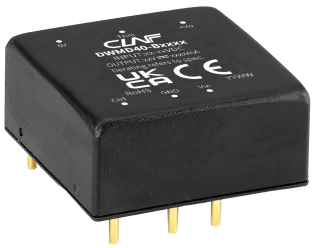
Descriptions

40W isolated, DC/DC Converter



RoHS

CE Report EN62368-1

UKCA Report BS EN62368-1

Features

- Ultra-Wide 4:1 input voltage range
- High efficiency up to 91.5%
- No-load power consumption as low as 0.096W
- I/O isolation test voltage 1.5k VDC
- Input under-voltage protection, output short-circuit, over-current, over-voltage, over-temperature protection
- Operating ambient temperature range: -40℃ to +105℃
- Industry standard pin-out
- Meets EN62368 standards

Applications

- Industrial Control
- Electric Power
- Instrumentation
- Communication

Selection Guide

Certification	Part No.	Input Voltage (VDC)		Output		Full Load Efficiency② (%) Min./Typ.	Capacitive Load (μF)Max.
		Nominal (Range)	Max.①	Voltage (VDC)	Current(mA) Max./Min.		
EN/BS EN	DWMD40-B2403	24 (9-36)	40	3.3	10000/0	87/89.5	7200
	DWMD40-B2405			5	8000/0	88/90	7200
	DWMD40-B2412			12	3333/0	89/91.2	2000
	DWMD40-B2415			15	2667/0	89/91.5	1500
	DWMD40-B2424			24	1667/0	88/90.1	1000
	DWMD40-B2428			28	1429/0	88/90.1	1000
	DWMD40-B4803	48 (18-75)	75	3.3	10000/0	87/89	7200
	DWMD40-B4805			5	8000/0	88/90	7200
	DWMD40-B4812			12	3333/0	89/91	2000
	DWMD40-B4815			15	2667/0	89/91	1500

Note:
①Exceeding the maximum input voltage may cause permanent damage;
②Efficiency is measured in nominal input voltage and rated output load;
③Rated output load is derated to 75% at minimun input voltage;
④Product images are for reference only; the actual product shall prevail.

Specifications

Product Specifications	Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Specifications	Input Current (full load / no-load)	24VDC nominal input series, nominal input voltage	3.3V output	--	1545/4	1580/12	mA
			Others	--	1852/4	1894/12	
		48VDC nominal input series, nominal input voltage	3.3V output	--	772/7	790/15	
			Others	--	926/7	947/15	
	Reflected Ripple Current	nominal input series		--	100	--	
	Surge Voltage (1sec. max.)	24VDC nominal input series		-0.7	--	50	VDC
		48VDC nominal input series		-0.7	--	100	
	Start-up Voltage	24VDC nominal input series		--	--	9	
		48VDC nominal input series		--	--	18	
	Input under-voltage protection	24VDC nominal input series		5.5	7.5	--	
		48VDC nominal input series		12	15	--	
	Start-up Time	Nominal input voltage & constant resistance load		--	30	100	ms
	Input Filter			Capacitance filter			
	Hot Plug			Unavailable			
	Ctrl①	Module on		Ctrl pin open or pulled high (TTL 3.5-12VDC)			
		Module off		Ctrl pin pulled low to GND (0-1.2VDC)			
		Input current when off		--	6	12	mA
Output Specifications	Voltage Accuracy②	5%-100% load		--	±1	±3	%
	Linear Regulation	Input voltage variation from low to high at full load		--	±0.2	±0.5	
	Load Regulation③	5%-100% load		--	±0.5	±1	
	Transient Recovery Time	25% load step change, nominal input voltage		--	250	500	μs
	Transient Response Deviation	25% load step change, input voltage range		--	±5	±8	%
	Temperature Coefficient	Full load		--	--	±0.03	%/℃
	Ripple & Noise④	20MHz bandwidth, nominal input voltage, 5%-100% load		--	100	150	mV p-p
	Trim	Input voltage range		90	--	110	%Vo
	Over-temperature Protection	Max. Case Temperature		--	125	--	℃
	Over-voltage Protection	Input voltage range		110	140	160	%Vo
	Over-current Protection			110	140	200	%Io
	Short circuit Protection			Hiccup, continuous, self-recovery			
General Specifications	Isolation	Input-output Electric Strength Test for 1 minute with a leakage current of 1mA max.		1500	--	--	VDC
	Insulation Resistance	Input-output resistance at 500VDC		1000	--	--	MΩ
	Isolation Capacitance	Input-output capacitance at 100kHz/0.1V	24VDC input series	--	10	--	nF
			48VDC input series	--	2.2	--	
	Operating Temperature	See Fig. 1		-40	--	+105	℃
	Max. Case Temperature	Rated output load		--	110	--	
	Storage Temperature			-55	--	+125	

