EC7AW18 SERIES
10 WATT 18:1 INPUT ISOLATED DC-DC CONVERTER

Features

- Efficiency up to 88%
- Fixed Switching Frequency
- Regulated Outputs
- Remote On/Off
- Low No Load Power Consumption
- Fully protected (OCP/OVP/UVLO)
- 3000Vac I/O Isolation
- Operating Ambient Temperature -40 to +100℃
- 1.25”x0.8”x0.5” Size Meet Industrial Standard
- CB Test Certificate IEC62368-1
- EN55032/EN55035/EN50155 Compliant with External Circuits
- UL62368-1 3rd (Reinforced Insulation) Approval
- Shock & Vibration EN50155 (EN61373) Compliant
- Fire & Smoke EN45545-2 Compliant
- 5000m Operating Altitude

E176177

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT		INPUT CURRENT		% EFF.		CAPACITOR LOAD MAX.
			MIN.	MAX.	NO LOAD	FULL LOAD	(1)	(2)	
EC7AW18-72S05	8.5-160 VDC	5 VDC	0 mA	2000 mA	6 mA	166 mA	84	82	2000μF
EC7AW18-72S12	8.5-160 VDC	12 VDC	0 mA	835 mA	6 mA	158 mA	88	85	835μF
EC7AW18-72S15	8.5-160 VDC	15 VDC	0 mA	668 mA	6 mA	158 mA	88	85	668μF
EC7AW18-72D05	8.5-160 VDC	±5 VDC	0 mA	±1000 mA	6 mA	168 mA	83	82	1000μF
EC7AW18-72D12	8.5-160 VDC	±12 VDC	0 mA	±416 mA	6 mA	160 mA	87	85	416μF
EC7AW18-72D15	8.5-160 VDC	±15 VDC	0 mA	±333 mA	6 mA	160 mA	87	85	333μF

NOTE:

1. Nominal Input Voltage 72 VDC.
2. Measured at 110Vin.
3. To meet EN50155 and RIA12 refer to application note.

PART NUMBER

Series	Nominal Input Voltage	Number of Outputs	Nominal Output Voltage	Remote On/Off Logic
EC7AW18-	II	O	XX	
EC7AW18	72： 72 VDC	S：Single D：Dual	05：5.0VDC 12：12VDC 15：15VDC 05：±5 VDC 12：±12 VDC 15：±15 VDC	Positive

Part Number Example:

EC7AW18-72S12: 1.25”x0.8”, 10W, 18:1 8.5-160Vdc Input, Single 12Vdc Output, Positive 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		160	V_{dc}
Input Surge Voltage	100ms max.	All			200	V_{dc}
Operating Ambient Temperature	With derating	All	-40		100	℃
Maximum Case Temperature	At the center part of case plate	All			100	℃
Storage Temperature		All	-55		125	℃

INPUT CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Operating Input Voltage		All	8.5	72	160	V_{dc}
Input Under Voltage Lockout						
Turn-On Voltage Threshold	80% Load	All	8.2	9	9.5	V_{dc}
Turn-Off Voltage Threshold	80% Load	All	6.9	7.5	8.0	V_{dc}
Lockout Hysteresis Voltage	80% Load	All		1.5		V_{dc}
Maximum Input Current	V_{in}=12V, Full load	All			1.3	A
	V_{in}=8.5V, 80% load					
No-Load Input Current	V_{in}=72V, Io=0A	See Model Number Table				mA
Input Filter	LC filter.	All				
Inrush Current (I^2t)	As per ETS300 132-2	All			0.1	A^2s
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}=72V, Full load, Tc=25℃	All	-1.0		+1.0	%
Output Voltage Balance	V_{in}=72V, Full load, Tc=25℃	Dual	-1.0		+1.0	%
Output Voltage Regulation						
Load Regulation	Full load to no load	Single			±0.5	%
		Dual			±1.0	
Line Regulation	V_{in}=High line to low line, full load	All			±0.2	%
Cross Regulation	Load cross variation 25%/100%	Dual			±5.0	%
Temperature Coefficient	Tc=-40℃ to 100℃	All			±0.02	%/℃
Output Voltage Ripple and Noise (5Hz to 20MHz bandwidth)						
Peak-to-Peak	Full load, 2.2uF ceramic capacitors.	All			100	mV
RMS.		All			40	mV
Output Current Range	V_{in}= 8.5 to 12V	See Power Derating Curve				A
	V_{in}= 12 to 160V	See Model Number Table				
Over Current Protection	Hiccup mode. Auto recovery	All	110	150	180	%
Short Circuit Protection		All	Continuous, Auto Recovery.			
External Load Capacitance	Full load (resistive)	See Model Number Table				uF
Over Voltage Protection	Zener clamp (single output only)	5Vo		6.2		V_{dc}
		12Vo		15		
		15Vo		18		

