



■ Features

- Ultra compact and 1U low profile(25mm)
- 4:1 wide input range
- No minimum load required
- Protections: Short circuit / Overload / Over voltage / Input reverse polarity
- 4000VDC I/O isolation (Reinforced isolation)
- Half encapsulated , cooling by free air convection
- -40~+70°C wide working temperature
- Built-in constant current limiting circuit
- LED indicator for power on

■ Applications

- Bus, tram, metro or railway system
- Highly vibrating, highly dusty, extremely low or high temperature harsh environment
- Wireless network
- Telecom or datacom system
- Industry control system

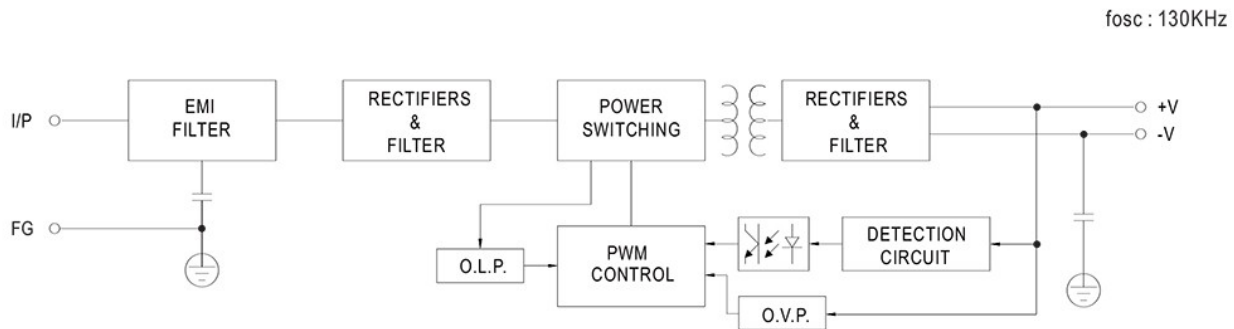
SPECIFICATION

MODEL		ASIRE60G-3.3	ASIRE60G-5	ASIRE60G-12	ASIRE60G-24	ASIRE60L-3.3	ASIRE60L-5	ASIRE60L-12	ASIRE60L-24	
OUTPUT	DC VOLTAGE	3.3V	5V	12V	24V	3.3V	5V	12V	24V	
	RATED CURRENT	12A	12A	5A	2.5A	12A	12A	5A	2.5A	
	CURRENT RANGE	0 ~ 12A	0 ~ 12A	0 ~ 5A	0 ~ 2.5A	0 ~ 12A	0 ~ 12A	0 ~ 5A	0 ~ 2.5A	
	RATED POWER	39.6W	60W	60W	60W	39.6W	60W	60W	60W	
	RIPPLE & NOISE (max.) Note.2	60mVp-p	100mVp-p	50mVp-p	50mVp-p	60mVp-p	60mVp-p	50mVp-p	50mVp-p	
	VOLTAGE TOLERANCE Note.3	±2.0%	±2.0%	±2.0%	±2.0%	±2.0%	±2.0%	±2.0%	±2.0%	
	LINE REGULATION	±0.5%	±0.5%	±0.3%	±0.2%	±0.5%	±0.5%	±0.3%	±0.2%	
	LOAD REGULATION	±0.5%	±0.5%	±0.3%	±0.2%	±0.5%	±0.5%	±0.3%	±0.2%	
SETUP, RISE TIME		100ms, 60ms at full load								
HOLD UP TIME (Typ.)		Please refer to page 5 Hold up Time(Load de-rating curve)								
INPUT	VOLTAGE RANGE CONTINUOUS	9 ~ 36VDC					18 ~ 72VDC			
	EFFICIENCY (Typ.)	86.5%	88%	92%	90%	88.5%	89%	93%	91.5%	
	DC CURRENT (Typ.)	2.1A/24VDC					0.95A/48VDC			
	INRUSH CURRENT (Typ.)	20A/24VDC					20A/48VDC			
	INTERRUPTION OF VOLTAGE SUPPLY	EN50155:2007-G type comply with S1 level(3ms) @full load,S2 level(10ms) @50% load; L type comply with S2 level(10ms) @full load EN50155:2017-Comply with S1 level								
PROTECTION	OVERLOAD	105 ~ 135% rated output power Protection type : Constant current limiting, recovers automatically after fault condition is removed								
	OVER VOLTAGE	4.3 ~ 5.3V	5.75 ~ 7V	13.8 ~ 16.2V	27.6 ~ 32.4V	4.3 ~ 4.95V	5.75 ~ 7V	13.8 ~ 16.2V	27.6 ~ 32.4V	
		Protection type : Shut down o/p voltage, re-power on to recover								
ENVIRONMENT	WORKING TEMP.	-40 ~ +55℃ (no derating) ; +70℃ @ 60% load by free air convection ; +70℃ (no derating with external base plate)								
