SUMRQ075EDP1201

75 Watt DC-DC Converters

- **12:1 Input Range**
- **75 W Isolated Output Power**
- **Enclosure type**
- **Standard "Quarter" Package**
- **3000VDC Input To Output Basic Insulation**
- **Meet Requirements of standard EN50155**
- **Safety Approvals Pending**
- **RoHS Compliant**

SPECIFICATIONS

All specifications are typical at nominal line, full load and 25°C unless otherwise noted.

INPUT SPECIFICATIONS

Input Voltage Range, 27V Nominal 8.5-100V
Input Filter ..... LC Network
Input Turn-On Voltage, 27V ..... 8.5 VDC max.
Input Undervoltage Shutdown, 27V ..... 8 VDC typ.
Input Overvoltage Shutdown, 27V ..... 105 VDC typ.

OUTPUT SPECIFICATIONS

Voltage Accuracy[1] ..... ±1.0%max.
Transient Response[2], Single, 25% step Load Change
±1% error band ..... <500u sec.
External Trim Adj. Range ..... ±10%
Short Circuit Protection ..... Continuous
Line Regulation[3] ..... ±1.0% max.
Load Regulation[4] ..... ±1.0% max.
Ripple and Noise, 20MHz BW[5] ..... 200mV p-p max.
Overvoltage Protection[6] 12V ..... 15V typ.

GENERAL SPECIFICATIONS

Efficiency ..... See Table
Switch Frequency 180KHz
Isolation Voltage,
Input to Output DC3000V
Input to FG DC2000V
Output to FG DC1000V
Isolation Resistance[7] ..... 10^8 Ohms min.
Over temperature shutdown point[8, 9] ..... 120°C typ.
Operation Temperature[10] ..... -40°C to +110°C
Storage Temperature Range ..... -55°C to +125°C
EMI/RFI Conducted[11] ..... EN55022 Level A/B
Dimensions ..... 2.28*1.45*0.5 inches
(57.91*36.8*12.70 mm)
Weight 48g

APPLICATIONS

Railway /Transportation System
Wireless Network
Telecom /Datacom System
Industry Control System
Workstation, Servers
Semiconductor Equipment

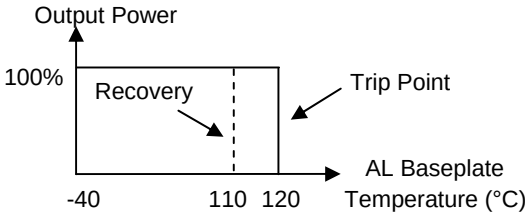
NOTE

1. Defined at the static output regulation at 25°C, including initial setting accuracy, Line voltage within stated limits and load current within stated limits.
2. di/dt= 100mA/1uS, Tc= 25°C; load change= 0.5 Io max. to 0.75 Io max. and 0.75 Io max. to 0.5 Io max.
3. Measured from high line to low line.
4. Measured from full load to 1/4 load.
5. Measured with 2PCS 22uF/25V X7R MLCC and a 47uF/25V POS-CAP. cross to output.
6. The converter will automatically restart after the overvoltage protection status be removed.
7. Measured with 500 VDC.
8. Non-latching shutdown protection with 10°C restart hysteresis.
9. Defined as the highest temperature measured at any one off the specified temperature hotspot checkpoints.
10. Defined as the temperature measured at Base-Plate.
11. Test with external Input filter.
12. A 100uF/250V E-Cap is recommended to be added in the input terminal to stabilize input voltage source.
13. This power module is not internally fused. An input line fuse must always be used.
14. Standard product is active low, active high remote On/Off option is available

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	INPUT CURRENT		TYPICAL EFFICIENCY(3)	Maximum Capacitive Load (uF)
				NO LOAD(1)	FULL LOAD(2)		
SUMRQ075EDP1201	27 VDC (8.5-100V)	12 VDC	6.25 A	15 mA	3.086 A	90 %	1500