EFFICIENCY

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
100% Load	Vin=72V, 110V	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% Vout 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		5		ms
Turn-On Delay Time, From Input	V_{in_min} to 10%V_{o_set}, Power up	All		5		ms
Output Voltage Rise Time	10%V_{o_set} to 90%V_{o_set}	All		10		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 4200	V_{ac} V_{dc}
Isolation Resistance	Input to output	All	1000			MΩ
Isolation Capacitance	Input to output (100KHz, 0.25V)	All		16		pF

FEATURE CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Switching Frequency	Output ripple frequency	All	230	255	280	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)	$V_{on/off}$ at $I_{on/off}$=0.0uA, Pin open=On	All	3.5 or Open Circuit		160	V
On/Off Current (for both remote on/off logic)	$I_{on/off}$ at $V_{on/off}$=0V	All		0.4	1	mA
Leakage Current (for both remote on/off logic)	Logic high, $V_{on/off}$=15V	All			30	uA
Off Converter Input Current	Shutdown input idle current	All		1.5	3	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℃	5Vo 12Vo 15Vo ±5Vo ±12Vo ±15Vo		1654 2295 2363 1664 2093 2335		K hours
Weight		All		16		grams
Case Material	Plastic, DAP, UL 94V-0					
Base Material	Plastic, LCP, UL 94V-0					
Potting Material	UL 94V-0					
Pin Material	Base: Copper plated steel wire Plating: Tin					

GENERAL SPECIFICATIONS

Shock/Vibration	MIL-STD-810F/EN61373 Compliant		
Humidity	95% RH max. Non Condensing		
Altitude	5000m Operating Altitude, 12000m Transport Altitude		
Thermal Shock	MIL-STD-810F		
Fire & Smoke	EN45545-2 Compliant		
EMI	EN55032 & EN50155 Compliant (with external filter)		Class A
ESD	EN61000-4-2	Level 3: Air ±8kV, Contact ±6kV	Perf. Criteria A
Radiated immunity	EN61000-4-3	Level 3: 80~1000MHz, 20V/m	Perf. Criteria A
Fast Transient	EN61000-4-4	Level 3: On power input port, ±2kV, external input capacitor required	Perf. Criteria A
Surge	EN61000-4-5	Level 4: Line to earth, ±4kV, Line to line, ±2kV (EN50155) Level 3: Line to earth, ±2kV, Line to line, ±1kV (EN55035)	Perf. Criteria A
Conducted immunity	EN61000-4-6	Level 3: 0.15~80MHz, 10V	Perf. Criteria A
Interruptions of Voltage Supply	EN50155	Class S3: 20ms interruptions	Perf. Criteria A
Supply Change Over	EN50155	Class C2: During a supply break of 30ms	Perf. Criteria A
Application Note Link			EC7AW18-72 Series App Notes
Packaging Information Link			Packaging Information

