

DESCRIPTION

- The series of DC-DC switching power supplies in a package of 57.9x36.8x12.7 mm are capable of delivering 50 watts. They are designed for industrial control system, railway application, transportation system.

FEATURES

- 50 Watts output power in quarter brick
- Ultra wide 8:1 input voltage range from 16.8-137.5VDC
- Efficiency up to 89%
- 3KVDC / 1 minute isolation
- RoHS compliant

WATTAGE

Wattage: 50W

DIMENSION

Dimension: 57.9 (L) x 36.8 (W) x 12.7 (H)mm



SAFETY STANDARD APPROVAL

Meet EN50155

ENVIRONMENTAL SPECIFICATION

Operating temperature: -40°C to +110°C

SELECTION GUIDE

Part number	Input voltage	Output voltage	Output current @ full load	Ripple & Noise ⁽¹⁾ (max.)	Efficiency ⁽²⁾ (typ.)	Capacitive load ⁽³⁾ (max.)
D50-BQ8-AH	16.8-137.5	12 VDC	4167 mA	150mVp-p	88%	3000uF
D50-BQ8-AA	VDC	24 VDC	2083 mA	150mVp-p	87%	1200uF

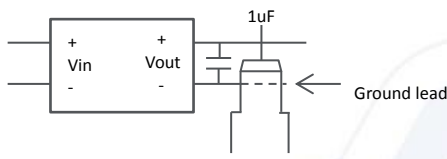
- The efficiency is test by nominal input and max. full load @25°C.
- The capacitive load is test by minimum input and constant resistive load.

SPECIFICATION

	Parameter	Conditions	Min.	Typ.	Max.	Unit
Input	Input filter		Pi type			
	Input voltage range		16.8	110	137.5	VDC
	No load input current				13	mA
	Under voltage lockout	0%~100% load	12			VDC
	Start-up voltage	0%~100% load			14	VDC
	Input surge voltage	1s max.			200	VDC
	Start-up time/max	100% Load at Nominal Vin		40		mS
	Remote on/off	DC-DC off DC-DC on		Open or 3V < Vr < 12V Short or 0V < Vr < 1.2V		
Output	Output voltage accuracy	100% Load & 110V input	-1		+1	%
	Voltage adjustability			±10		%
	Minimum load				0	%
	Line voltage regulation	LL to HL at 100% load	-0.2		+0.2	%
	Load voltage regulation	0%~100% load	-0.2		+0.2	%
	Ripple & noise	@20MHz BW (@110Vin)			150	mVp-p
	Temperature coefficient				+0.05	%/°C
	Transient response recovery time	25% load step change (75%-100% load)		500		µs
Environment	Short circuit protection		Continuous, automatic recovery			
	Operating case temperature	Baseplate temperature	-40		110	°C
	Over temperature protection			115		°C
	Relative humidity		5		95	%RH
	Operating altitude			4000m		
	Safety approval			Meet EN50155		
Function	Isolation voltage	1 minute, Input to Output	3			KVDC
	Isolation resistance		1000			MΩ
	Isolation capacitance			2200		pF
	Over load protection	% of load at 110 Vin		150		%
	Over voltage protection	0% ~ 100% load		150		%
	MTBF	25°C	820			KHrs
	Short circuit protection			Continuous automatic recovery		
	Vibration			EN61373		
EMI	EMI	EN55032/ 55011		Class A		
	ESD	EN61000-4-2 air±8kV, contact±6kV		Criteria A		
	Radiated immunity	EN61000-4-3 10V/m		Criteria A		
	Conducted immunity	EN61000-4-6 10Vrms		Criteria A		
	Fast transient	EN61000-4-4 ±2kV		Criteria A		
	Surge	EN61000-4-5 ±2kV		Criteria A		

- All specifications valid at nominal input voltage, full load and 25°C after warm-up time unless otherwise stated.
- The product information and specifications are subject to change without prior notice.

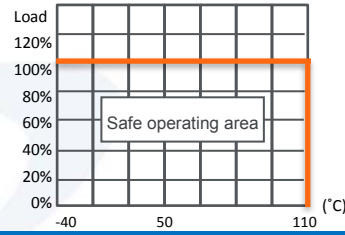
INPUT REFLECTED RIPPLE CURRENT TEST STEP



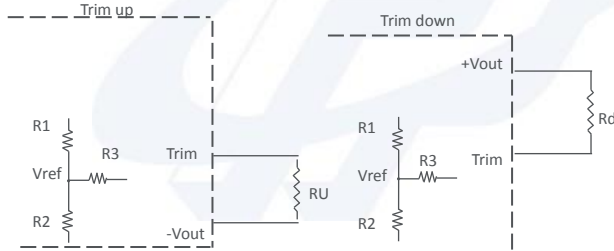
20MHz BW

DERATING CURVE

Baseplate temperature natural convection (Nominal Vin)