	Storage Humidity	Non-condensing	5	--	95	%RH
	Pin Soldering Resistance Temperature⑤	Soldering spot is 1.5mm away from the case, 10 seconds max.	--	--	+300	℃
		Wave soldering, maximum 10 seconds	255	260	265	
	Vibration		10-150Hz, 5G, 0.75mm. along X, Y and Z			
	Switching Frequency⑥	PWM mode	--	400	--	kHz
	MTBF	MIL-HDBK-217F@25℃	1000	--	--	k hours
Mechanical Specifications	Case Material	Aluminum alloy				
	Dimensions	25.40 × 25.40 × 11.70 mm				
	Weight	20.0g (Typ.)				
	Cooling method	Free air convection				

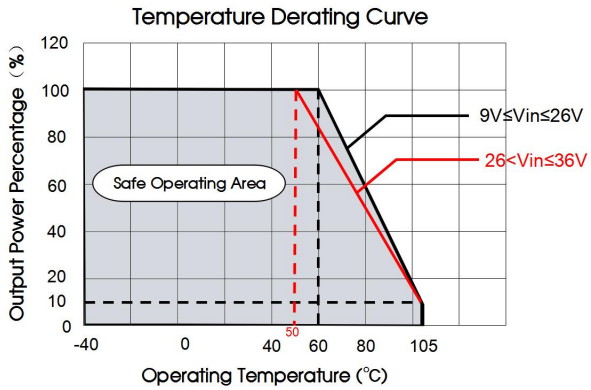
Note:
①The Ctrl pin voltage is referenced to input GND;
②Output voltage accuracy for 0%-5% load is ±5% max;
③Load regulation for 0% -100% load increases to ±3%;
④Under 0% -5% load conditions, ripple & noise does not exceed 5%Vo. By measuring method is used for Ripple and Noise test, please refer to Fig. 2. for recommended circuit;
⑤The pin soldering temperature tolerance is not the actual temperature set by the soldering iron but the temperature required for proper solder joints. The actual temperature set by the customer should be determined comprehensively based on factors such as PCB thickness, copper coverage, soldering iron power, and soldering iron tip selection;
⑥Switching frequency is measured at full load. The module reduces the switching frequency for light load (below 50%) efficiency improvement.

Electromagnetic Compatibility (EMC)

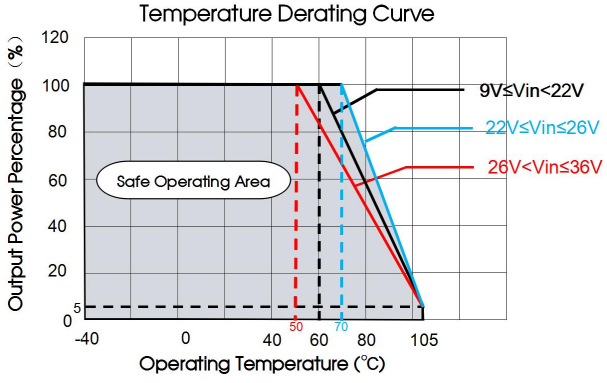
Emissions	CE	CISPR32/EN55032	CLASS B (see Fig.3-② for recommended circuit)	
	RE	CISPR32/EN55032	CLASS B (see Fig.3-② for recommended circuit)	
Immunity	ESD	IEC/EN61000-4-2	Contact ±6kV	perf. Criteria B
	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4	±2kV (see Fig.3-① for recommended circuit)	perf. Criteria A
	Surge	IEC/EN61000-4-5	line to line ±2kV (see Fig.3-①for recommended circuit)	perf. Criteria A
	CS	IEC/EN61000-4-6	3 Vr.m.s	perf. Criteria A