Immunity to Environmental Conditions

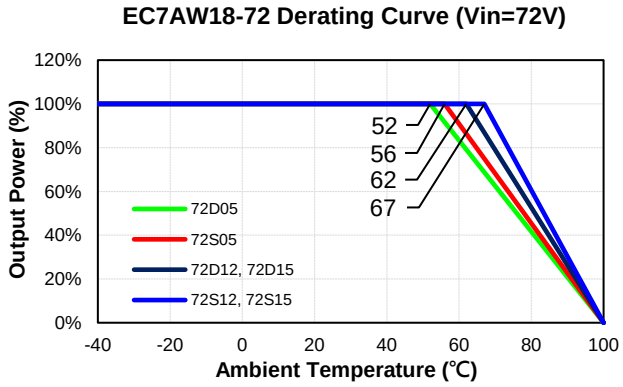
Phenomenon	EN50155; 2017 Reference Clause(s)	Reference Standard	Test Conditions	Result
Low Temperature Start-up test	13.4.4	EN 60068-2-1	Class OT4 Temperature: -40℃ Duration: 2 hrs	Pass
Dry Heat Test	13.4.5	EN 60068-2-2	Class OT4 & Cycle B Temperature: 70℃ Duration: 6 hrs Extended temperature: 85℃ Extended Duration: 10min	Pass
Low Temperature Storage Test	13.4.6	EN 60068-2-1	Temperature: -40℃ Duration: 16 hrs	Pass
Cyclic Damp Heat Test	13.4.7	EN 60068-2-30	Temperature: 25℃ - 55℃ Humidity: 90% RH Duration: 48 hrs	Pass
Random Vibration Test	13.4.11	EN 61373	Temperature: 25℃ +/- 10℃ Humidity: 50% +/-25% RH Frequency range: 5 ~ 150 Hz Vertical: 1.01 m/s^2 Transverse: 0.450 m/s^2 Longitudinal: 0.700 m/s^2 Duration: 10 min / axis	Pass
Simulated Long Life Test at Increased Random Vibration Levels	13.4.11	EN 61373	Temperature: 25℃ +/-10℃ Humidity: 50% +/-25% RH Frequency range: 5 ~ 150 Hz Vertical: 5.72 m/s^2 Transverse: 2.55 m/s^2 Longitudinal: 3.96 m/s^2 Duration: 5 hrs / axis	Pass
Shock Test	13.4.11	EN 61373	Temperature: 25℃ +/-10℃ Humidity: 50% +/-25% RH Frequency range: 5 ~ 150 Hz +/-Vertical: 30 m/s^2 +/-Transverse: 30 m/s^2 +/-Longitudinal: 50 m/s^2 Duration: 30ms x18 (Each axis 3 shocks)	Pass

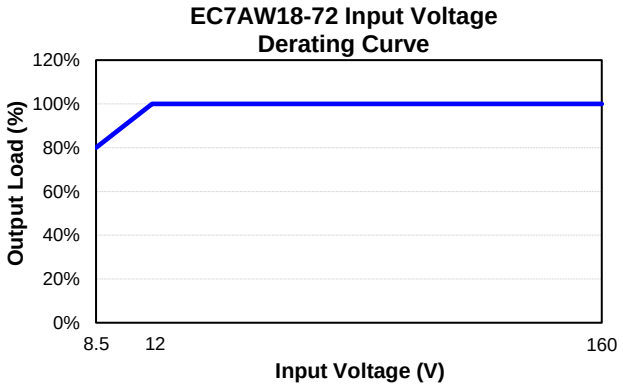
EN45545-2 Fire & Smoke Test Conditions

Item		Standard	Hazard Level
R22	Oxygen Index Test	EN 45545-2: 2013 EN ISO 4589-2: 2006	HL1, HL2, HL3
	Smoke Density Test	EN 45545-2: 2013 EN ISO 5659-2: 2013	HL1, HL2, HL3
	Smoke Toxicity Test	EN 45545-2: 2013 NF X70-100: 2006	HL1, HL2, HL3
R23	Oxygen Index Test	EN 45545-2: 2013 EN ISO 4589-2: 2006	HL1, HL2, HL3
	Smoke Density Test	EN 45545-2: 2013 EN ISO 5659-2: 2013	HL1, HL2, HL3
	Smoke Toxicity Test	EN 45545-2: 2013 NF X70-100: 2006	HL1, HL2, HL3
R24	Oxygen Index Test	EN45545-2: 2013 EN ISO 4589-2	HL1, HL2, HL3
R25	Glow - Wire Test	EN 45545-2:2013 EN 60695-2-11:2001	HL1, HL2, HL3
R26	Vertical Flame Test	EN 45545-2: 2013 EN 60695-11-10: 2013	HL1, HL2, HL3

