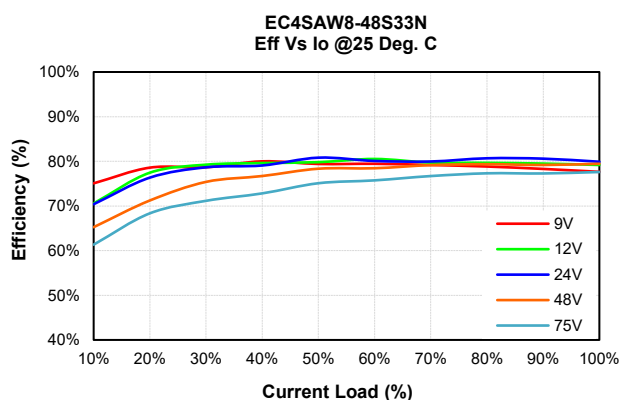
EMI	Meets EN 55032 Class A & Class B (with external filter)		
ESD	Meets EN 61000-4-2	Level 2: Air $\pm 8\text{kV}$, Contact $\pm 4\text{kV}$	Perf. Criteria A
Radiated Immunity	Meets EN 61000-4-3	Level 2: 80~1000MHz, 3V/m	Perf. Criteria A
Fast Transient	Meets EN 61000-4-4	Level 2: On power input port, $\pm 0.5\text{kV}$, external input capacitor required	Perf. Criteria A
Surge	Meets EN 61000-4-5	Level 2: Line to line, $\pm 0.5\text{kV}$, 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			EC4SAW8 Series App Notes
Packaging Information Link			Packaging Information

