

# 95 Watt Military 7 Outputs Isolated DC-DC Converter

## Model: MVM-95-12-7K

### Main Features:

- Meets MIL-STD-1275D/ MIL-STD-810G/ MIL-STD-461G/ MIL-STD-704F
- High Efficiency – Typical 85%
- Fully protected for Over-Load/ Short/ Over-Voltage/ Over-Temperature
- 7 outputs
- Convection cooling
- No external EMI filter needed

### Typical Applications:

- EW Systems
- RWR Receivers
- Missile
- Navigation Systems
- Outdoors Telecom



### Product Specification:

#### **Input Voltage Characteristics:**

Input voltage range 18-33VDC

Reverse Polarity Protection

Protection from Transient at input voltage going down from 28VDC to 0VDC at duration of 500 uSec

Soft Start at input stage – the input voltage will ramp on input

Capacitance after 1sec to 28VDC

#### **Output Voltage Characteristics:**

#### **Output Voltage and Currents**

Outputs	Voltage	Current
12 V Out_ESS_A2D (Essential)	12V	5.0 A
3.3 V Out_ESS_TGS (Essential)	3.3V	0.260 A
12 V Out TGS	12V	0.05 A
5.5 V Out TGS	5.5V*	4.0 A
3.3 V Out TGS	3.3V*	3.0 A
-5 V Out TGS	-5.0V	0.05 A
3.3V_MB (Essential)	3.3V	0.200 A

Line/ Load & Temperature regulation < +/-2%

Max. ripple and noise over 20 Hz – 20 MHz 100 mV p-p

Current limit on each output – 125-150% of rated current – Hick-Up

Over-Voltage on each output – Non-latch type

All outputs will maintain regulation with no load applied.

Minimum Power Supply Efficiency 85% at Operating Temperature

\*Note: Design requires that outputs #4 and #5 will have the ability to be increase the voltage to 6.0 and 4.3 Volts respectively if needed at a later date if specified.

## **Digital Controls and Sense:**

### 1. Logic Signals Characteristics

All signals shall be referenced to the P.S. A2D\_RTN.

LVTTL level means – Low < 0.4V, High ( 3.6V > High > 2.4V)

### 2. All Digital outputs indication Signal (V\_ALL\_D\_GOOD) output

A LVTTL level, which monitors the voltage accuracy of all the regulated outputs.

V\_ALL\_D\_GOOD = HIGH, when the all regulated voltage outputs are > 95% of their Specified Nominal Voltage.

V\_ALL\_D\_GOOD = LOW, when at least one of the regulated voltage outputs is < 95% of its Specified Nominal Voltage.

### 3. All Analog outputs indication Signal (V\_ALL\_A\_GOOD) output

A LVTTL level, which monitors the voltage accuracy of all the regulated outputs.

V\_ALL\_A\_GOOD = HIGH, when the all regulated voltage outputs are > 95% of their Specified Nominal Voltage.

V\_ALL\_A\_GOOD = LOW, when at least one of the regulated voltage outputs is < 95% of its Specified Nominal Voltage.

### 4. Over Temperature Signal (PS\_OVER\_TEMP) output

A LVTTL signal, which indicates that the power supply reached to the maximum allowed temperature.

OVERTEMP = High. P.S. temperature is under 90°C

OVERTEMP = Low. P.S. temperature is above 90°C

### 5. Synchronize Lock (SYNC\_LOCK) output

The SYNC\_LOCK is a TTL logic signal indicates that the power supply is locked on the external synchronization signal. This signal is normally low and it driven high when the power supply is not locked on the external synchronization signal.

### 6. Sleep Indicator

Sleep Indicator is a LVTTL logic signal that will provide a high output as long as the input voltage is above 12V and will go low when the input level goes below 12V.