CHARACTERISTIC CURVE

Power Derating Curve





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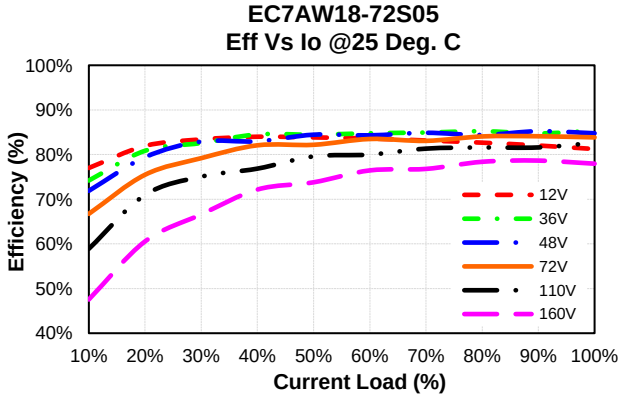
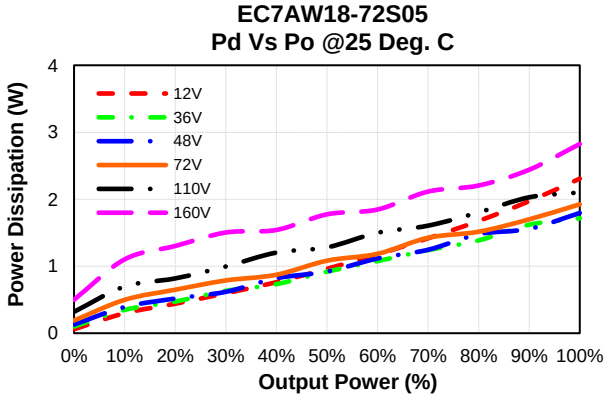
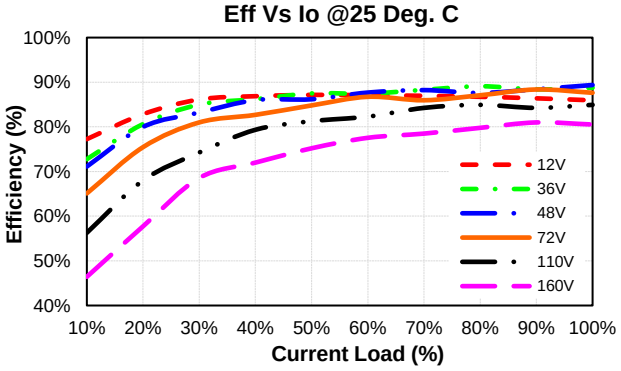




EC7AW18 Series

EC7AW18-72S12
Eff Vs Io @25 Deg. C



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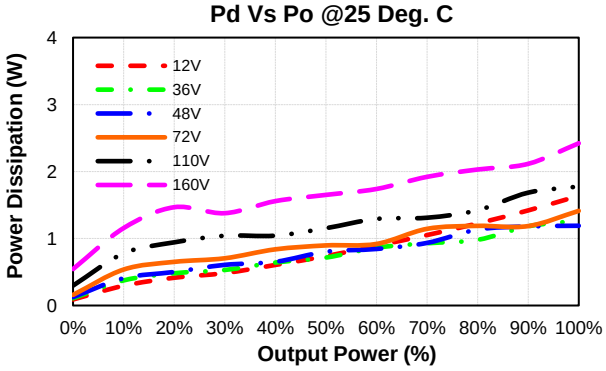

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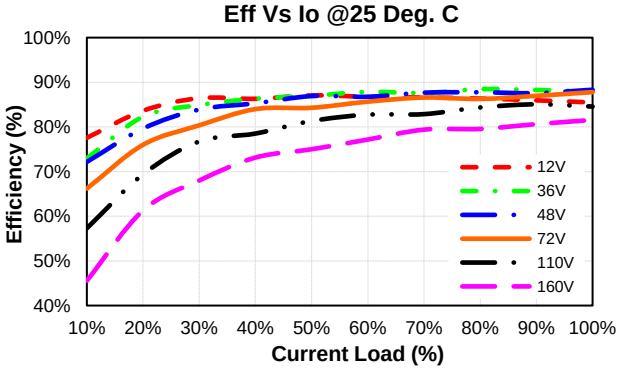