CHARACTERISTIC CURVE

Power Derating Curve

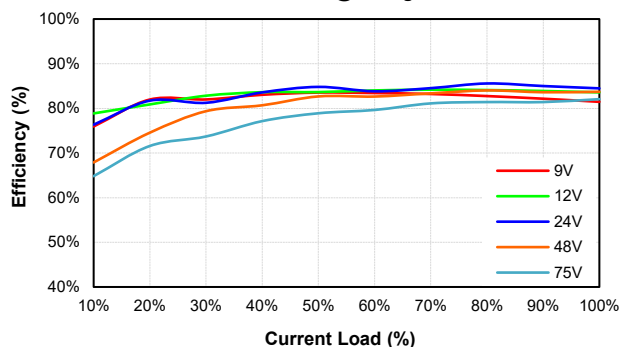


Performance Data

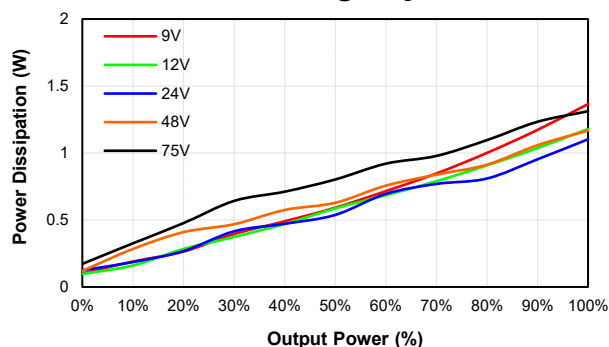


EC4SAW8 Series

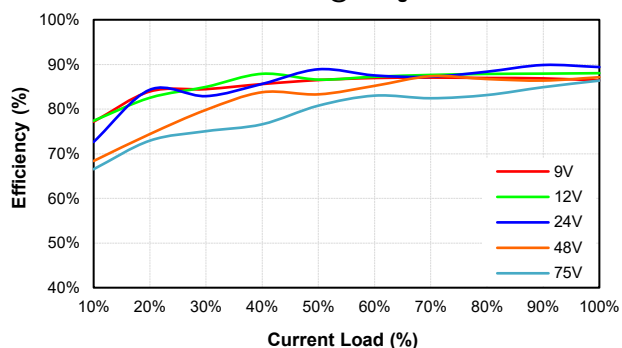
EC4SAW8-48S05N
Eff Vs Io @25 Deg. C



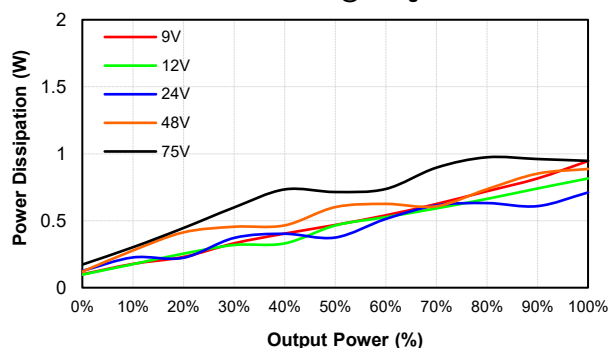
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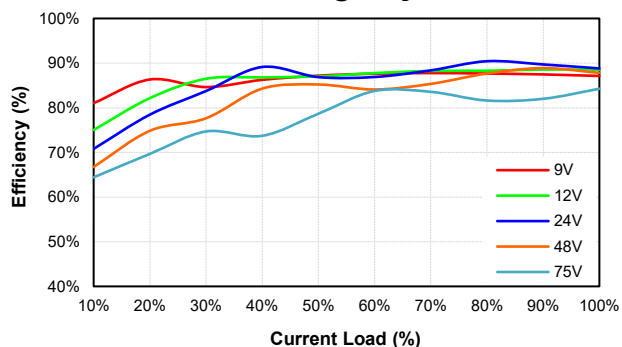
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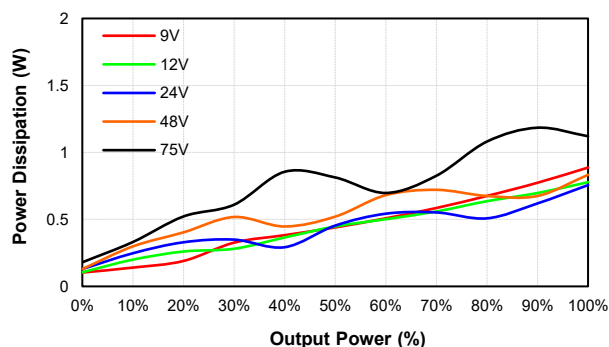
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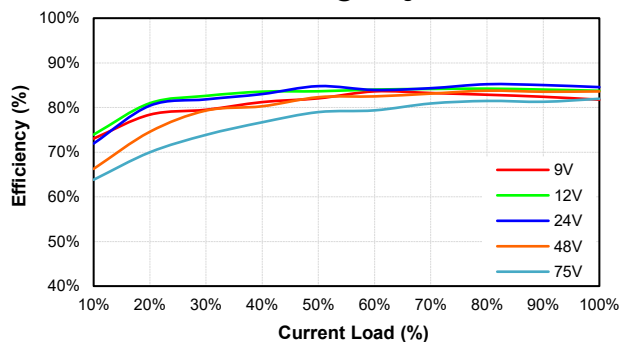
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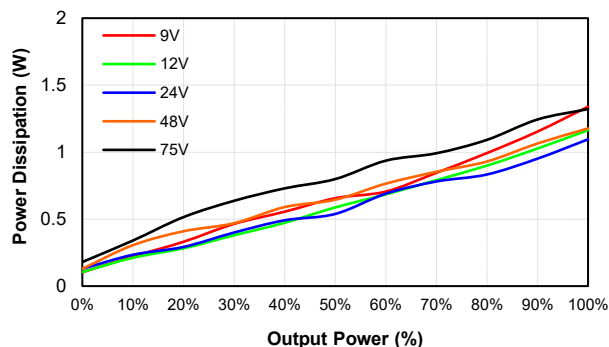
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Pd Vs Po @25 Deg. C



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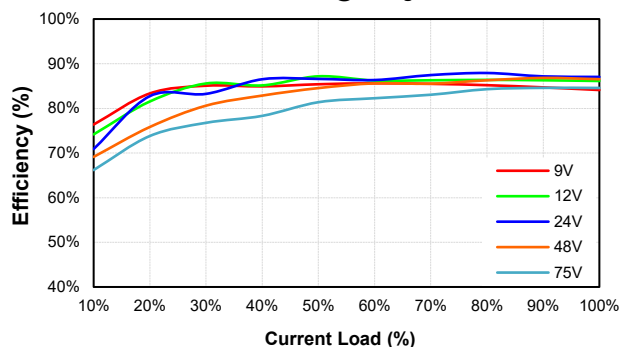