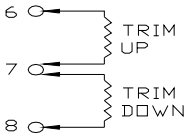
NOTE:
1. Typical value at nominal input voltage and full load.
2. Maximum value at nominal input voltage and full load.
3. Typical value at nominal input voltage and full load.
4. Vout nominal at full load (resistive load)

AL Baseplate temperature curve



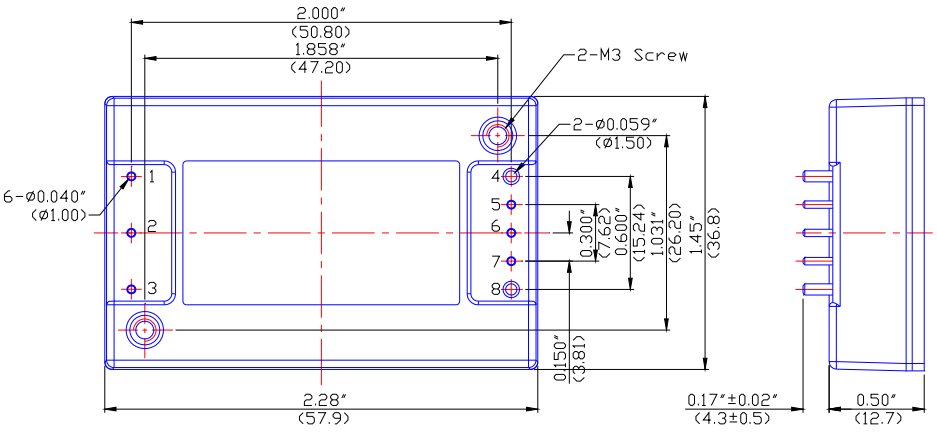
REMOTE ON/OFF CONTROL
Logic Compatibility ..... CMOS or Open Collector TTL
Negative Logic
Ec-ON ..... ＜+0.8 VDC or Short Circuit
Ec-OFF ..... ＞+2.5 VDC or Open Circuit
Positive Logic
Ec-ON ..... ＞+2.5 VDC or Open Circuit
Ec-OFF ..... ＜+0.8 VDC or Short Circuit
Control Common ..... Referenced to Input Minus

EXTERNAL OUTPUT TRIMMING
Output may optionally be externally trimmed with a fixed resistor or an external trimpot as shown.