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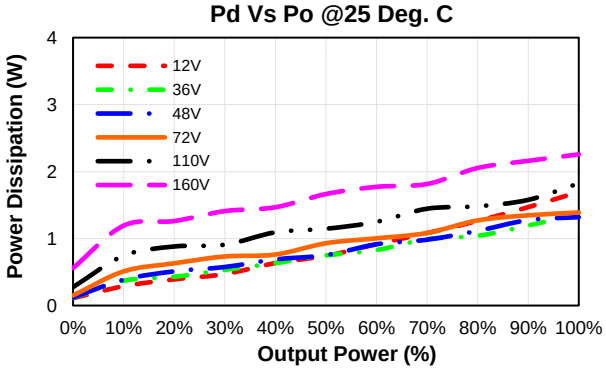

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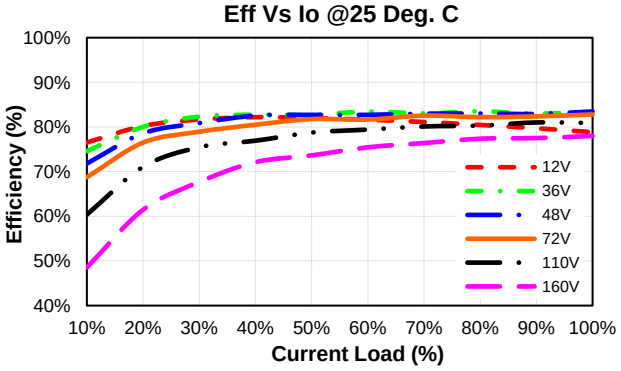

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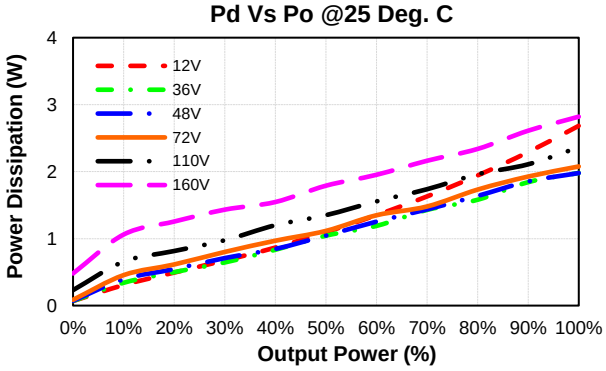

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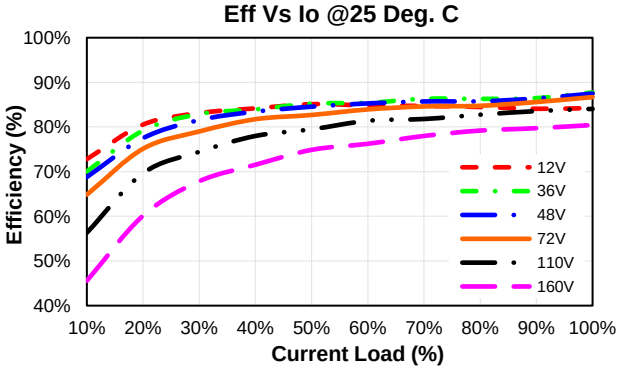

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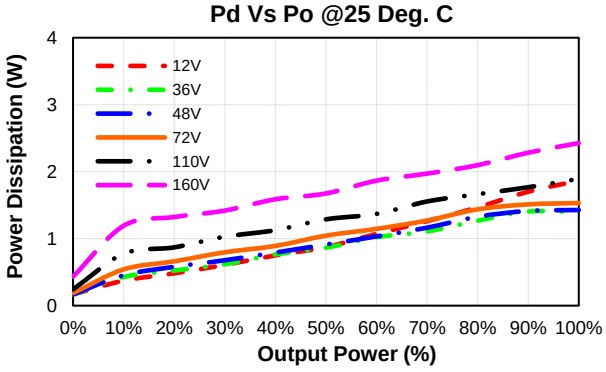

