

General

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Efficiency	92	93		%	Measured from 342 to 528 VAC, 5V Standby at full load.
Isolation: Input to Output Input to Ground Output to Ground	4000			VAC	2 x MOPP. Barrier only ⁽¹⁾
	1500			VAC	1 x MOPP
	500			VDC	
Switching Frequency	55	60	65	kHz	Fixed frequency PFC
	40		250	kHz	Variable frequency main converter
Power Density			15.38	W/in ³	
Signals and Controls					V Program, I Program, AC OK, DC OK, Fan Fail/Temperature Warning, Sync, PMBus, Inhibit, Current Share.
MTBF		600		kHrs	Telcordia 332
Weight		12.5 (5.7)		lb (kg)	

1. For test at 4000 VAC, GDTs must be removed. -M versions available with installation Class 3 surge only. See models and ratings table.

Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Operating Temperature	-20		+70	°C	Derate linearly from 50°C to 50% rated power at 70 °C
Storage Temperature	-40		+85	°C	
Cooling					Force-cooled with intelligent fan speed control
Humidity	5		95	%RH	Non-condensing
Operating Altitude			3000	m	Medical
			5000	m	IT
Transport Altitude			10000	m	
Shock	±3 x 30 g shocks in each plane, total 18 shocks. 30 g = 11 ms (±0.5 ms) half sine. Conforms to EN60068-2-27 & EN60068-2-47				
Vibration	Single axis 10-500 Hz at 2 g sweep and endurance at resonance in all 3 planes. Conforms to EN60068-2-6				
Acoustic Noise	< 70 db(A) Lw				

Signals & Controls

	Function
V Program ⁽¹⁾⁽²⁾	0V to 5V signal will program Vout from 0-105%. VProg accuracy ±3% of nominal output voltage. When left open, supply will go into its default operating mode.
I Program ⁽¹⁾⁽²⁾	0V to 5V signal will program the current limit from 0-110%. When this signal is left open, supply will go into its default operating mode. IProg accuracy ±3% of maximum rating.
AC OK	LOW = Input Voltage is within operating range, HIGH = Input Voltage is outside of operating range or there is a loss of phase. Uncommitted opto-transistor, 2 ms warning time
DC OK	When the supply is used as a variable output supply, this signal is disabled. When the supply is programmed as a fixed output supply, LOW = Vout > 95% of Vnominal. This level is programmable by the user through the PMBus. Uncommitted opto-transistor
Fan Fail/Temp Warning	High = Fan FAIL and/or overtemperature, Low = Fan OK and temperature OK (3.3V Logic), unit switches off 10 s after Fan Fail/Temp Warning alarm, auto recovery. XP GUI available for download, contact sales.
Sync.	Connect parallel units to synchronise output turn on.
PMBus, CANopen and RS485 Optional: RS485 can be replaced with RS232 or UART	The interface specification is detailed in a separate document "HPT5K0 Communication, Control and Status Specification". XP GUI available for download, contact sales. Vout monitor accuracy is ±1% of nominal voltage, Vout setting accuracy is ±1% of nominal voltage, Iout monitor accuracy is ±3% of full load, Iout setting accuracy is ±3% of full load.
Current Share	Connecting pin 23 on one unit to pin 23 on a like voltage unit will force the current to be shared. Up to 5 units can be paralleled. Current share accuracy ±3% of full system load.
Inhibit	Uncommitted opto diode. See Signals & Controls pg 6.

⁽¹⁾ In analog mode, the default Vout and Iout settings are 0% when open circuit.

⁽²⁾ To activate analog mode, PMBus_EN (pin 24) must be pulled down to 5VSBY-RTN. Default when open is digital programming.

EMC: Emissions

Phenomenon	Standard	Test Level	Notes & Conditions
Conducted	EN55011/EN55032	Class B	
Radiated	EN55011/EN55032	Class A	
Harmonic Currents	EN61000-3-2	Class A	
Voltage Flicker	EN61000-3-3		

EMC: Immunity

Phenomenon	Standard	Test Level	Criteria	Notes & Conditions
ESD Immunity	EN61000-4-2	4	A	±8 kV contact / ±15 kV air discharge
Radiated Immunity	EN61000-4-3	3	A	
EFT/Burst	EN61000-4-4	3	A	
Surge	EN61000-4-5	Installation class 4	A	
Conducted	EN61000-4-6	4	A	
Magnetic Field	EN61000-4-8	4	A	
Dips and Interruptions	EN61000-4-11 (200/380 VAC)	Dip 100% (0 VAC), 8.4ms	A	
		Dip 100% (0 VAC), 16.7ms	A	
		Dip 60% (80/152 VAC), 200ms	A	
		Dip 30% (140/266 VAC), 500ms	A	
		Dip 20% (160/304 VAC), 5000ms	B	
		Int 100% (0 VAC), 5000ms	B	
	EN61000-4-11 (240/480 VAC)	Dip 100% (0 VAC), 10ms	A	
		Dip 100% (0 VAC), 20ms	A	
		Dip 60% (96/192 VAC), 200ms	A	
		Dip 30% (168/336 VAC), 500ms	A	
		Dip 20% (192/384 VAC), 5000ms	B	
		Int 100% (0 VAC), 5000ms	B	
	EN60601-1-2 (200/380 VAC)	Dip 100% (0 VAC), 10ms	A	
		Dip 100% (0 VAC), 20ms	A	
		Dip 60% (80/152 VAC), 100ms	A	
		Dip 30% (140/266 VAC), 500ms	A	
		Int 100% (0 VAC), 5000ms	B	
	EN60601-1-2 (240/480 VAC)	Dip 100% (0 VAC), 10ms	A	
		Dip 100% (0 VAC), 20ms	A	
		Dip 60% (96/192 VAC), 100ms	A	
		Dip 30% (168/336 VAC), 500ms	A	
		Int 100% (0 VAC), 5000ms	B	
	SEMI F47 (200/380 VAC)	Dip 22% (156/269 VAC), 1000ms	A	
		Dip 33% (134/254 VAC), 500ms	A	
		Dip 55% (90/171 VAC), 200ms	A	

Safety Approvals

Safety Agency	Safety Standard	Notes & Conditions
CB Report	IEC62368-1 Ed 2	Information Technology
	IEC60601-1 Ed 3 Including Risk Management	Medical
UL	UL62368-1, CSA 22.2 No.62368-1, UL60950-1	Information Technology
	ANSI/AAMI ES60601-1:2005 & CSA C22.2, No.60601-1:08	Medical
TUV	EN62368-1	Information Technology
	EN60601-1/2006	Medical
CE	LVD & RoHS	
Equipment Protection Class	Class I	See safety agency conditions of acceptability for details

Means of Protection		Category
Primary to Secondary	2 x MOPP (Means of Patient Protection)	IEC60601-1 Ed 3
Primary to Earth	1 x MOPP (Means of Patient Protection)	
Secondary to Earth	N/A	