	WORKING HUMIDITY	5 ~ 95% RH non-condensing								
	STORAGE TEMP.	-40 ~ +85℃								
	TEMP. COEFFICIENT	±0.03%/℃ (0 ~ 50℃)								
	VIBRATION	10 ~ 500Hz, 5G 10min./1cycle, 60min. each along X, Y, Z axes ; Mounting : compliance to IEC61373								
	OPERATING ALTITUDE	5000 meters								
SAFETY & EMC (Note 4)	SAFETY STANDARDS	IEC 62368-1, UL 62368-1, AS/NZS 62368-1, EAC TP TC 004 approved, Design refer to BS EN/EN62368-1								
	WITHSTAND VOLTAGE	I/P-O/P:4KVDC I/P-FG:2.5KVDC O/P-FG:2.5KVDC								
	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25℃ / 70% RH								
	EMC EMISSION	Parameter	Standard				Test Level / Note			
		Conducted	BS EN/EN55032				Class A			
		Radiated	BS EN/EN55032				Class B			
		Harmonic Current	BS EN/EN61000-3-2				-----			
		Voltage Flicker	BS EN/EN61000-3-3				-----			
	EMC IMMUNITY	BS EN/EN55035								
		Parameter	Standard				Test Level / Note			
ESD		BS EN/EN61000-4-2				Level 3, ±8KV air ; Level 3, ±6KV contact				
Radiated Field		BS EN/EN61000-4-3				Level X, 20V/m				
EFT / Burst		BS EN/EN61000-4-4				Level 3, 2KV at power Level 4, 2KV at signal				
Surge		BS EN/EN61000-4-5				Level 3, 1KV Line-Line, Level 3, 2KV Line-Earth				
Conducted		BS EN/EN61000-4-6				Level 3				
RAILWAY STANDARD	Compliance to BS EN/EN45545-2 for fire protection ; BS EN/EN50155 / IEC60571 including IEC61373 for shock & vibration, BS EN/EN50121-3-2 for EMC									
OTHERS	MTBF	2738.8K hrs min. Telcordia SR-332 (Bellcore) ; 593.9K hrs min. MIL-HDBK-217F (25℃)								
	DIMENSION	128*60*25mm (L*W*H)								
	PACKING	0.29Kg; 48pcs/14.9Kg/0.75CUFT								
NOTE	1. All parameters NOT specially mentioned are measured at 24,48VDC input, rated load and 25℃ of ambient temperature. 2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor. 3. Tolerance : includes set up tolerance, line regulation and load regulation. 4. The power supply is considered a component which will be installed into a final equipment. All the EMC tests are been executed by mounting the unit on a 360mm*360mm metal plate with 1mm of thickness. The final equipment must be re-confirmed that it still meets EMC directives. 5. Strongly recommended that external output capacitance should not exceed 5000uF. 6. The ambient temperature derating of 3.5℃/1000m with fanless models and of 5℃/1000m with fan models for operating altitude higher than 2000m(6500ft).									