## 7. ON/OFF input

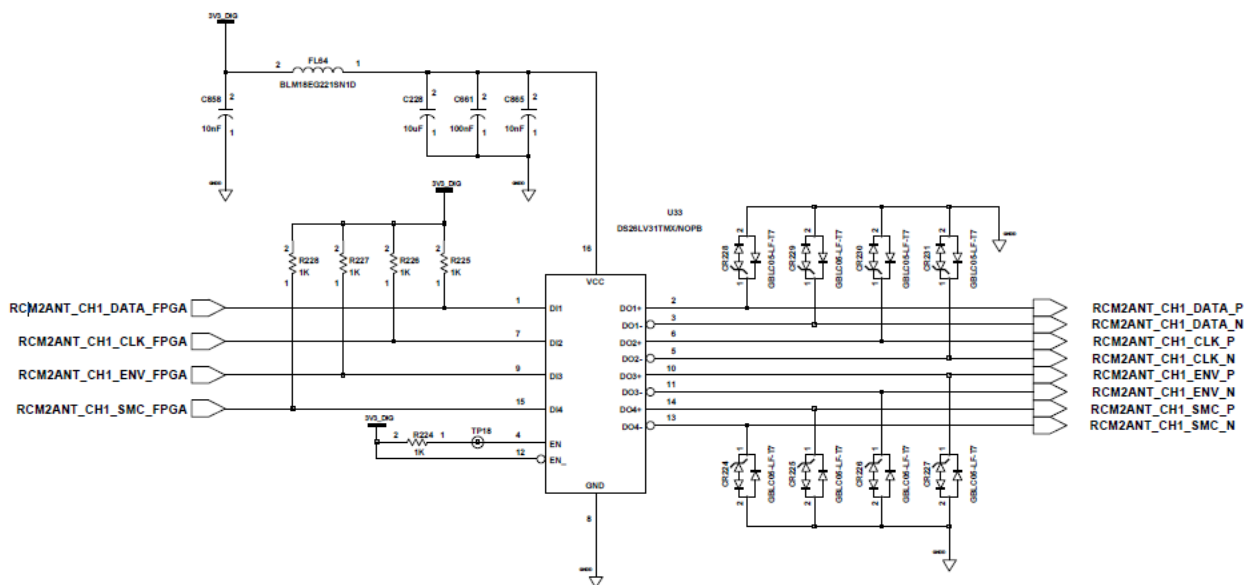
7.1 The power supply turn on shall be accomplished by activating “ON/OFF” line as described below. On/Off signal is RS422 differential

7.2 The ON/OFF control will only control the main power supplies TGS and A2D.

including the essential outputs, but the MB\_3.3V will remain on regardless of the state of the on/off line.

7.3 The ON/Off control shall be always fully functional including in the sleep mode.

7.4 The schematic below is the driver circuit for on/off and provided for reference.



**Figure 1: On/Off Control Interface**

### **Isolation Resistance:**

Input – output: 100Mohm (100 VDC)

Input – case: 100Mohm (100 VDC)

Output – case: 100Mohm (100 VDC)

Vin Return – all internal returns 100Mohm (100 VDC)

A2D\_RTN – MB\_RTN <1 ohm

All other RTN to each other and case 100Mohm

## Environmental:

Units shall exhibit in-spec electrical and mechanical performance under all combinations of environmental conditions. And environmental type.

No.	Environment	Non-Operating	Operating	Applicable Standard
[1]	High Temperature	+71°C (ambient)	+85°C -Central Unit (ambient and on mounting slots)	Mil-STD-810F Method 501.4 Procedures I & II
[2]	Low Temperature	-40°C (ambient)	-40°C (ambient)	Mil-STD-810F Method 502.4 Procedures I & II
[3]	Thermal Shock	-30°C ÷ +71°C A rate of at least 20°C/min	MIL-STD-810C Method 503.1 Procedure I	
[4]	Fungus	Fungi-inert materials only shall be used		MIL-STD-810C Method 508.1, Procedure I
[5]	Functional and Endurance Vibration(*)	<b>Random-on-Random;</b> Sweep cycles at 0.5 Grms between 5 Hz-2,000 Hz before and after endurance test; 180 min per axis	<b>Random-on-Random;</b> 15 min per axis before and after Endurance test	MIL-STD-810G; Procedure per Ref. Doc. 2.1.1
[6]	Secured Cargo Random Vibration (**)	See Figure 7 below	---	MIL-STD-810F Method 514.5 Procedure I & II
[7]	Functional Mechanical Shock (*)	---	Half sine, 40g / 11 msec, 18 shocks	MIL-STD-810C Method 516.2 Procedure I
[8]	Gun Fire Mechanical Shock	Terminal-peak Sawtooth Shock Pulse 2 shocks per axis, two directions 75G/6ms, 12 shocks		MIL-STD-810C Method 516.2 Procedure III
[9]	Shock	Transit Drop(**) Height of 1.2m, 26 drops, Bench Handling for antenna	---	MIL-STD-810C Method 516.2 Procedure II@V

