

Features

- 2:1 input voltage range
- 1.6kVDC isolation
- UL60950-1 certified
- Efficiency up to 87%
- Low profile, 10.2mm height
- Over current protection

Regulated Converter



RP08-A

8 Watt
DIP24/SMD
 Single and Dual Output



Description

The RP08-A series DC/DC converters are certified to UL60950-1 and cUL60950-1. This makes them ideal for all telecom and industrial applications where approved safety standards are required. The DIP24 package is available in both pinned and SMD case styles and meets military standards for thermal shock and vibration tolerance.

Selection Guide

Part Number	Input Voltage Range [VDC]	Output Voltage [VDC]	Output Current [mA]	Input Current (1) [mA]	Efficiency typ. (1) [%]	Max. Capacitive Load (2) [µF]
RP08-123.3SA (3)	9-18	3.3	2000	688	80	3300
RP08-1205SA (3)	9-18	5	1500	753	83	1600
RP08-1212SA (3)	9-18	12	666	757	88	350
RP08-1215SA (3)	9-18	15	533	766	87	240
RP08-243.3SA (3)	18-36	3.3	2000	344	80	3300
RP08-2405SA (3)	18-36	5	1500	377	83	1600
RP08-2412SA (3)	18-36	12	666	387	86	350
RP08-2415SA (3)	18-36	15	533	392	85	240
RP08-483.3SA (3)	36-75	3.3	2000	172	80	3300
RP08-4805SA (3)	36-75	5	1500	188	83	1600
RP08-4812SA (3)	36-75	12	666	194	86	350
RP08-4815SA (3)	36-75	15	533	194	86	240
RP08-1205DA (3)	9-18	±5	±800	803	83	±1000
RP08-1212DA (3)	9-18	±12	±333	766	87	±160
RP08-1215DA (3)	9-18	±15	±267	785	85	±100
RP08-2405DA (3)	18-36	±5	±800	407	82	±1000
RP08-2412DA (3)	18-36	±12	±333	387	86	±160
RP08-2415DA (3)	18-36	±15	±267	393	85	±100
RP08-4805DA (3)	36-75	±5	±800	196	85	±1000
RP08-4812DA (3)	36-75	±12	±333	191	87	±160
RP08-4815DA (3)	36-75	±15	±267	192	87	±100

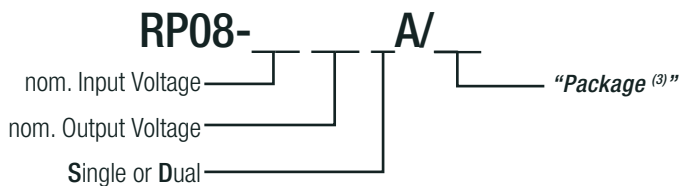
Notes:

- Note1: Maximum values at nominal input voltage and full load
 Note2: Max. Cap load is tested at minimum Input and constant resistive load



UL60950-1 certified
 EN55032 compliant

Model Numbering



Notes:

- Note3: no suffix for standard DIP24 package
 add suffix "/SMD" for SMD package

Ordering Examples

- RP08-4805SA/SMD = 48V Input, 5V Output, Single, SMD Package
 RP08-1205DA = 12V Input, 5V Output, Dual, DIP24 Package

Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

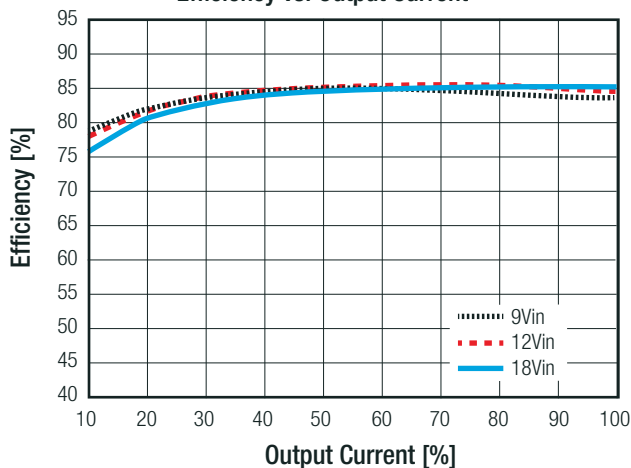
BASIC CHARACTERISTICS					
Parameter	Condition		Min.	Typ.	Max.
Internal Input Filter					Pi-Type
Input Voltage Range	nom. Vin = 12VDC nom. Vin = 24VDC nom. Vin = 48VDC		9VDC 18VDC 36VDC	12VDC 24VDC 48VDC	18VDC 36VDC 75VDC
Input Surge Voltage	100ms max.	nom. Vin = 12VDC nom. Vin = 24VDC nom. Vin = 48VDC			36VDC 50VDC 100VDC
Minimum Load ⁽⁴⁾			10%		
Start-up Time	Power up ON/OFF CTRL			700ms 5ms	
Operating Frequency Range			270kHz	300kHz	330kHz
ON/OFF CTRL ⁽⁵⁾ refer to "ON/OFF CTRL"	Positive Logic	DC-DC ON DC-DC OFF	Open or 3.0VDC < V _{CTRL} < 12VDC Short or 0VDC < V _{CTRL} < 1.2VDC		
Input Current of CTRL pin	drive current	I _{CTRL}	-0.5mA		+0.5mA
Standby Current	DC-DC OFF	I _{in}		2.5mA	
Output Ripple and Noise	20MHz BW			50mVp-p	
Input Reflected Ripple Current				20mA _{p-p}	

Notes:

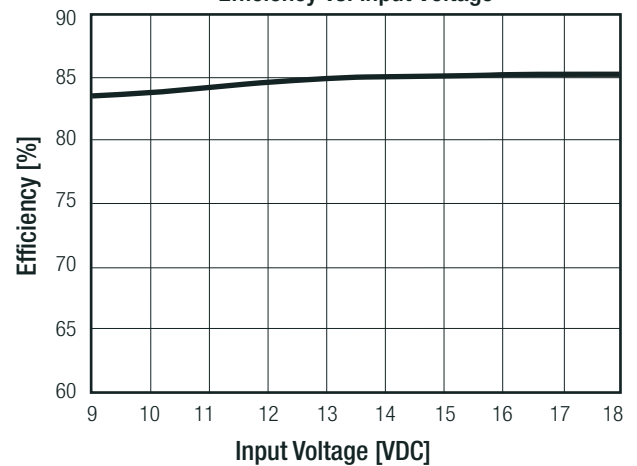
- Note4: The RP08 series requires a minimum of 10% loading on the output to maintain specified regulation
Operation under no-load condition will not damage these devices, however they may not meet all listed specification
- Note5: The pin voltage is referenced to -Vin pin

RP08-1205SA

Efficiency vs. Output Current



Efficiency vs. Input Voltage

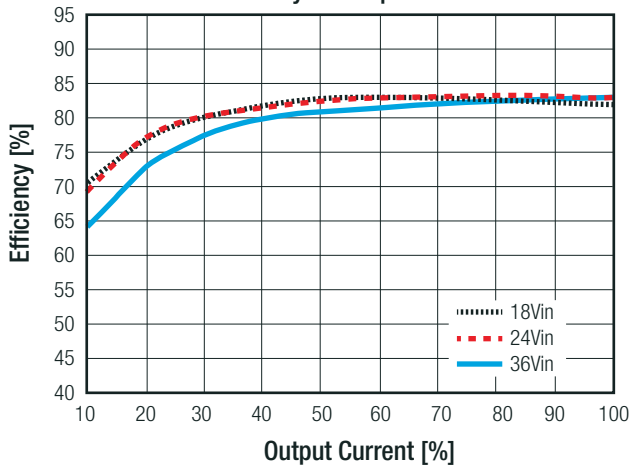


continued on next page

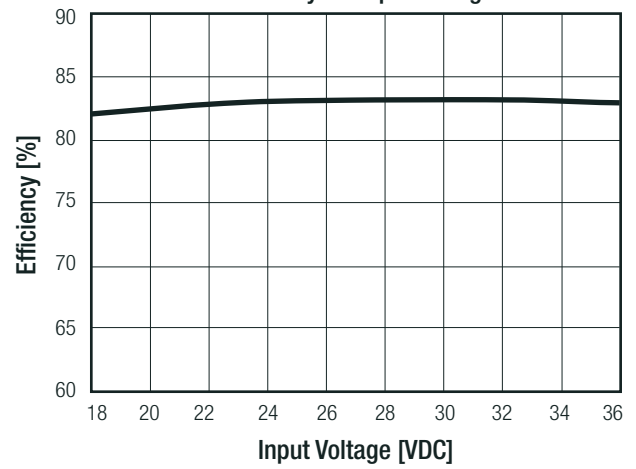
Specifications (measured @ $T_a = 25^\circ\text{C}$, nom. V_{in} , full load and after warm-up unless otherwise stated)