OUTLINE DIMENSIONS

Enclosure Type

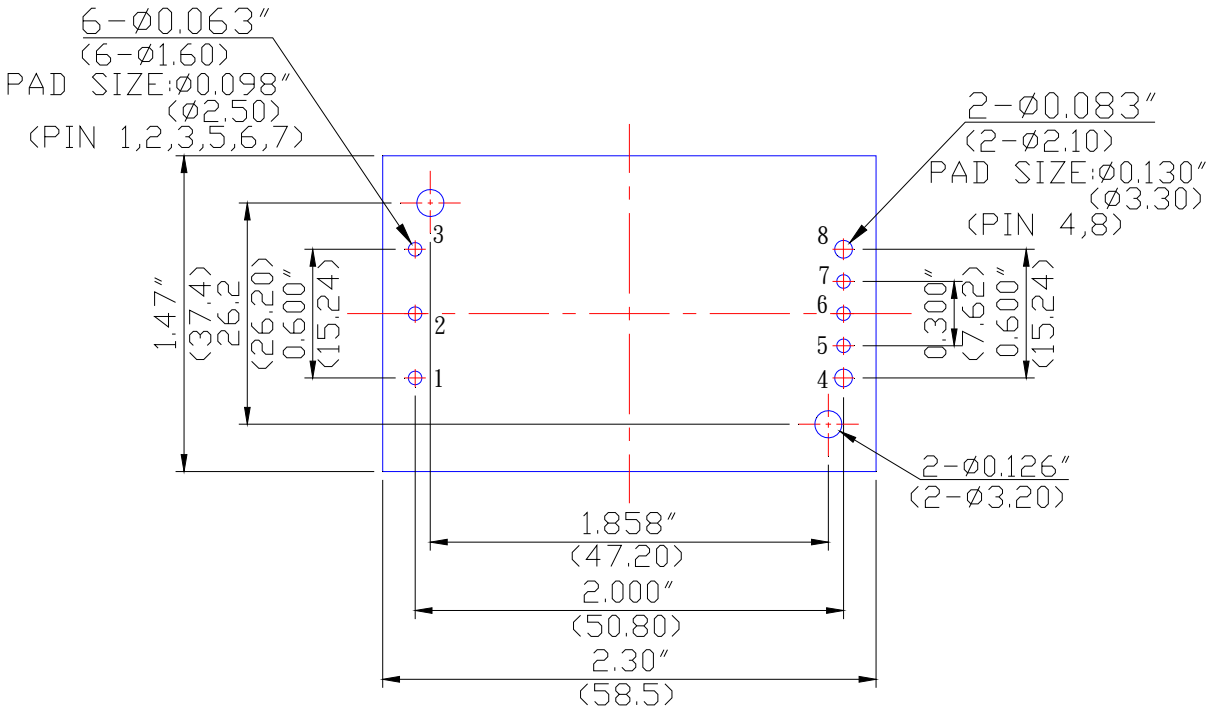


Pin Connections	
Pin	Function
1	-Vin
2	Remote On/Off Control
3	+Vin
4	-Vout
5	-Vsense
6	Trim
7	+Vsense
8	+Vout

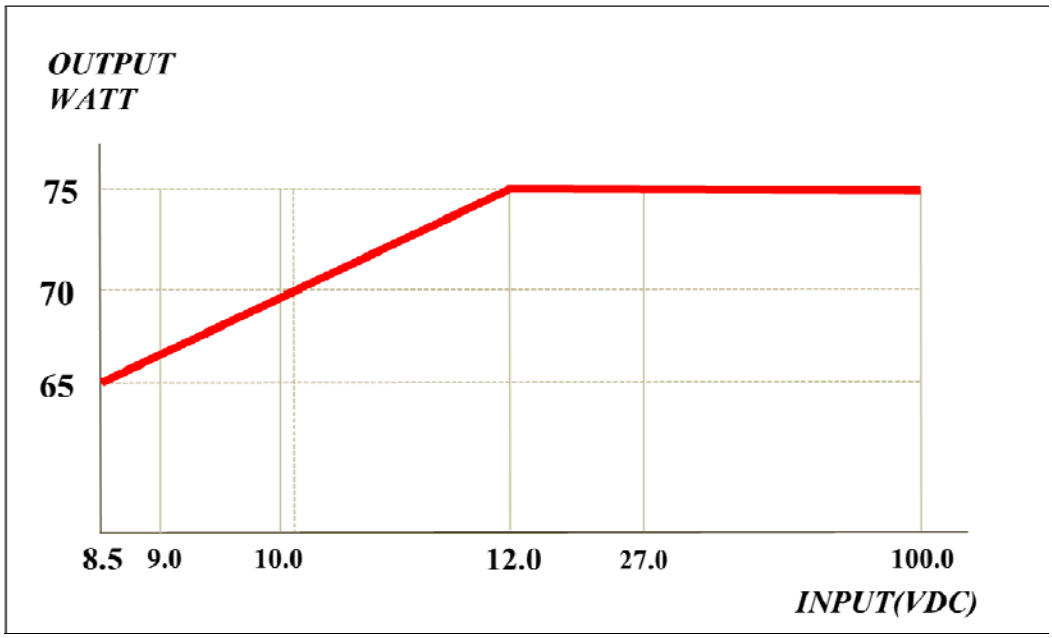
NOTE:
If remote sensing not utilized, output sense pin must be jumped to respective output power pins, for normal operation connect Pin NO.4 to Pin NO.5 and Pin NO.7 to Pin NO.8.