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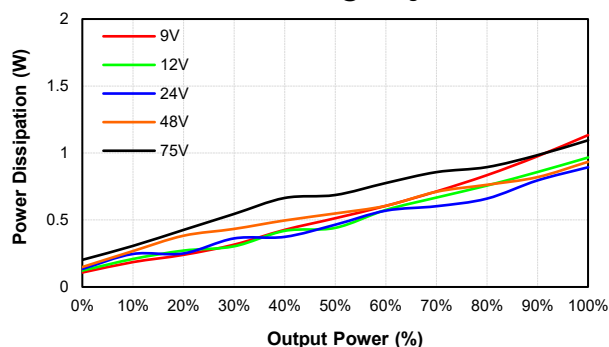


EC4SAW8 Series

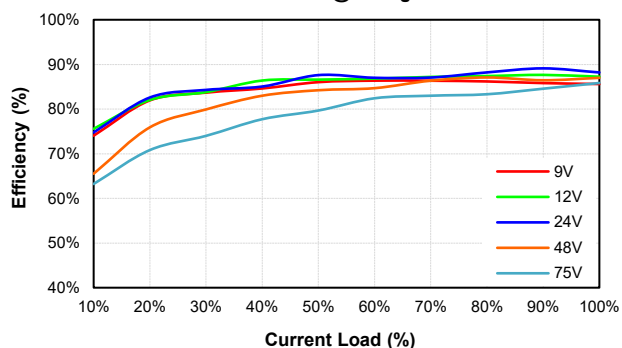
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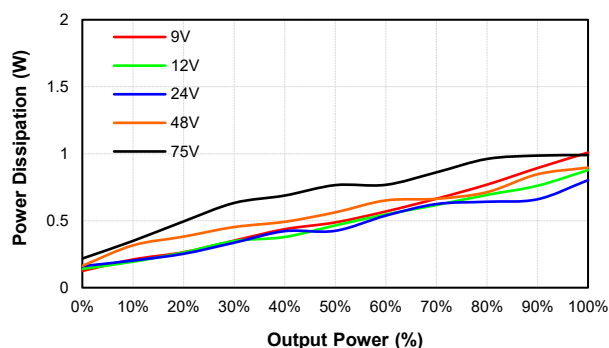
EC4SAW8-48D12N
Pd Vs Po @25 Deg. C



EC4SAW8-48D15N
Eff Vs Io @25 Deg. C

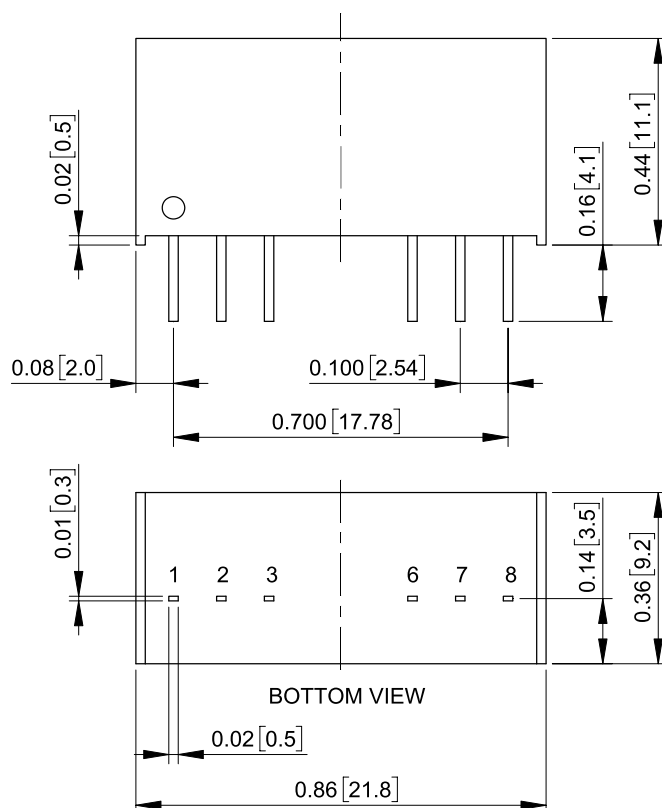


EC4SAW8-48D15N
Pd Vs Po @25 Deg. C





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
6	+V Output	+V Output
7	-V Output	Common
8	NC	-V Output

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

NC-No Connection with Pin