

60DAW4_1.6 series

60W - Single/Dual Output - Ultra Wide Input - Isolated & Regulated
DIP DC-DC Converter



- ⊕ 60W DIL Package
- ⊕ 4:1 Wide Input Voltage Range
- ⊕ High Efficiency Up To 92%
- ⊕ Regulated Output Types
- ⊕ No Minimum Load Required
- ⊕ Over Power and Short Circuit Protection
- ⊕ Over Temperature Protection
- ⊕ Operating Temperature: -40°C to +76°C
- ⊕ UL94V-0 Package Material
- ⊕ 100% Burned In
- ⊕ 3 Years Warranty



Common specifications

Short circuit protection:	Continuous (hiccup mode) , auto-recovery		
Operation temperature range:	-Nominal Vin, 100% Load • -40°C ~ 39.7°C; (5Vout, 24Vout) • -40°C ~ 47.6°C; (12Vout, 15Vout, 24Vout)		
Thermal Impedance:	20LFM	11.0 °C/W	TYP
	100LFM	9.4 °C/W	TYP
	200LFM	6.6 °C/W	TYP
	400LFM	4.2 °C/W	TYP
Storage temperature range:	-55°C~+125°C		
Max. Case temperature:	105°C		
Over Temperature Protection	Case temperature 115°C MIN		
Humidity:	non-condensing, 5~95% MAX		
Thermal Shock:	MIL-STD-810F		
Shock &Vibration Test:	MIL-STD-810F		
Cooling:	Free air convection		
Case material:	Copper		
Potting material:	Silicone (UL94-V0)		
MTBF (MIL-HDBK-217F @25°C)*:	TBD hours		
Weight:	42g Typ.		

Input specifications

Item	Test condition	Min	Typ	Max	Units
Input Voltage	• 24Vin • 48Vin	9 18		36 75	VDC VDC
Surge voltage	100ms max. • 24Vin • 48Vin	-0.7 -0.7		50 100	VDC VDC
Start-up voltage	• 24Vin • 48Vin			9 18	VDC VDC
Under Voltage Shutdown	• 24Vin • 48Vin		7.5 16		VDC VDC
Start up Time	Constant Resistive Load, Nominal Vin • Power up • Remote ON/OFF		30 30		ms ms
Filter	Internal Pi type				
Remote ON/OFF (Ctrl PIN Refer To Vin PIN)	Positive Logic • DC/DC ON • DC/DC OFF Negative Logic • DC/DC ON • DC/DC OFF	Open or 3.5VDC Short or 0 VDC	12VDC 1.2VDC		
	Input Current O f Ctrl PIN Remote Off Input C urrent	- 0.5 3	0.5		mA mA

DC-DC Converter

60 Watt

The 60DAW4_1.6 series offers 60W of output, wide input voltage of 9-36VDC and 18-75VDC and features 1600VDC isolation, six-sided metal shield over current and short circuit protection.

All models are particularly suited to tele-communications, industrial, test equipments power etc.

Output specifications

Item	Test condition	Min	Typ	Max	Units
Voltage tolerance	100% Load	-2		+2	%
Voltage Adjustability		-10		+10	%
Line regulation	Vin (min) to Vin (max) @100% Load	-0.2		+0.2	%
Load regulation	0% to 100% Load	-0.5		+0.5	%
Ripple and noise*	• 5Vout (With an 1uF MLCC and a 10uF tantalum Capacitor) • 12Vout • 15Vout • 24Vout			100 150 150 150	mVp-p mVp-p mVp-p mVp-p
Transient Response Setting Time	25% load step change		350	500	µs
Transient Response Deviation	25% load step change	-5	±3	+5	%
Temperature Coefficient		-0.02	±3	+0.02	%
Output power protection	% of Io, Hiccup mode, Auto recovery	120	150	180	%
Over voltage protection	• 5VDC • 12VDC • 15VDC • 24VDC		6.2 15 18 30		VDC VDC VDC VDC
Switching frequency (PWM mode):	Full Load, Nominal Input		280		kHz

*Test ripple and noise by "parallel cable" method. Typical value at nominal input voltage and no load.

Isolation specifications

Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Input To Output (60s) Input (Output) To Case (60s)	1600 1000			VDC VDC
Isolation resistance	500Vdc	1000			MΩ

Example:

60DAW4_2415S1.5

60 = 60Watt; D = DIP; A = series; W4 = wide input (4:1);

24 = 24Vin; 15 = 15Vout; S = single output; 1.6 = 1600VDC isolation

Note:

- Input voltage can't exceed this value, or will cause the permanent damage.
- The load shouldn't be less than 5%, otherwise ripple will increase dramatically.
- Max. Capacitive Load is tested on Vin-nominal and full load.
- All specifications measured at Ta = 25°C, humidity <75%, nominal input voltage and rated output load unless otherwise specified.
- In this datasheet, all the test methods of indications are based on corporate standards.
- Only typical models listed, other models may be different, please contact our technical person for more details.
- Specifications subject to change without notice.