Characteristic Curve

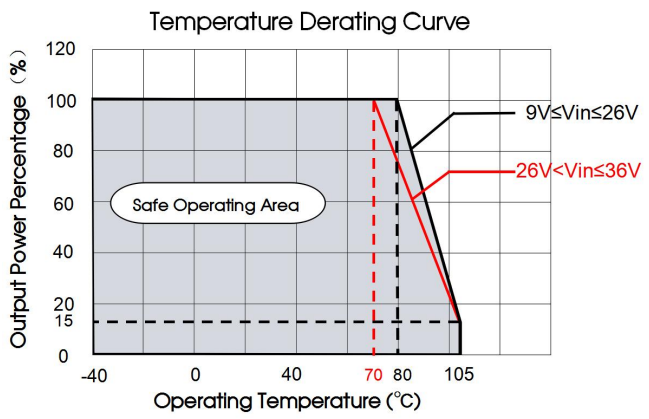
DWMD40-B2403



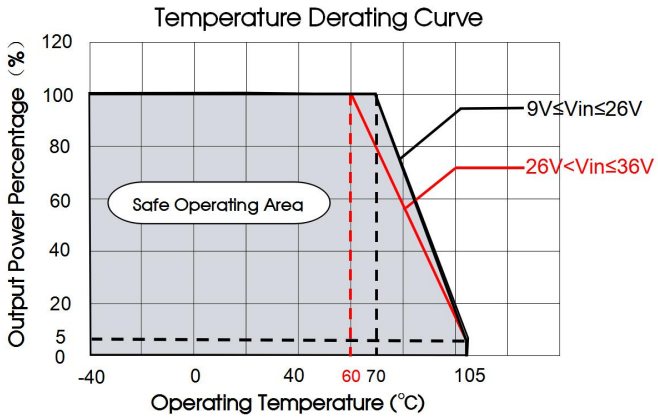
DWMD40-B2405



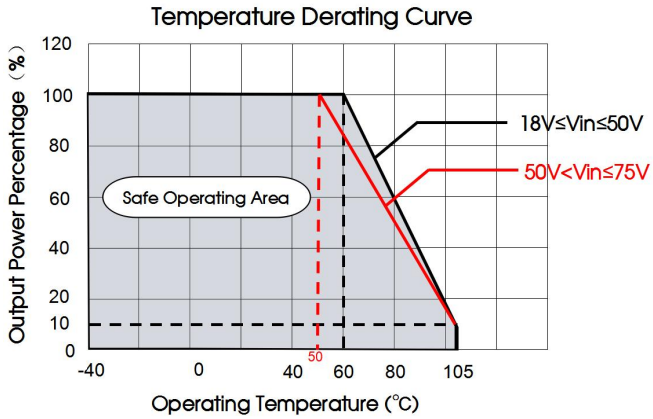
DWMD40-B2412/15



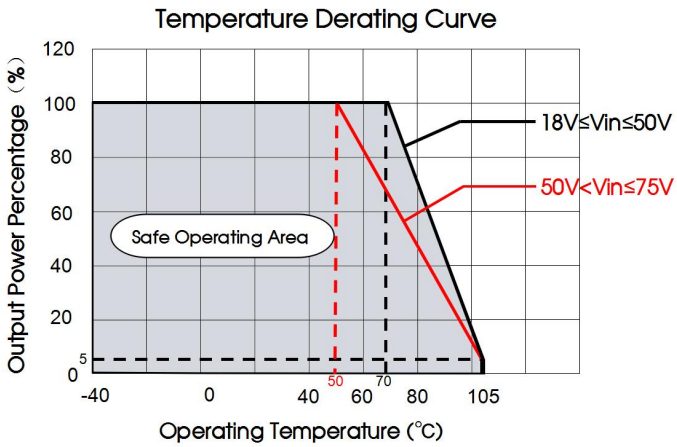
DWMD40-B2424/28



DWMD40-B4803



DWMD40-B4805



DWMD40-B4812/15

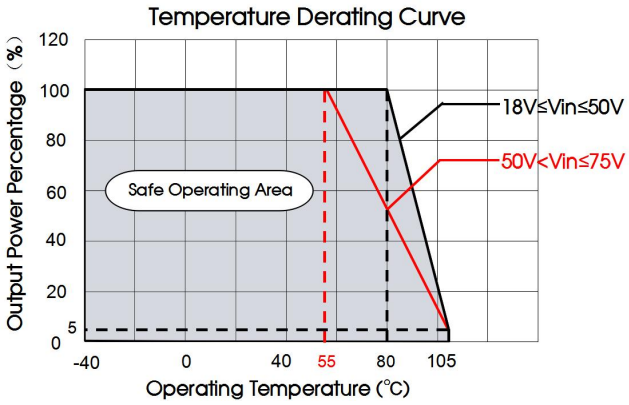
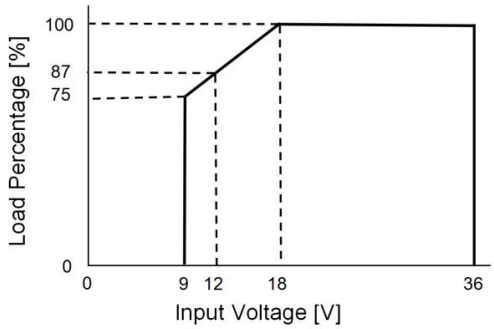
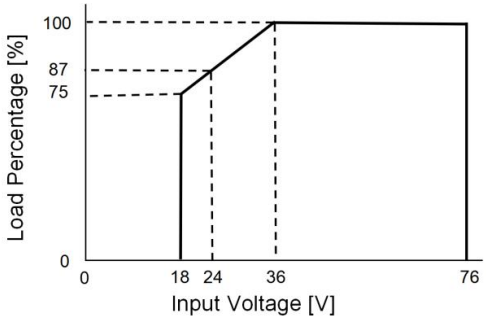


Fig. 1

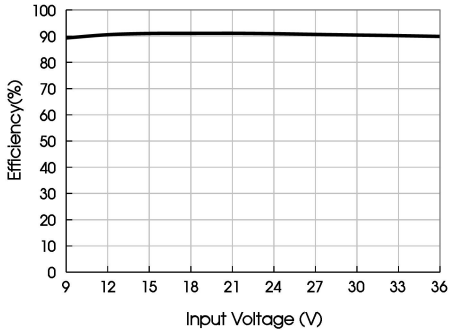
24VDC nominal input series



