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℃ 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℃	3.3Vo 5Vo ±5Vo	-40		105	℃
	With de-rating, above 65℃	Others				
Maximum Case Temperature	At the center part of case plate	All	-40		120	℃
Storage Temperature		All	-55		125	℃

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^2s
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℃	All	-1.5		+1.5	%
Output Voltage Balance	V_{in}=48V_{dc}, Full load, T_c=25℃	±5Vo Others	-2.0 -1.0		+2.0 +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℃ to 61℃	3.3Vo 5Vo ±5Vo		±0.03		%/℃
	T_c=-40℃ to 65℃	Others				
Output Voltage Ripple and Noise (20MHz bandwidth)						
Peak-to-Peak	Full load, T_c=25℃ 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 d_i/d_t=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			MΩ
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} or open circuit	All	0		1.2	V_{dc}
Off Converter Input Current	Shutdown input idle current	All			1	mA

GENERAL SPECIFICATIONS

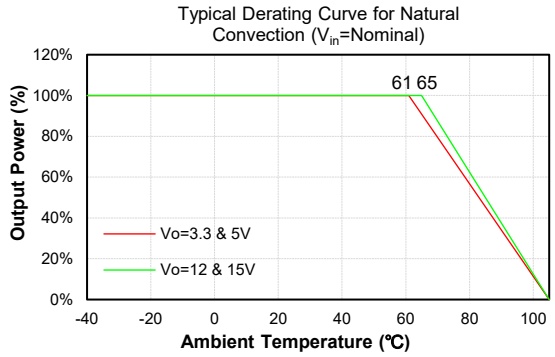
PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
MTBF	I_o=100% of $I_{o\_max.}$; MIL-HDBK - 217F_Notice 1, GB, 25℃	3.3Vo 5Vo 12Vo 15Vo ±5Vo ±12Vo ±15Vo		3540 3083 3558 3387 2905 3268 2956		K hours
Weight		All		4.8		grams
Case Material	Non-conductive black plastic, UL 94V-0					
Potting Material	UL 94V-0					
Pin Material	Base: Copper Plating: 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					

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 ±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 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			EC4SAW8 Series App Notes
Packaging Information Link			Packaging Information

CHARACTERISTIC CURVE

Power Derating Curve



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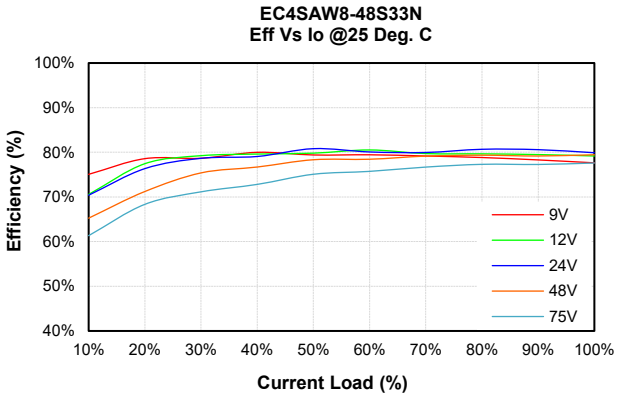
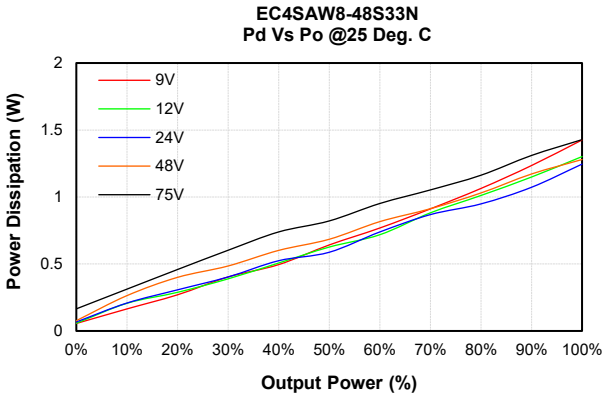
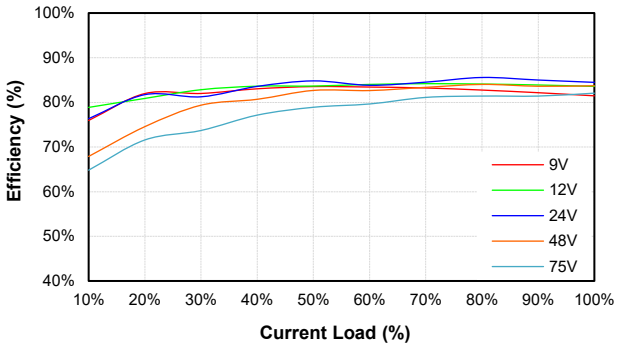