RP08-2405SA

Efficiency vs. Output Current

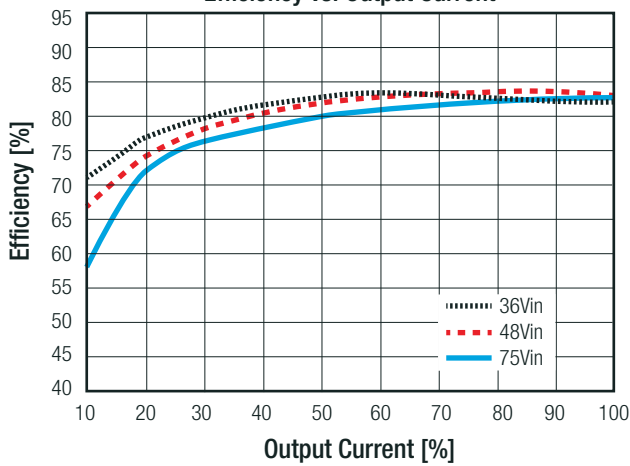


Efficiency vs. Input Voltage

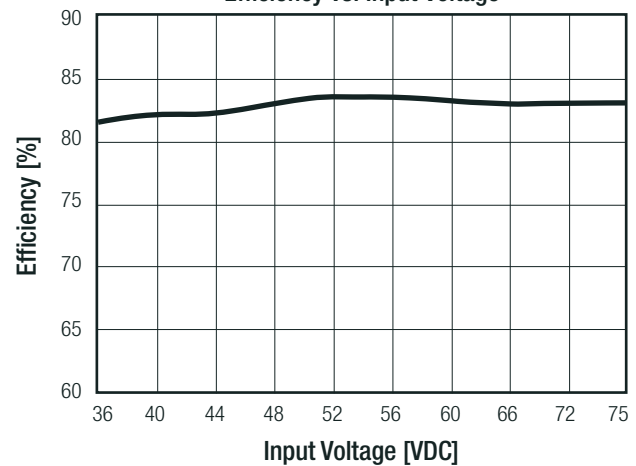


RP08-4805SA

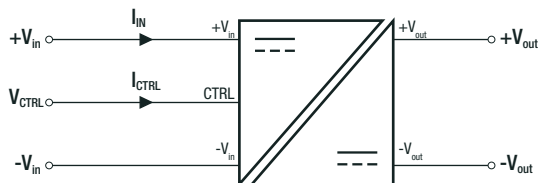
Efficiency vs. Output Current



Efficiency vs. Input Voltage



ON/OFF CTRL



Positive Logic

DC-DC ON
DC-DC OFF

Open or $3.0\text{VDC} < V_{CTRL} < 12\text{VDC}$
Short or $0\text{VDC} < V_{CTRL} < 1.2\text{VDC}$

REGULATIONS

Parameter	Condition		Value
Output Accuracy			$\pm 1.0\%$ max.
Line Regulation	low line to high line, full load		$\pm 0.2\%$ max.
Load Regulation	Single (0% to 100% load)	DIP24 SMD	$\pm 0.5\%$ $\pm 1.0\%$
	Dual (0% to 100% load)	DIP24, SMD	$\pm 1.0\%$
Cross Regulation	asymmetrical 25% \leftrightarrow 100% load		$\pm 5.0\%$
Transient Response Recovery Time	25% load step change		200 μs typ.

Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

PROTECTIONS

Parameter	Condition		Value
Short Circuit Protection (SCP)			continuous, automatic recovery
Over Load Protection (OLP)	% of lout rated		150% typ.
Isolation Voltage ⁽⁶⁾	DIP24	I/P to O/P; I/P (O/P) to case	1.6kVDC/1 minute
	SMD	I/P to O/P I/P (O/P) to case	1.6kVDC/1 minute 1.0kVDC/1 minute
Isolation Resistance	Viso= 500VDC		1GΩ min.
Isolation Capacitance			300pF max.