All dimensions in inches (mm).
Tolerance .xx= ±0.04”
.xxx=±0.02”

RECOMMEND PWB LAYOUT

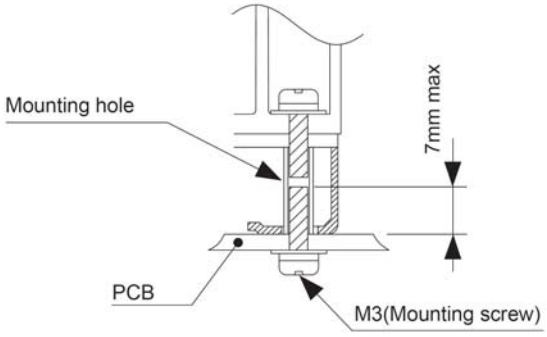


Power Derating Curve (O/P Power VS I/P Voltage)



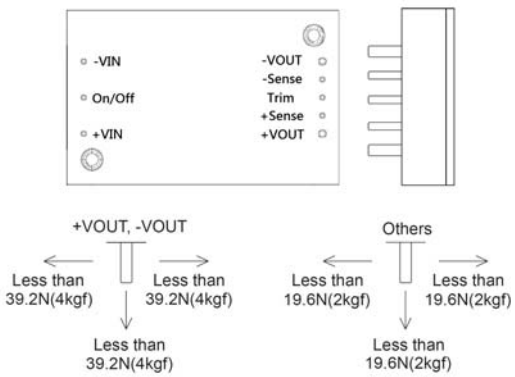
Mounting Method (PCB)

The power module works with conduction cooling and needs heat dissipation using heatsink. The power module is fixed to PCB by 2 position through the M3 tapped holes in the resin side, recommended torque is 5.5kgcm. The power module is fixed to the heatsink by 2 position through the M3 mounting tapped holes provide on the baseplate. It is recommended that the sequence to screw the 2 screws is in a diagonally manner and the recommended torque is 5.5kgcm. Make sure that PCB mounting screws do not touch the heatsink mounting screws.



Note:

1. Applying excessive stress to the input and output pins of the power module may damage internal connection. Avoid applying stress in excess of that show in below figure.
2. Input and output pins are soldered onto Internal PCB. Do not bend or pull the leads with excessive force.
3. As unexpected stress may be applied to the pins from vibration or shock, fix the power module by using the mounting holes with screws to reduce the stress.
4. Fix the power module to the PCB with screws before soldering the input and output pins to prevent the PCB pattern being damaged.



Typical Characteristics
12 V, 6.25A / 75 W

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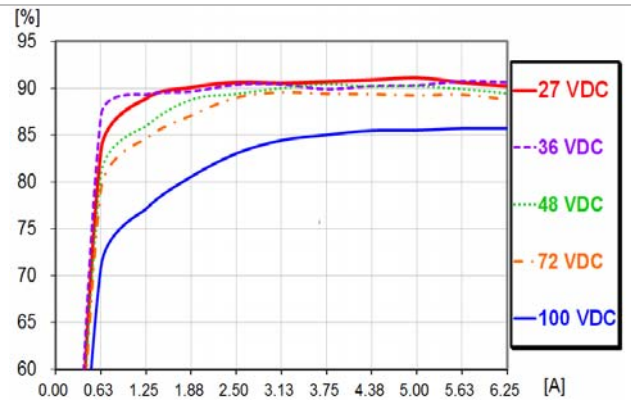
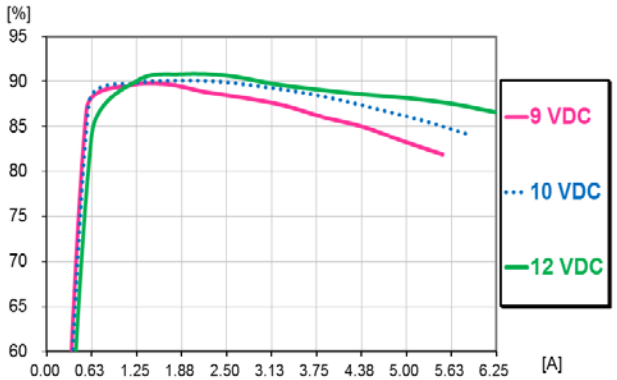
Efficiency Ⅰ