SPECIFICATION

MODEL		ASIRE60H-3.3		ASIRE60H-5		ASIRE60H-12		ASIRE60H-24	
OUTPUT	DC VOLTAGE	3.3V		5V		12V		24V	
	RATED CURRENT	12A		12A		5A		2.5A	
	CURRENT RANGE	0 ~ 12A		0 ~ 12A		0 ~ 5A		0 ~ 2.5A	
	RATED POWER	39.6W		60W		60W		60W	
	RIPPLE & NOISE (max.) Note.2	80mVp-p		60mVp-p		50mVp-p		50mVp-p	
	VOLTAGE TOLERANCE Note.3	±2.0%		±2.0%		±2.0%		±2.0%	
	LINE REGULATION	±0.5%		±0.5%		±0.3%		±0.2%	
	LOAD REGULATION	±0.5%		±0.5%		±0.3%		±0.2%	
	SETUP, RISE TIME	100ms, 60ms at full load							
HOLD UP TIME (Typ.)	Please refer to page 5 Hold up Time(Load de-rating curve)								
INPUT	VOLTAGE RANGE CONTINUOUS	40 ~ 160VDC							
	EFFICIENCY (Typ.)	87.5%		89%		92.5%		91.5%	
	DC CURRENT (Typ.)	0.415A/110VDC		0.62A/110V					
	INRUSH CURRENT (Typ.)	20A/110VDC							
	INTERRUPTION OF VOLTAGE SUPPLY	EN50155:2007-H-type comply with S2 level(10ms) @ full load EN50155:2017-Comply with S1 level							
PROTECTION	OVERLOAD	105 ~ 135% rated output power Protection type : Constant current limiting, recovers automatically after fault condition is removed							
	OVER VOLTAGE	4.3 ~ 4.95V		5.75 ~ 7V		13.8 ~ 16.2V		27.6 ~ 32.4V	
		Protection type : Shut down o/p voltage, re-power on to recover							
ENVIRONMENT	WORKING TEMP.	-40 ~ +55°C (no derating) ; +70°C @ 60% load by free air convection ; +70°C (no derating with external base plate)							
	WORKING HUMIDITY	5 ~ 95% RH non-condensing							
	STORAGE TEMP.	-40 ~ +85°C							
	TEMP. COEFFICIENT	±0.03%/°C (0 ~ 50°C)							
	VIBRATION	10 ~ 500Hz, 5G 10min./1cycle, 60min. each along X, Y, Z axes ; Mounting : compliance to IEC61373							
	OPERATING ALTITUDE	5000 meters							
SAFETY & EMC (Note 4)	SAFETY STANDARDS	IEC 62368-1, UL 62368-1, AS/NZS 62368-1, EAC TP TC 004 approved, Design refer to BS EN/EN62368-1							
	WITHSTAND VOLTAGE	I/P-O/P:4KVDC I/P-FG:2.5KVDC O/P-FG:2.5KVDC							
	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25°C / 70% RH							
	EMC EMISSION	Parameter	Standard				Test Level / Note		
		Conducted	BS EN/EN55032				Class A		
		Radiated	BS EN/EN55032				Class B		
		Harmonic Current	BS EN/EN61000-3-2				-----		
		Voltage Flicker	BS EN/EN61000-3-3				-----		
	EMC IMMUNITY	BS EN/EN55035							
		Parameter	Standard				Test Level / Note		
ESD		BS EN/EN61000-4-2				Level 3, ±8KV air ; Level 3, ±6KV contact			
Radiated Field		BS EN/EN61000-4-3				Level X, 20V/m			
EFT / Burst		BS EN/EN61000-4-4				Level 3, 2KV at power Level 4, 2KV at signal			
Surge		BS EN/EN61000-4-5				Level 3, 1KV Line-Line, Level 3, 2KV Line-Earth			
Conducted		BS EN/EN61000-4-6				Level 3			
RAILWAY STANDARD	Compliance to BS EN/EN45545-2 for fire protection ; BS EN/EN50155 / IEC60571 including IEC61373 for shock & vibration, BS EN/EN50121-3-2 for EMC								
OTHERS	MTBF	2738.8K hrs min. Telcordia SR-332 (Bellcore) ; 593.9K hrs min. MIL-HDBK-217F (25°C)							
	DIMENSION	128*60*25mm (L*W*H)							
	PACKING	0.29Kg; 48pcs/14.9Kg/0.75CUFT							
NOTE	1. All parameters NOT specially mentioned are measured at 110VDC input, rated load and 25°C of ambient temperature. 2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor. 3. Tolerance : includes set up tolerance, line regulation and load regulation. 4. The power supply is considered a component which will be installed into a final equipment. All the EMC tests are been executed by mounting the unit on a 360mm*360mm metal plate with 1mm of thickness. The final equipment must be re-confirmed that it still meets EMC directives. 5. Strongly recommended that external output capacitance should not exceed 5000uF. 6. The ambient temperature derating of 3.5°C/1000m with fanless models and of 5°C/1000m with fan models for operating altitude higher than 2000m(6500ft).								

■ Block Diagram



■ Input Reverse Polarity Protection

There is a MOSFET connected in series to the negative input line. If the input polarity is connected reversely, the MOSFET opens and there will be no output to protect the unit.