TRIM APPLICATION



Formula for trim resistor:

$$\text{UP: } R_u = \frac{aR_2}{R_2 - a} - R_3 \quad a = \frac{V_{ref}}{V'_0 - V_{ref}} \cdot R_1$$

$$\text{DOWN: } R_d = \frac{bR_1}{R_1 - b} - R_3 \quad b = \frac{V'_0 - V_{ref}}{V_{ref}} \cdot R_2$$

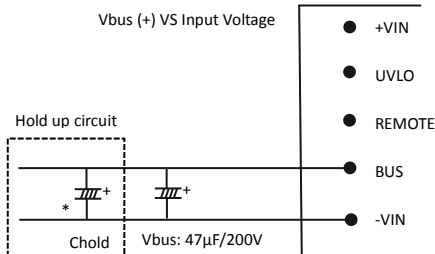
Note:

1. R_u, R_d is mean trim resistor, please check the formula.
2. a & b : user define parameter, no actual meanings.
3. V'_0 is mean trim up/down voltage.
4. Value for R_1, R_2, R_3 and V_{ref} refer to the table below.

Vout	12V	24V
R1	12.56KΩ	17.2KΩ
R2	3.3KΩ	2KΩ
R3	24.9KΩ	15KΩ
Vref	2.5V	2.5V

EXTERNAL CAPACITOR

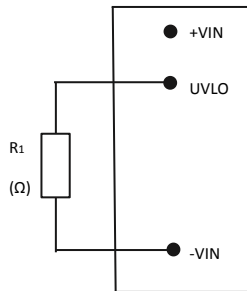
Vbus (+) VS Input Voltage



Chold table

Nominal Vin	24V	36V	48V	72V	96V	110V
10ms (S2)	800uF	800uF	800uF	440uF	180uF	120uF
30ms (C2)	2200uF	2200uF	2200uF	1200uF	540uF	400uF

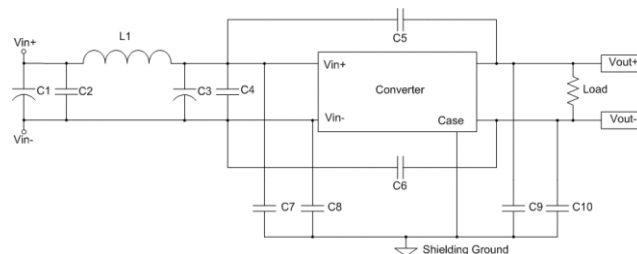
UNDER VOLTAGE LOCKOUT



The under voltage threshold can set by external resistor placed between the UVLO and -VIN UVLO table

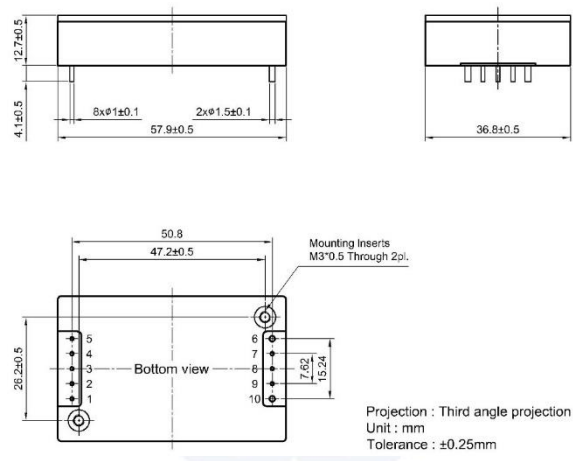
UVLO	External Resistor	OPEN	140K	62K	27K
Turn-off Threshold	$R_1(\Omega)$	12.7V	19.6V	26.3V	39.6V
Turn-on Threshold		13.6V	20.4V	27.3V	40.8V

EMI FILTERING SUGGESTION FOR EN50155 CLASS A

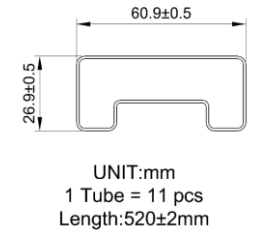


Vout	C1	C2,4	C3	C5	C6	C7,8,9,10	L1
12V	100uF 200V Aluminum Cap. KXJ Series	0.68uF 1210 250V Ceramic Cap.	47uF 200V Aluminum Cap. KXJ Series	1000pF 1808 3kV Ceramic Cap. 2200pF 1808 3kV Ceramic Cap.	1000pF 1808 3kV Ceramic Cap.	1000pF 1206 2kV Ceramic Cap.	10uF GSTD1265PE- 100M
24V							

MECHANICAL SPECIFICATION **PACKAGE**



Pin	Function
1	+Vin
2	UVLO
3	REMOTE
4	Bus Pin
5	-Vin
6	-Vout
7	-S
8	Trim
9	+S
10	+Vout



RECOMMENDED FOOTPRINT