48VDC nominal input series

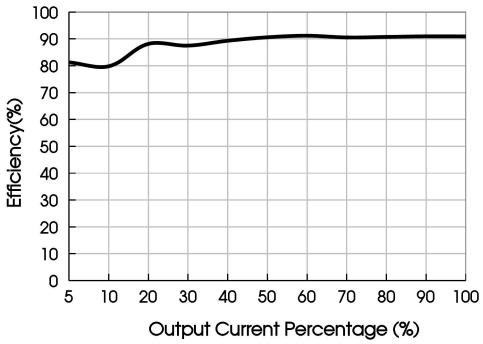


Efficiency Vs Input Voltage (Full Load)



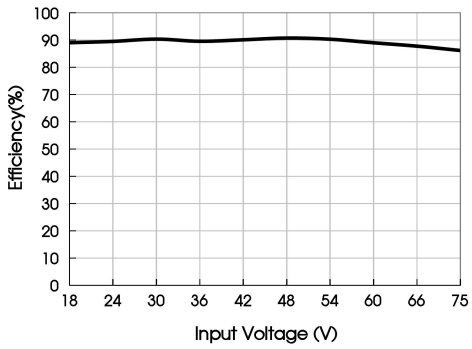
DWMD40-B2415

Efficiency Vs Output Load(Vin=24V)



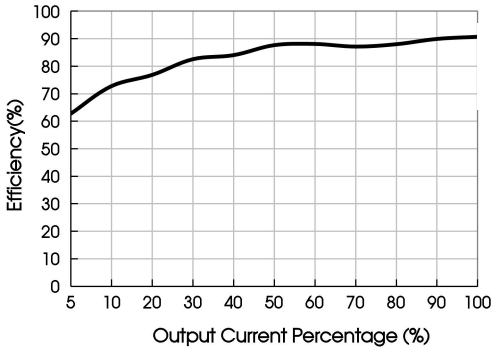
DWMD40-B2415

Efficiency Vs Input Voltage (Full Load)



DWMD40-B4815

Efficiency Vs Output Load(Vin=48V)



DWMD40-B4815

Design Reference

1. Typical application

①All DC-DC converters of this series are tested before delivery using the recommended circuit shown in Fig. 2.