EC4SAW8-48S05N
Eff Vs Io @25 Deg. C



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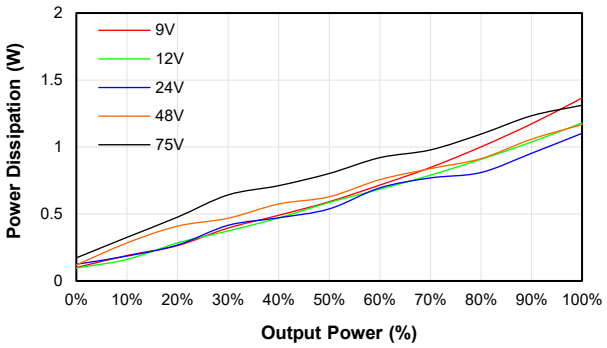

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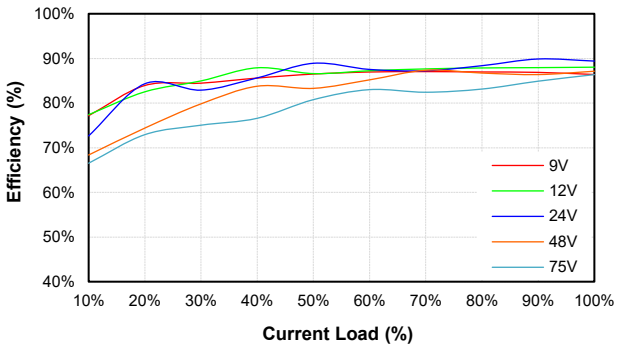

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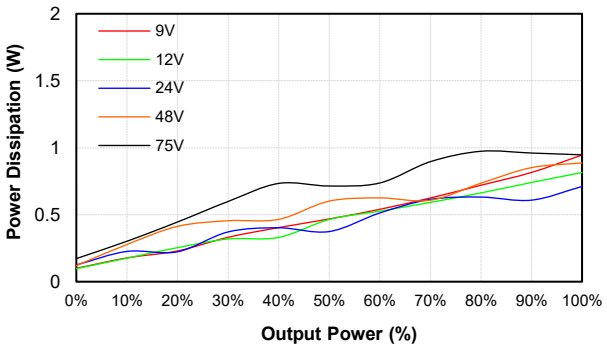

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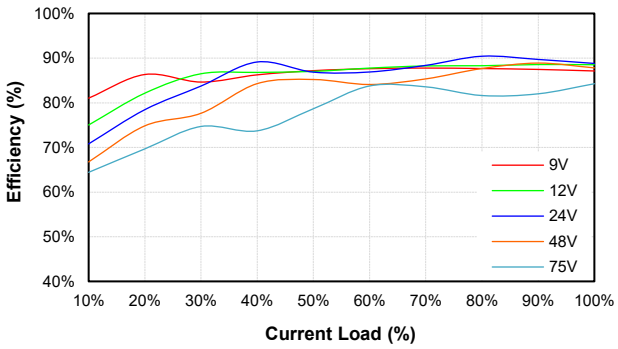

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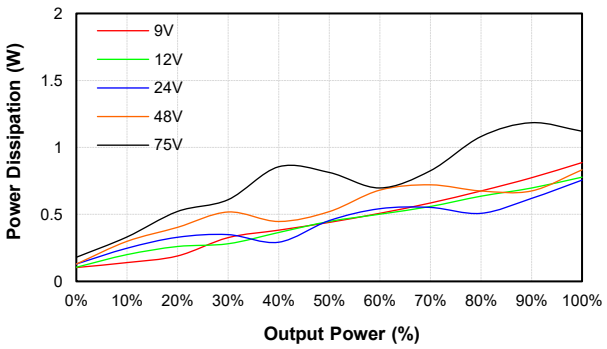

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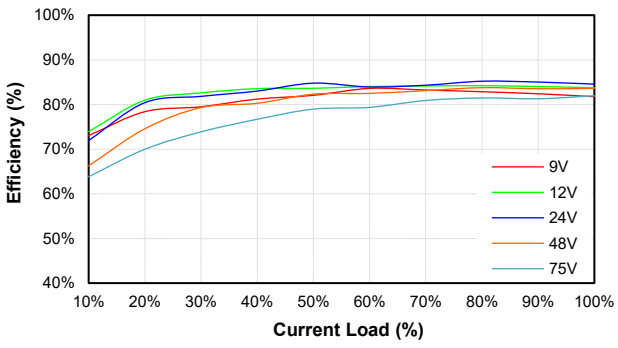

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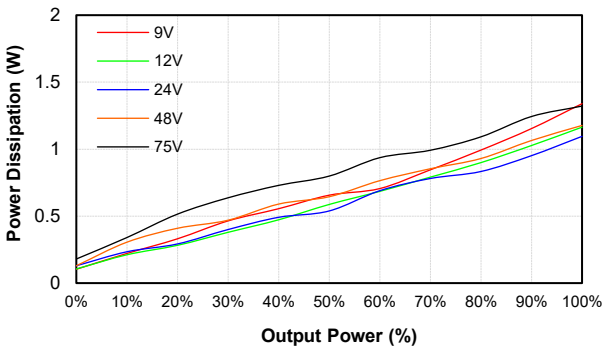