Notes:

Note6: For repeat Hi-Pot testing, reduce the time and/or the test voltage

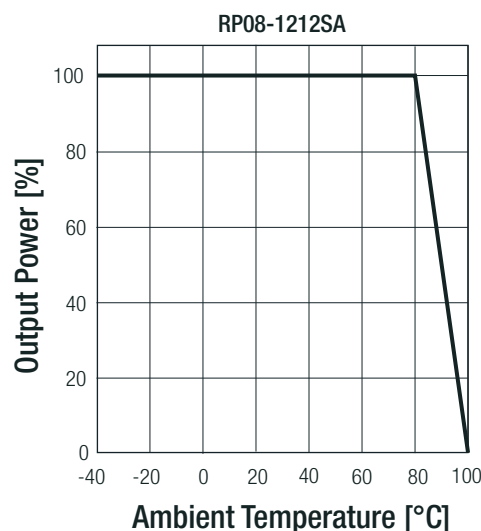
Note7: This power module is not internally fused. An input line fuse must always be used

Recom suggests: 12Vin=T2A; 24Vin=T1A; 48Vin=T0.5A slow blow

ENVIRONMENTAL

Parameter	Condition	Value
Operating Temperature Range	without derating	-40°C to +80°C
	with derating	-40°C to +100°C
Maximum Case Temperature		+100°C
Temperature Coefficient		±0.02%/K max.
Thermal Impedance	@ natural convection 0.1m/s	20K/W typ.
Operating Altitude		4000m
Operating Humidity	non-condensing	5% - 95% RH
Pollution Degree		PD2
Shock		according to MIL-STD-810F
Vibration		according to MIL-STD-810F
MTBF	MIL-HDBK-217F, G.B.	3543 x 10 ³ hours
	BELLCORE TR-NWT-000332 ⁽⁸⁾	3165 x 10 ³ hours

Derating Graph ⁽⁹⁾



Notes:

Note8: BELLCORE TR-NWT-000332. Case I: 50% Stress, Temperature at 40°C (Ground fixed and controlled environment)

Note9: Derating graphs are valid only for the shown part numbers. If you need detailed derating-information about a part-number not shown here please contact RECOM Techsupport for detailed information

Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

SAFETY AND CERTIFICATIONS

Certificate Type (Safety)	Condition	Standard
Information Technology Equipment, General Requirements for Safety	E196683	UL60950-1, 2nd Edition, 2014 C22.2 No. 60950-1-07, 2nd Edition, 2014
EAC	RU-AT.49.09571	TP TC 004/2011
RoHS2+		RoHS-2011/65/EU + AM-2015/863

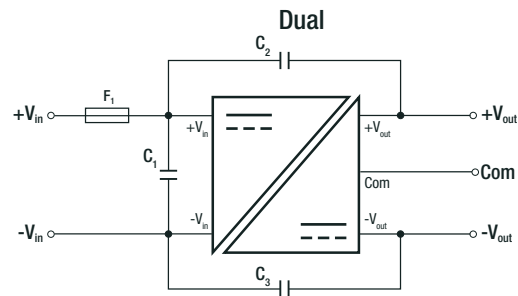
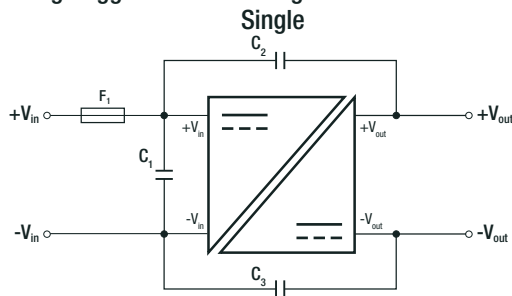
EMC Compliance