②Input and/or output ripple can be further reduced by appropriately increasing the input & output capacitor values Cin and Cout and/or by selecting capacitors with a low ESR (equivalent series resistance). Also make sure that the capacitance is not exceeding the specified max. capacitive load value of the product.

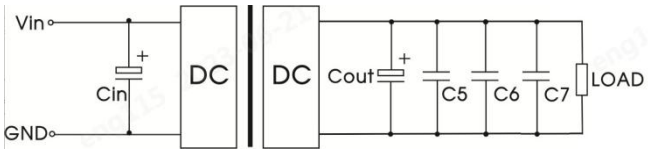


Fig. 2

Vin (VDC)	Vout (VDC)	Cin	Cout	C5	C6	C7
24	3.3-5	100uF /50V	470u F/50V	22uF/ 16V	1uF/ 16V	10uF/ 16V
	12/15			22uF/ 25V	1uF/ 25V	10uF/ 25V
	24/28			22uF/ 50V	1uF/ 50V	10uF/ 50V
48	3.3/5	100uF /100V		22uF/ 16V	1uF/ 16V	10uF/ 16V
	12/15			22uF/ 25V	1uF/ 25V	10uF/ 25V

2. EMC compliance circuit

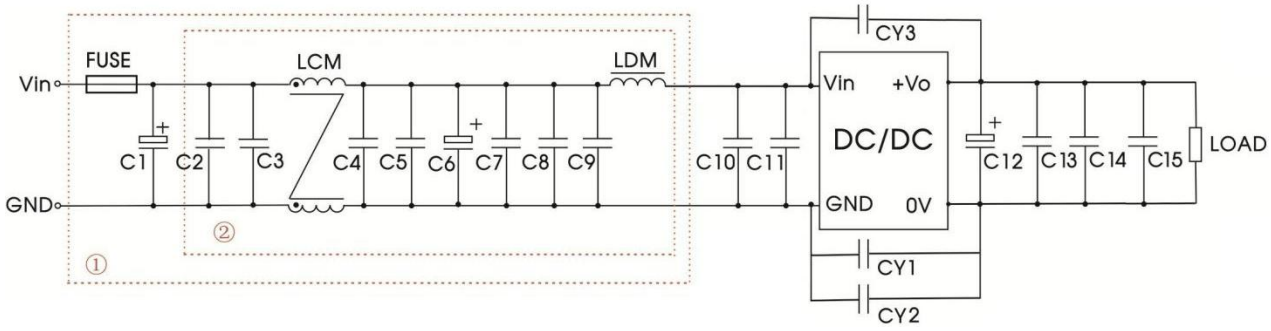


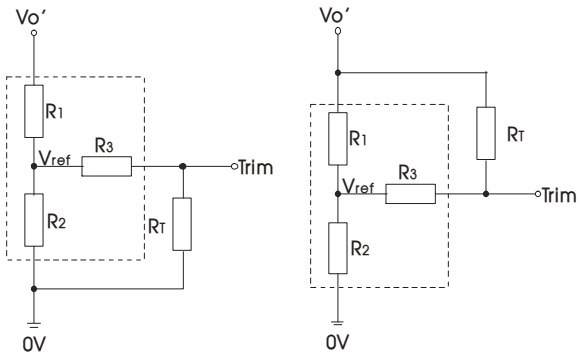
Fig. 3

Note: We use Part ① in Fig. 3 for Immunity tests and Part ② for Emissions test. Selecting based on needs.

Parameter description:

Components	Vin: 24VDC	Vin: 48VDC
FUSE	Choose according to actual input current	
C1	1000uF/50V	680uF/100V
C2/C3/C4/C5/ C7/C8/C9	4.7uF/50V	4.7uF/100V
LCM	350uH*2	10mH*2
C6	220uF/50V	100uF/100V
LDM	2.2uH	6.8uH
C12	Refer to the Cout in Fig.2	
C13/C14	Refer to the C5, C6 in Fig.2	
C15	/	Refer to the C7 in Fig.2
C10/C11	/	4.7uF/100V
CY1	Y2/222K/250VAC	2200PF/3000VDC
CY2/CY3	/	2200PF/3000VDC
Note: The Part ② of the circuit can be simplified, and ClassA can be satisfied by removing the LCM.		