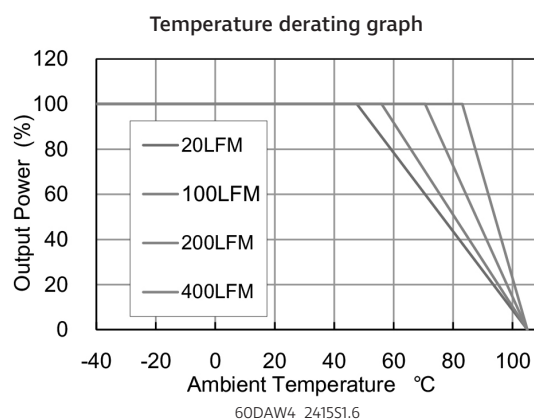
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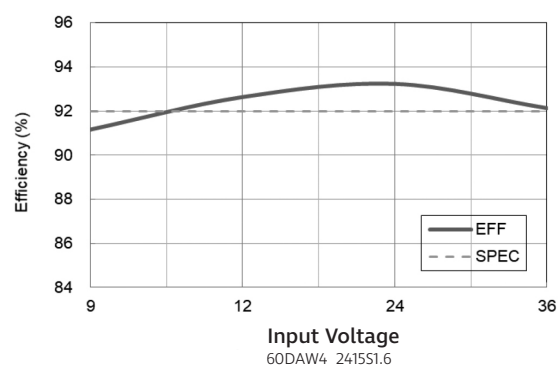
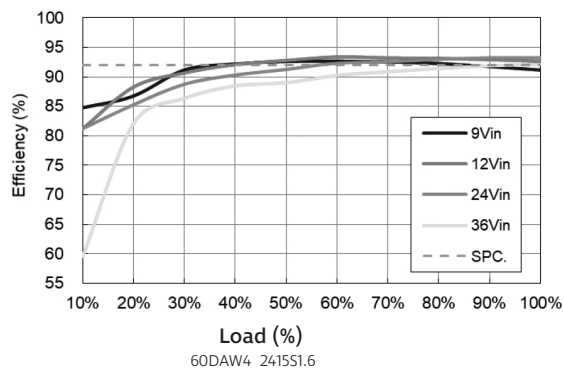
Product Selection Guide

Part Number	Input Voltage Range [VDC]	Input current [mA, typ] no load	Input current [mA, typ] full load	Output Voltage [VDC]	Output Current [mA]	Efficiency [% , Typ.]	Capacitive load [μF, max.]
60DAW4_2405S1.6	9-36	15	2717	5	12000	91	10000
60DAW4_2412S1.6	9-36	15	2717	12	5000	92	1800
60DAW4_2415S1.6	9-36	15	2717	15	4000	92	1200
60DAW4_2424S1.6	9-36	15	2747	24	2500	91	1000
60DAW4_4805S1.6	18-75	10	1374	5	12000	92	10000
60DAW4_4812S1.6	18-75	10	1359	12	5000	92	1800
60DAW4_4815S1.6	18-75	10	1359	15	4000	92	1200
60DAW4_4824S1.6	18-75	10	1374	24	2500	92	1000

Typical characteristics

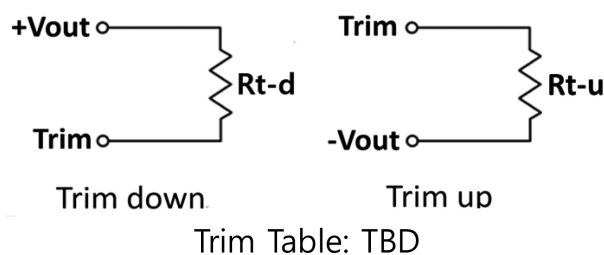


Efficiency



External Output Trimming

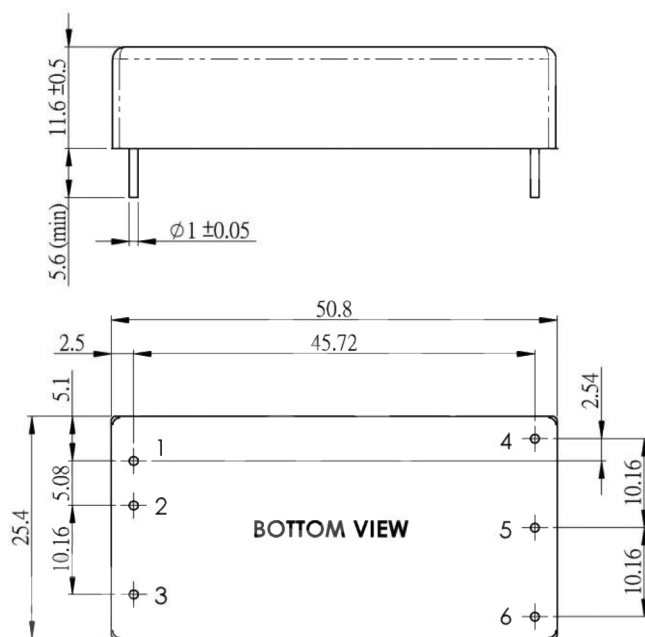
Output can be externally trimmed by using the method, shown as below: shown as below.



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Mechanical dimensions



Unit: mm

Tolerance: XX.X ± 0.5; XX.XX ± 0.25

PIN Assignment		
PIN	Define	Diameter
1	+Vin	1.0mm [0.04"]
2	-Vin	1.0mm [0.04"]
3	Ctrl	1.0mm [0.04"]
4	+Vout	1.0mm [0.04"]
5	-Vout	1.0mm [0.04"]
6	Trim	1.0mm [0.04"]