EC7AW18 Series

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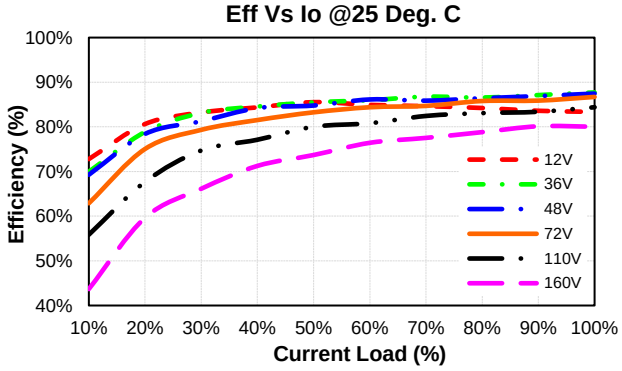

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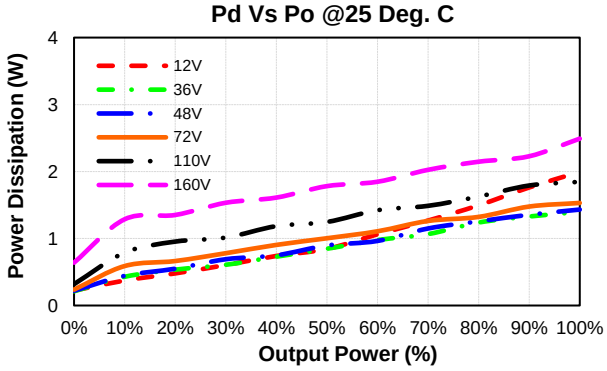

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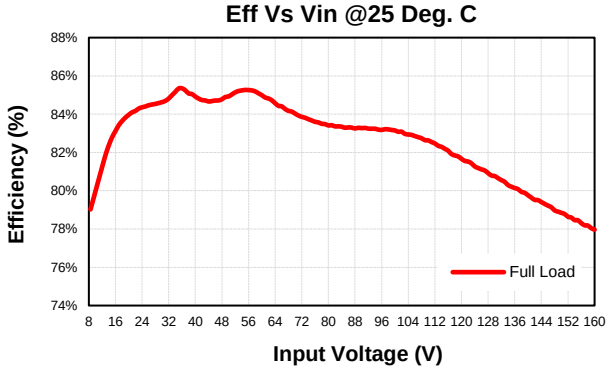

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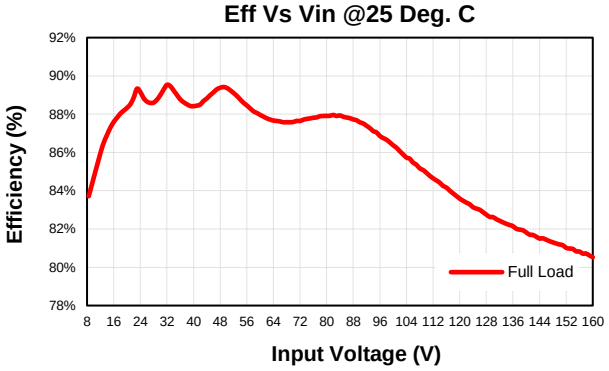

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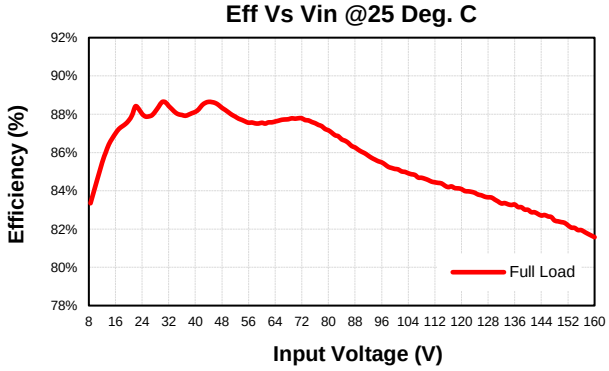