■ Input Range and Transient Ability

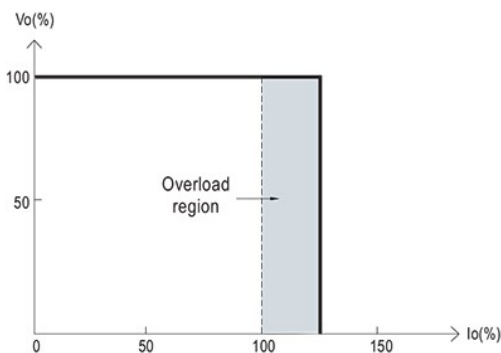
The series has a wide range input capability. With $\pm 40\%$ of rated input voltage, it can withstand that for 1 second.

■ Inrush Current

Inrush current is suppressed by a resistor during the initial start-up, and then the resistor is bypassed by a MOSFET to reduce power consumption after accomplishing the start-up.

■ Overload Protection

If the output draw up to 105~135% of its output power rating, the converter will go into overload protection which is constant current mode. After the faulty condition is removed, it will recover automatically. Please refer to the diagram below for the detail operation characteristic. Please note that it's not suitable to operate within the overload region continuously, or it may cause to over temperature and reduce the life of the power supply unit or even damage it.



■ Over Voltage Protection

The converter shuts off to protect itself when the output voltage drawn exceeds 115~140% of its output rating. It must be repowered on to recover.

■ LED Indicator

Equipped with a built-in LED indicator, the converter provides an easy way for users to check its condition through the LED indicator.

Green : normal operation; No signal: no power or failure.

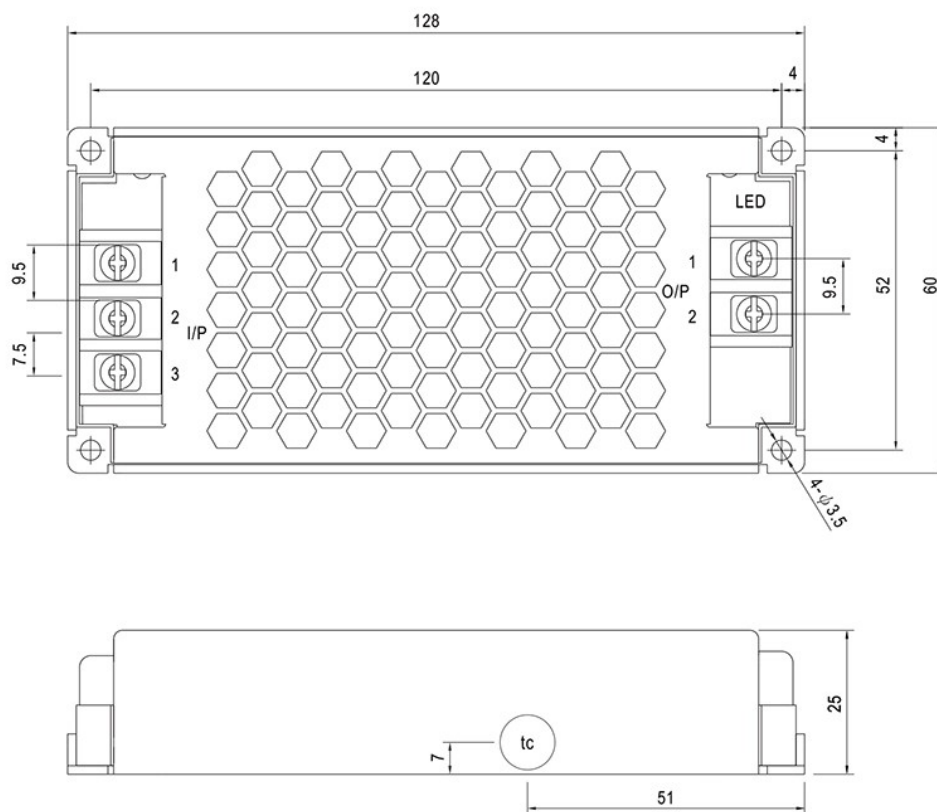
■ Derating Curve

Single unit operation

If the unit has no iron plate mounted on its bottom, the maximum ambient temperature for the unit will be 55°C as operating under full load condition. It requires de-rating output current when ambient temperature is between $55\sim 70^{\circ}\text{C}$

■ Mechanical Specification

Unit:mm



• (tc) : Max. Case Temperature

Input Terminal Pin No. Assignment :

Pin No.	Assignment
1	DC INPUT V+
2	DC INPUT V-
3	FG $\perp$

Output Terminal Pin No. Assignment :

Pin No.	Assignment
1	DC OUTPUT -V
2	DC OUTPUT +V