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1. INTRODUCTION

The *GB2R 60W DC/DC converter* is a highly integrated DC/DC converter designed for Railway application. The input stage of these converters are designed in accordance to EN50155, with wide input window, additional surge protection, as well as EMC harden. Different output voltages are available. The full encapsulation of these converters provide ultimate moisture and shock protection. The P2 series also use a patented startup circuitry to enhance startup of high surge load.

The unit is encapsulated into an aluminium U-channel as the heatsink surface for the converter. Utilising the latest planar magnetic and high integration ceramic technology, the unit footprint is measured only 65x110mm, with the total height of 17mm.

Input and Output to the unit are via 5mm pluggable screw-lock terminal blocks. A green LED indicates the present of output voltage. Output voltage is factory set to the initial accuracy of 0.5%.

Maximum operating ambient temperature of the unit is 60°C without derating (50°C for 5V model). The maximum surface temperature rise of the heatsink would be around 40°C (50°C for 5V model) above ambient. (Direct skin contact with the heatsink surface should be avoided.)

The module has an internal shunting device for input surge and reverse polarity protection. In order for these protections to function correctly and also to avoid fire risk, the unit must be connected with an external fuse. Recommended fuse rating for different models are in Sec. 2.1.

2. ELECTRICAL SPECIFICATION

2.1 Input

Parameter	min	typ	max	unit
Input				
Voltage range	77		138	V_{dc}
Abnormal input voltage (10s) <i>output regulation maintained</i>	65		154	V_{dc}
Input current (max @ 60Vdc)			1.5	A
External input fuse	2~2.5A F			
Reverse polarity protection	Blow input fuse. Internal clamp with no damage to unit.			
Input surge/transient protection (Design to meet)	EN50155 & ENV50121-3-2.			
Input startup voltage		62		V_{dc}
Input shutdown voltage		50		V_{dc}

2.2 Output

Parameter	min	typ	max	unit
OUTPUT				
Setup accuracy (V_{nom})	99.5		100.5	% V_{nominal}
Rated Current (I_{rated})	See table 2.6			
Load regulation (0A to I _{rated}) (5V model)		0.1	0.25 0.5)	±% V_{nominal}
Line regulation (full input range)		0.1	0.25	±% V_{nominal}
Output noise: switching frequency ripple high frequency spike (30MHz BW) Note: Measured at the output connector with 100n ceramic decoupling capacitor across output.			0.25 0.5	±% V_{nominal} ±% V_{nominal}
Current limit	105	115	135	±% I_{rated}
Overload protection	Trip and restart, approx. 0.3s on, 3s off.			
Efficiency at full load (model dependent)		88		%
Overvoltage protection (unit latchoff, reset by recycle input power)	120	125	130	±% V_{nominal}

2.3 Environmental factors

Parameter	min	typ	max	unit
Operating Ambient temperature (5V model)	-20		+60 +50)	°C
Cooling	Natural Convection cooling			
Thermal shutdown (Unit shutdown and automatic recover after overtemperature condition subside.)		105		°C _{chassis}
Operating Orientation	Stand-alone unit. No special orientation.			
Humidity			95	%
Altitude			7700	metres
Shock & vibration (Design to meet)	MIL-STD 810E & IEC61373			
Electrostatic Discharge immunity:	Design to meet IEC61000-4-2: 4KV			
MTBF (G_m, T_{amb}=25°C)	400Khours (estimated)			
INTERFACE				
Input	3 way pluggable screw-lock 5mm terminal block			
Output	4 way pluggable screw-lock 5mm terminal block			
Indication: DCOK (Output)	Green LED on chassis (output face)			

2.4 Isolation

ISOLATION				
Input to Output	1000	(2KV 1second)		Vdc
Input to chassis	1000	(2KV 1second)		Vdc
Output to Chassis	500			Vdc

2.5 Mechanical

MECHANICAL	
Outside dimension	65x110x17mm
Casing	Aluminium with Black anodisation.
Weight	0.5Kg max

2.6 GB2R Series 60W output options

OUTPUT V	5V	12V	13.7V (C12V)	24V	27.4V (C24V)
INPUT V					
110V , 72V	12A	5A	4.2A	2.5A	2.1A

Note: Both terminals on the output connector should be used for connection to reduce voltage drop associated with contact resistance, especially on high current model such as 5V 60W unit.

Order Number:

GB2R-60-xyyy

XX:input Voltage , yy:output voltage



3.1 Mechanical outline