3. Trim Function for Output Voltage Adjustment (open if unused)



TRIM resistor connection (dashed line shows internal resistor network)

Calculating Trim resistor values:

$$\text{up: } R_T = \frac{aR_2}{R_2 - a} - R_3 \qquad a = \frac{V_{ref}}{V_o' - V_{ref}} \cdot R_1$$

$$\text{down: } R_T = \frac{aR_1}{R_1 - a} - R_3 \qquad a = \frac{V_o' - V_{ref}}{V_{ref}} \cdot R_2$$

R_T is Trim resistance

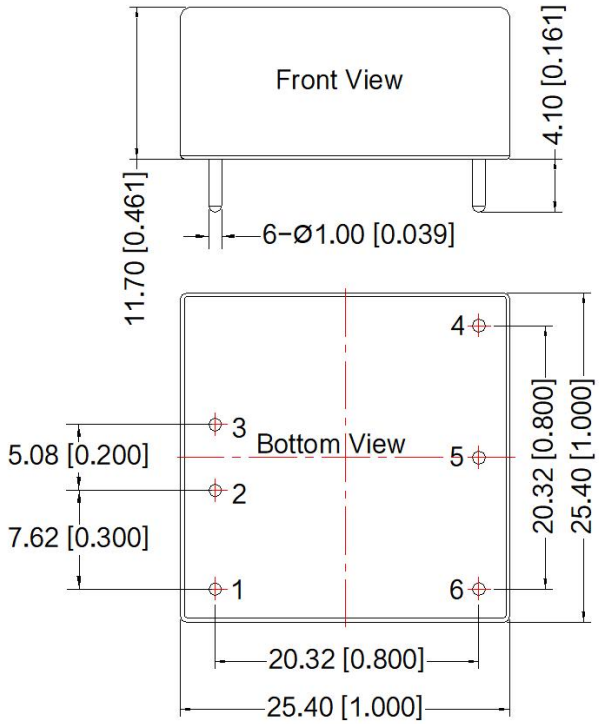
a is a self-defined parameter,

Vout(V)	R1(kΩ)	R2(kΩ)	R3(kΩ)	Vref(V)
3.3	4.83	2.87	4.7	1.25
5	2.87	2.87	5.6	2.5
12	10.91	2.87	15	2.5
15	14.35	2.87	15	2.5
24	24.77	2.87	17.4	2.5
28	29.41	2.87	17.4	2.5

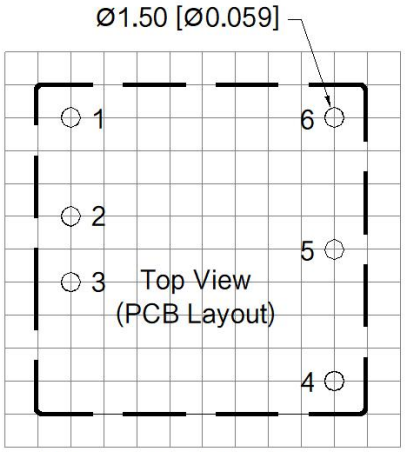
4. The products do not support parallel connection of their output

Dimensions and Recommended Layout

THIRD ANGLE PROJECTION



Note:
Unit: mm[inch]
Pin diameter tolerances: ± 0.10[± 0.004]
General tolerances: ± 0.50[± 0.020]



Note: Grid 2.54*2.54mm

Pin-Out	
Pin	Mark
1	Ctrl
2	GND
3	Vin
4	+Vo
5	Trim
6	0V

Note:

1. The maximum capacitive load offered were tested at input voltage range and full load;
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, humidity<75%RH with nominal input voltage and rated output load;
3. All index testing methods in this datasheet are based on company corporate standards;
4. We can provide product customization service, please contact our technicians directly for specific information;
5. Products are related to laws and regulations: see "Features" and "EMC";
6. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units;
7. The image certification marks are for reference only; please refer to the selection table for actual specifications. Certification is based on the physical mark or packaging label.