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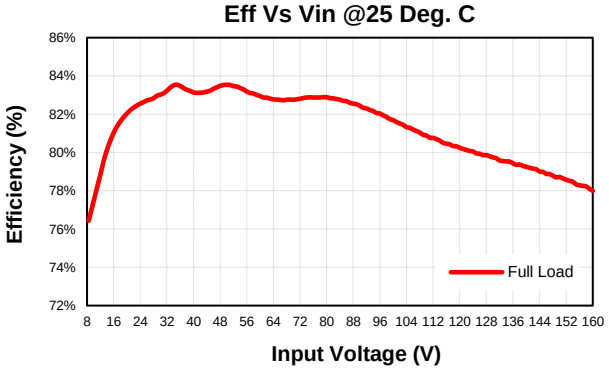

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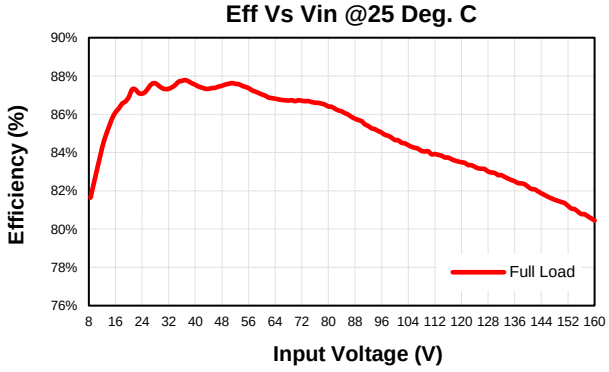

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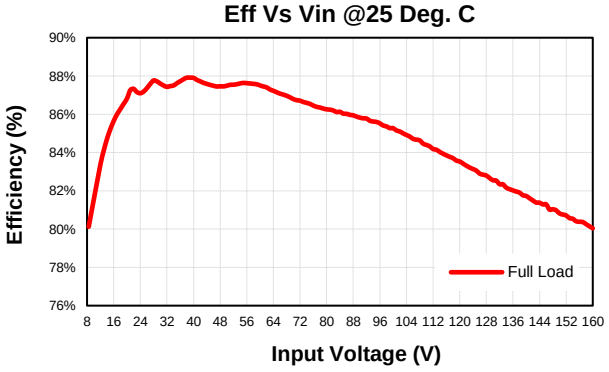
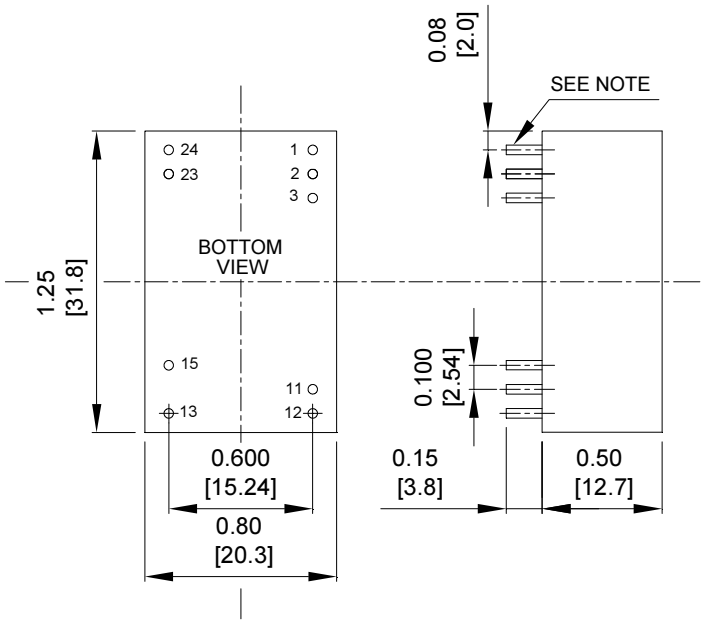


Note: 8.5Vin Efficiency at 80% Full Load

MECHANICAL SPECIFICATION



CASE A
NOTE:Pin Size is 0.02±0.002 Inch (0.5±0.05mm)DIA
All Dimensions In Inches (mm)
Tolerances 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	+V Input	+V Input
3	Remote On/Off	Remote On/Off
11	NP	Common
12	-V Output	NP
13	+V Output	-V Output
15	NP	+V Output
23	-V Input	-V Input
24	-V Input	-V Input

* NC-NO CONNECTION WITH PIN
* NP-NO PIN