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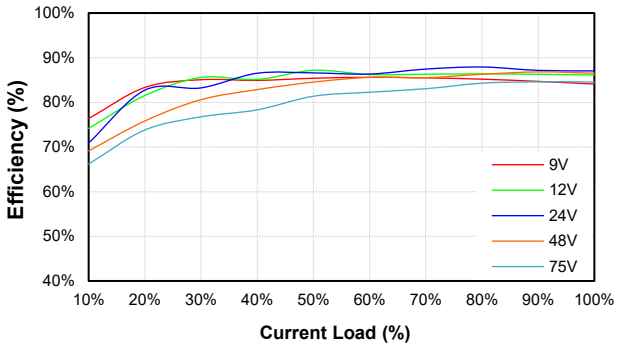

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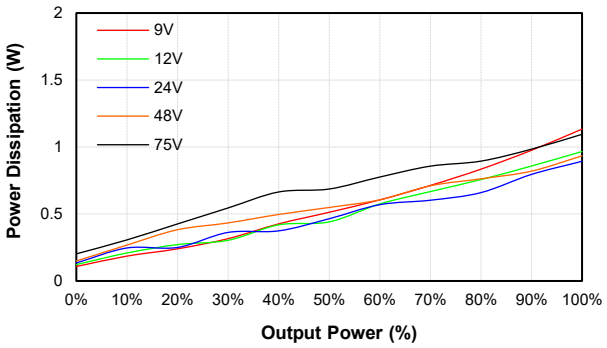

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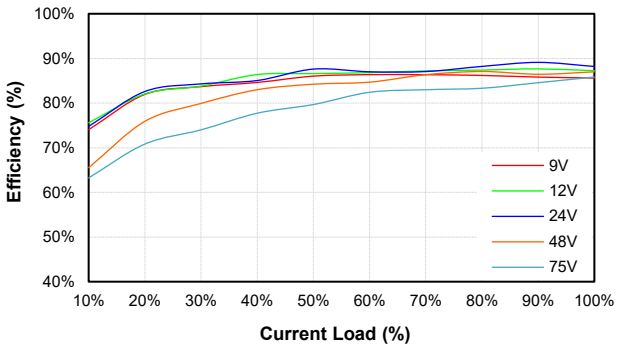

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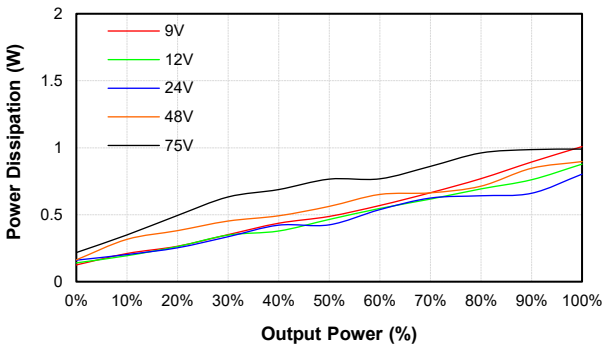
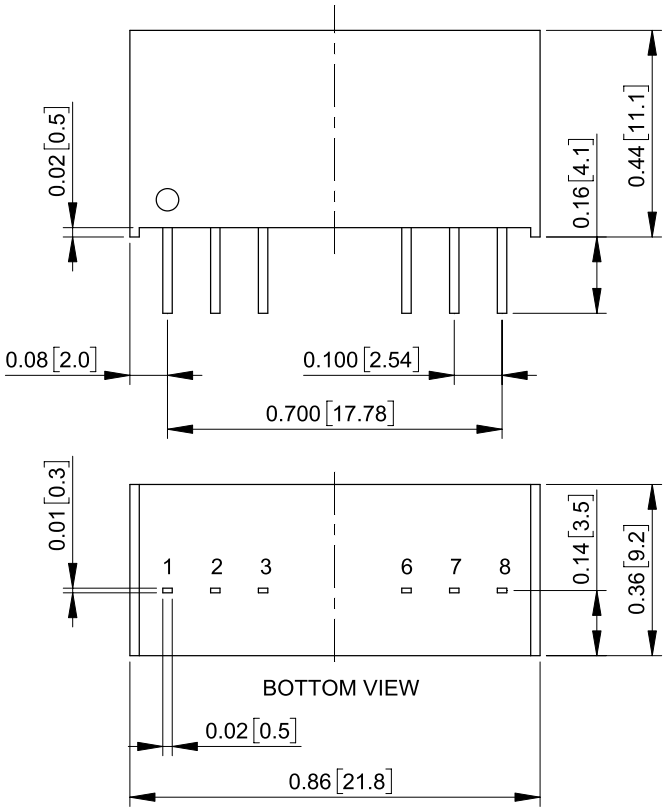


MECHANICAL SPECIFICATION



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	+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

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