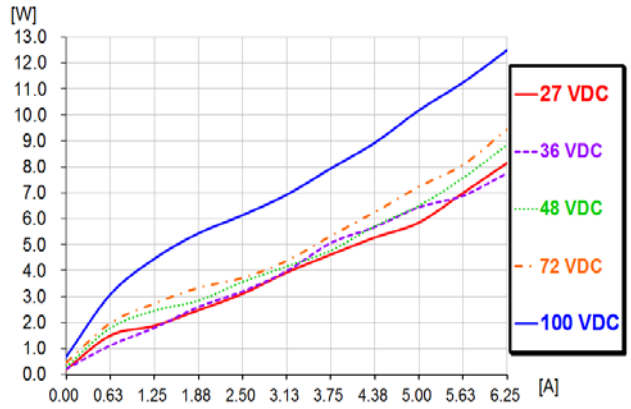
Efficiency vs. load current and input voltage at +25°C.

Efficiency Ⅱ



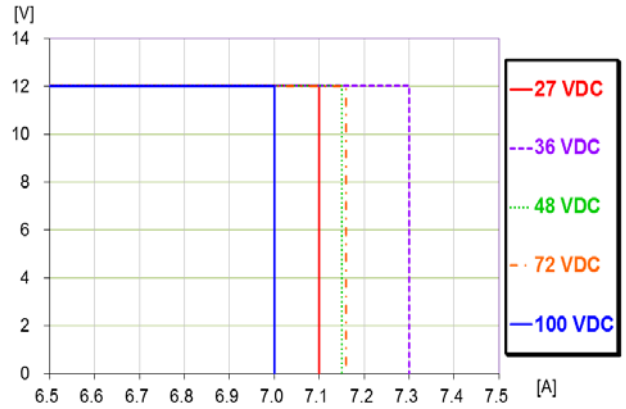
Dissipated power vs. load current and input voltage at +25°C.

Power Dissipation



Dissipated power vs. load current and input voltage at +25°C.

Current Limit Characteristics



Output voltage vs. load current at I_O > max I_O at +25°C.

Typical Characteristics
12 V, 6.25A / 75 W

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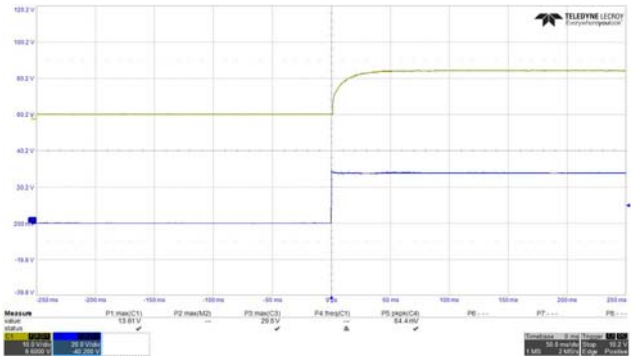
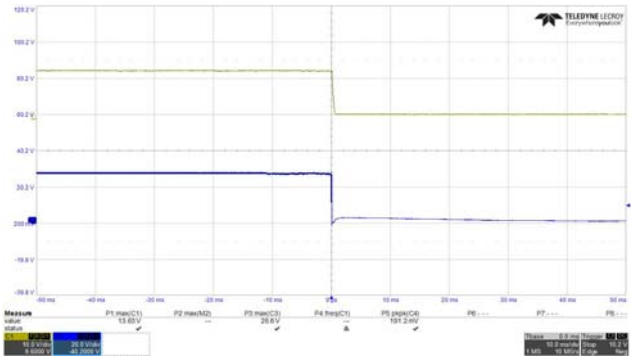
Start-up



Start-up enabled by connecting V_I at:
T_{P1} = +25°C, V_I = {27 V},
I_O = {6.25 A} resistive load.