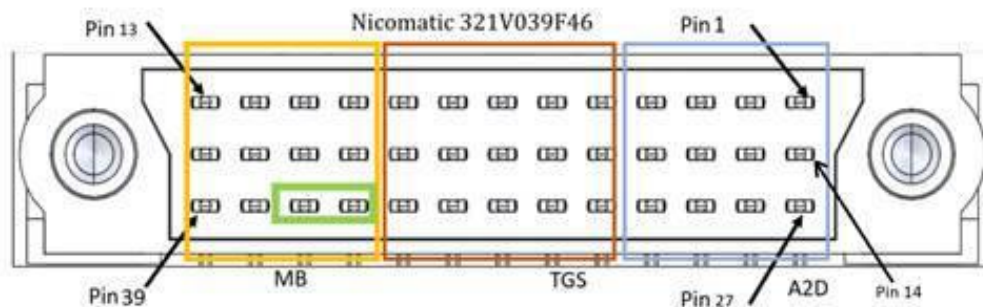
## Mechanical Outline Size:

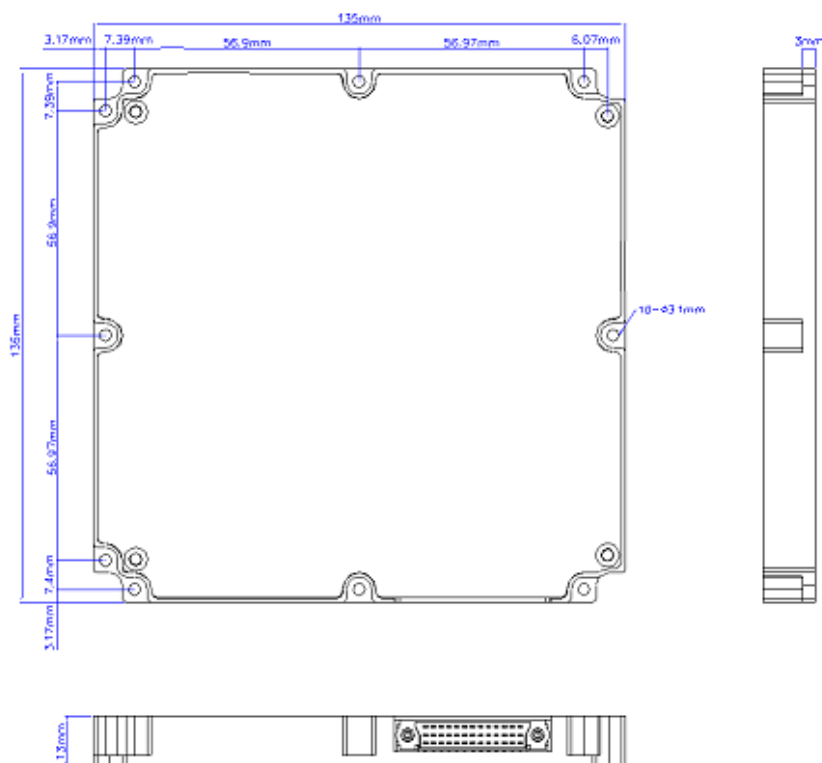
Weight – 600 gram

Size – 135.000mm x 135.000 mm x 13 mm

Cooling – Base plate

Input/ Output connector – Nicomatic 321V039F46 or Eq.





## Pinout Specification and Function:

Pin Number(s)	Name	Function
1,14,27	A2D_RTN	Return for A2D
2,15,28	12V_Out_ESS_A2D	12V supply for A2D (Essential)
3	Sync_Lock_A2D	Indicator for sync lock function
4	V_All_D_Good_A2D	Indicator for digital function
5,18	TGS_RTN	Return for all TGS supplies
6,19,32	3.3 V Out #5 TGS	3.3 V supply for TGS unit
7,20,33	5 V Out #4 TGS	5V supply for TGS unit
8	3.3V_Out_ESS_TGS	3.3V supply to TGS (Essential)
9,22	TGS_RTN	Return for all TGS supplies
10	Spare	
11	Sync IN	external synchronization signal for switchers
12,25,38	<b>Vin_Return</b>	Return for Input Power Source (case ground)
13,26,39	<b>Vin_28V</b>	Input Power Source
16	Sleep_Indicator_A2D	Indicator for low input voltage
17	V_ALL_A_Good_A2D	Indicator for all power supply function
21	12V_Out TGS	12 V supply to TGS
23	ON/OFF -	Differential -control signal to turn main supplies on and off
24	ON/OFF +	Differential +control signal to turn main supplies on and off
29	Spare	
30	Overtemp_A2D	Indicator for over temperature condition
31	Spare	
34	-5 V Out #6_TGS	Negative 5V supply for TGS unit
35	Spare	
36	MB Return	Return for 3.3V_MB Supply
37	3.3V_MB	3.3V Supply (Essential)