EMC Compliance	Condition	Standard / Criterion
Electromagnetic compatibility of multimedia equipment - Emission requirements	with external filter (see filter suggestion below)	EN55032, Class A and B
ESD Electrostatic discharge immunity test	Air ±8kV and Contact ±6kV	EN61000-4-2, Criteria A
Radiated, radio-frequency, electromagnetic field immunity test	10 V/m	EN61000-4-3, Criteria A
Fast Transient and Burst Immunity ⁽¹⁰⁾	±2kV	EN61000-4-4, Criteria A
Surge Immunity ⁽¹⁰⁾	±1kV	EN61000-4-5, Criteria A
Immunity to conducted disturbances, induced by radio-frequency fields	10 Vr.m.s	EN61000-4-6, Criteria A
Power Magnetic Field Immunity	100A/m continuous; 1000A/m 1s	EN61000-4-8, Criteria A

Notes:

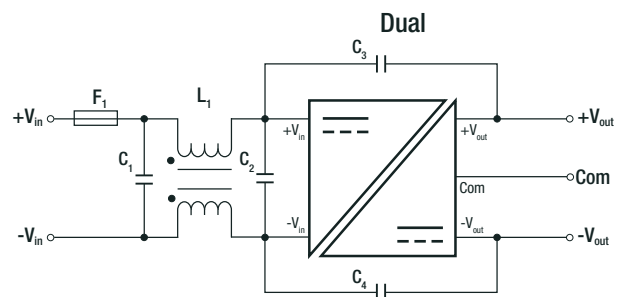
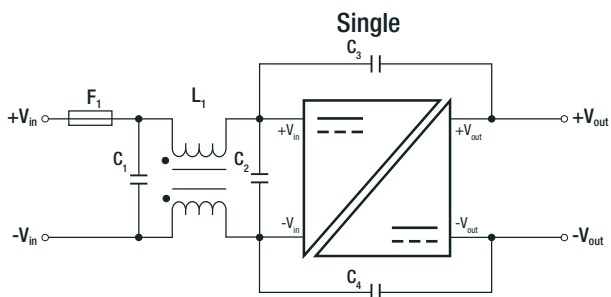
Note10: An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5
Recom suggests Nippon chemi-con KY series 220µF/100V

EMC Filtering Suggestions according to EN55032



Component List Class A

MODEL	C1	C2/C3
RP08-12xxS_DA, RP08-12xxS_DA/SMD	4.7µF/25V, 1210 MLCC	1000pF/2kV, 1206 MLCC
RP08-24xxS_DA, RP08-24xxS_DA/SMD	N/A	1000pF/2kV, 1206 MLCC
RP08-48xxS_DA, RP08-48xxS_DA/SMD	N/A	1000pF/2kV, 1206 MLCC



Component List Class B

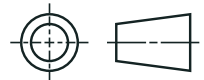
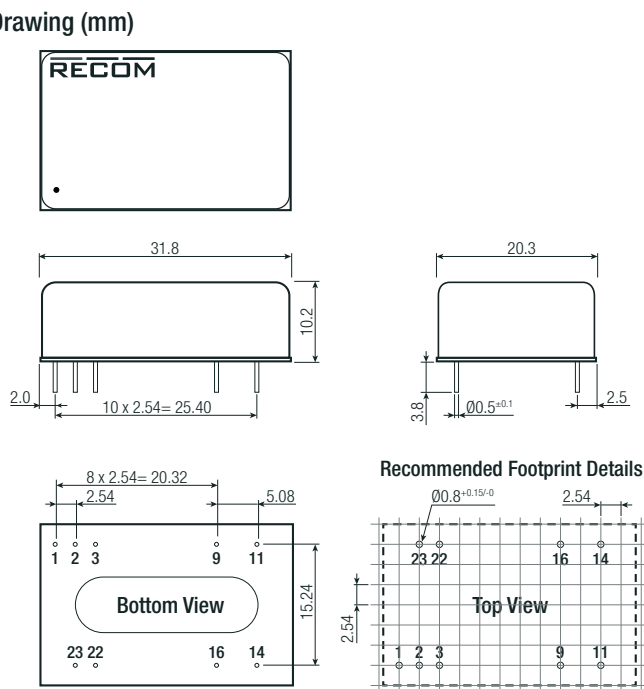
MODEL	C1	C2	C3/C4	L1
RP08-12xxS_DA RP08-12xxS_DA/SMD	4.7µF/25V, 1210 MLCC	N/A	1000pF/2kV, 1206 MLCC	CMC :325µH ref: WE 744290321 or CMC-06
RP08-24xxS_DA RP08-24xxS_DA/SMD	6.8µF/50V, 1812 MLCC	N/A	1000pF/2kV, 1206 MLCC	CMC: 325µH ref: WE 744290321 or CMC-06
RP08-48xxS_DA RP08-48xxS_D/SMD	2.2µF/100V, 1812 MLCC	2.2µF/100V, 1812 MLCC	1000pF/2kV, 1206 MLCC	CMC: 325µH ref: WE 744290321 or CMC-06

Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

DIMENSIONS AND PHYSICAL CHARACTERISTICS

Parameter	Type	Value
Material	case	nickel coated copper
	base	non-conductive black plastic
	potting	epoxy (UL94 V-0)
Dimensions (LxWxH)	DIP24	31.8 x 20.3 x 10.2mm
	SMD	32.0 x 20.3 x 11.2mm
Weight	DIP24	16g
	SMD	18g

DIP24 Dimension Drawing (mm)

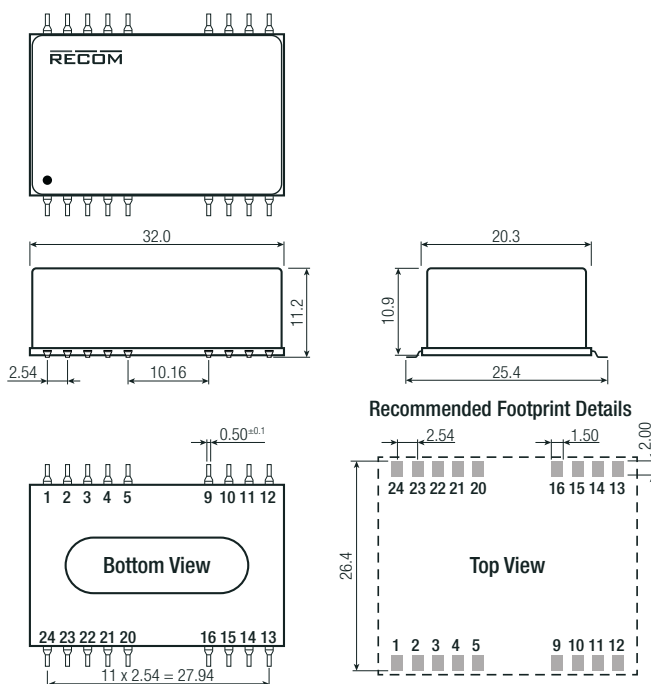


Pin Connections DIP24

Pin #	Single	Dual
1	CTRL	CTRL
2	-Vin	-Vin
3	-Vin	-Vin
9	NC	Com
11	NC	-Vout
14	+Vout	+Vout
16	-Vout	Com
22	+Vin	+Vin
23	+Vin	+Vin

NC = No Connection
Pin Pitch Tolerance ±0.25mm
xx.x = ±0.5mm
xx.xx = ±0.25mm

SMD Dimension Drawing (mm)



Pin Connections SMD

Pin #	Single	Dual
1	CTRL	CTRL
2	-Vin	-Vin
3	-Vin	-Vin
9	NC	Com
11	NC	-Vout
14	+Vout	+Vout
16	-Vout	Com
22	+Vin	+Vin
23	+Vin	+Vin
Others	NC	NC

NC = No Connection
Pin Pitch Tolerance ±0.25mm
xx.x = ±0.5mm
xx.xx = ±0.25mm

Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

PACKAGING INFORMATION			
Parameter	Type		Value
Packaging Dimension (LxWxH)	tube	DIP24	255.0 x 23.0 x 19.0mm
		SMD	255.0 x 32.0 x 16.0mm
Packaging Quantity	DIP24, SMD		7pcs
Storage Temperature Range			-55°C to +125°C
Storage Humidity	non-condensing		5% - 95% RH

The product information and specifications may be subject to changes even without prior written notice. The product has been designed for various applications; its suitability lies in the responsibility of each customer. The products are not authorized for use in safety-critical applications without RECOM's explicit written consent. A safety-critical application is an application where a failure may reasonably be expected to endanger or cause loss of life, inflict bodily harm or damage property. The applicant shall indemnify and hold harmless RECOM, its affiliated companies and its representatives against any damage claims in connection with the unauthorized use of RECOM products in such safety-critical applications.