Top trace: output voltage ({10 V/div.}).
Bottom trace: input voltage ({20 V/div.}).
Time scale: ({50 ms/div.}).

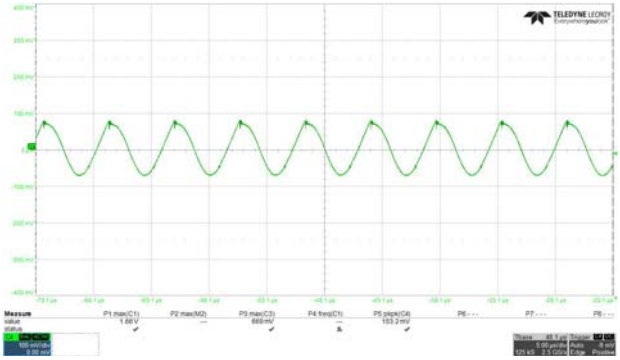
Shut-down



Shut-down enabled by disconnecting V_I at:
T_{P1} = +25°C, V_I = {27 V},
I_O = {6.25 A} resistive load.

Top trace: output voltage ({10 V/div.}).
Bottom trace: input voltage ({20 V/div.}).
Time scale: ({10 ms/div.}).

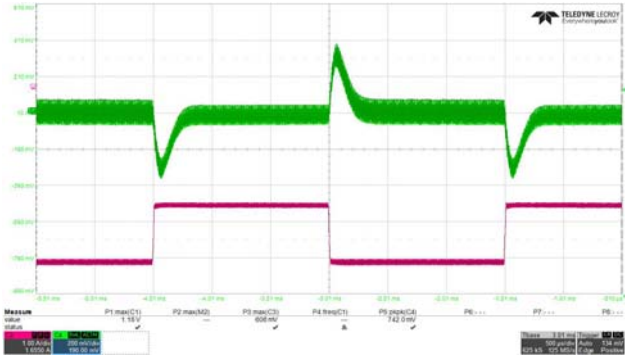
Output Ripple & Noise



Output voltage ripple at:
T_{P1} = +25°C, VI = {27 V},
I_O = {6.25 A} resistive load.

Trace: output voltage ({100 mV/div.}).
Time scale: ({5 µs/div.}).

Output Load Transient Response



Output voltage response to load current step-change ({3.125-4.6875-3.125 A}) at:
T_{P1} = +25°C, V_I = {27 V}.

Top trace: output voltage ({200 mV/div.}).
Bottom trace: load current ({1 A/div.}).
Time scale: ({500 us/div.}).

Output Voltage Adjust (TRIM UP/TRIM DOWN)

The resistor value for an adjusted output voltage is calculated by using the following equations:

Output Voltage Adjust, Increase:

$$R_{ADJ\_UP} = \left(\frac{7.246}{\Delta} - 62 \right) \text{ k}\Omega$$

Output Voltage Adjust, Decrease:

$$R_{ADJ\_DOWN} = \left(\frac{9.125}{\Delta} - 78.371 \right) \text{ k}\Omega$$

Output Voltage=12V

Example:

To trim up the 12V model by 8% to 12.96V the required external resistor is:

$$R_{ADJ\_UP} = \left(\frac{7.246}{0.08} - 62 \right) = 28.58\,\text{k}\Omega$$

Example:

To trim down the 12V model by 7% to 11.16V the required external resistor is:

$$R_{ADJ\_DOWN} = \left(\frac{9.125}{0.07} - 78.371 \right) = 51.99\,\text{k}\Omega$$

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