

NACA.600M-S5/SP2VA 电流传感器 Current Transducer

The NACA.600M-S5/SP2VA family is for the electronic measurement of DC, AC or pulsed currents in high power and low voltage automotive applications with galvanic separation between the primary circuit(high power) and the secondary circuit (electronic circuit).


Absolute rating(not operating)

Parameter	Symbol	Unit	Specification			Conditions
			Min	Typical	Max	
Maximum supply voltage	U _C	V	-0.1		6	Exceeding this voltage may temporary reconfigure the circuit until the next power-on
Max primary current peak	I _P	A	-600		600	Busbar temperature must be below 150°C
Ambient storage temperature	T _S	°C	-40		125	
Electrostatic discharge voltage	U _{ESD}	kV			8	ISO 10605
Maximum admissible vibration(random)		m•s ⁻²	96.6			
RMS voltage for AC insulation test, 50 Hz, 1 min	U _D	kV			2.5	ISO 16750-2
Isolation resistance	R _{IS}	MΩ	500			
Creepage distance	d _{CP}	mm	4.26			
Clearance	d _{CI}	mm	4.26			
Comparative tracking index	CTI	V	PLC3			
Maximum reverse Supply Voltage	V _{RCC}	V			-0.1	
Maximum reverse output Voltage	V _{ROUT}	V			-0.1	

Operating characteristics in nominal range(I_{PN})

Parameter	Symbol	Unit	Specification			Conditions
			Min	Typical	Max	
Primary current, measuring range	I _{PN}	A	-600		600	
Primary nominal DC or rms current	I _{PM}	A	-600		600	
Supply voltage ¹⁾	U _C	V	4.75	5	5.25	
Ambient operating temperature	T _A	°C	-40		125	
output voltage(Analog)	V _{out}	V	$V_{out} = (U_c/5) \cdot (V_0 + G \cdot I_p)$			@U _C
Sensitivity	G	mV/A		3.333		@U _C =5V
Offset voltage	V _O	V		2.5		
Current consumption	I _C	mA		13	15	@ U _C =5V, No load on V _{out}
Load resistance	R _L	KΩ	10			
Capacitive loading	C _L	nF		1	10	
Output internal resistance	R _{OUT}	Ω			10	DC
Performance Data¹⁾						
Ratiometricity error	ε _R	%		0.5		
Sensitivity error	ε _G	%	±1	±0.6	±1	
Electrical offset voltage	V _{OE}	mV		±3		
Magnetic offset voltage	V _{OM}	mV		±2		
Global accuracy @ 0A	X _G	%	-0.5		0.5	
Average temperature coefficient of V _{OE}	TCV _{OE}	mV/°C	-0.1	±0.04	0.1	
Average temperature coefficient of G	TCV _G	%/°C	-0.05	±0.02	0.05	
Linearity error	ε _L	%	-0.5		0.5	Of full range
Step response time to 90 % I _{PN}	t _r	μs		4	7	
Frequency bandwidth ²⁾	BW	kHz	40			@-3dB
Phase shift	ΔΦ	°	-4			@DC to 1kHz
Minimum output voltage	V _{SZ}	V			0.3	@U _C =5V

Maximum output voltage	V	4.7		@Uc=5V
Output voltage noise peak-peak	V _{no p-p}	mV		14
Output RMS voltage noise	V _{no}			2.2

Global Absolute Error(mV)

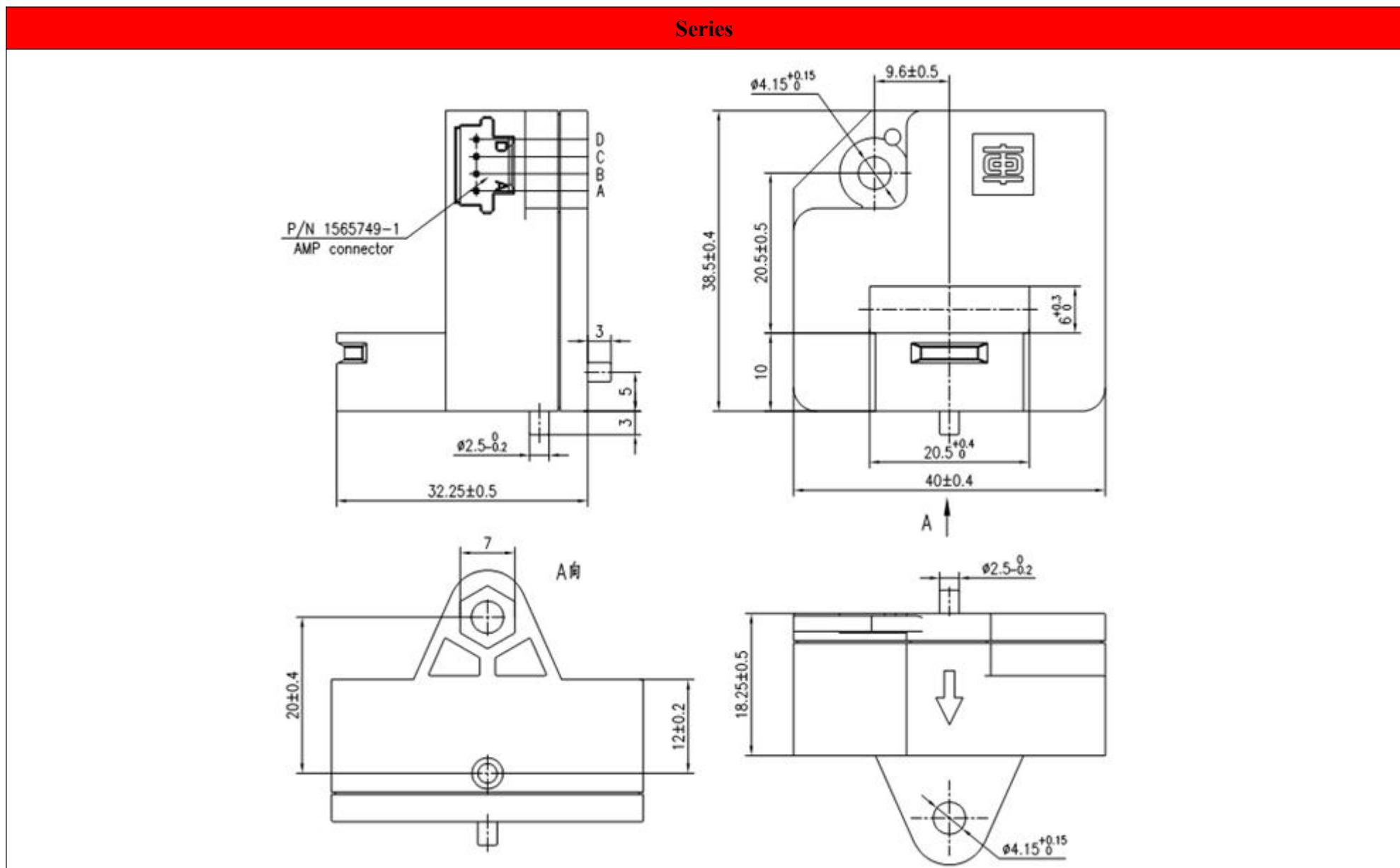
IP(A)	Accuracy @25°C (Uc=5V)			Accuracy @T°C range (Uc=5V)		
	20mV	6A	1%	65mV	19.50A	3.25%
-600	10mV	3A	0.5%	18mV	5.40A	0.9%
600	20mV	6A	1%	65mV	19.50A	3.25%

Notes:

1) The output voltage V_{OUT} is fully ratiometric. The offset and sensitivity are dependent on the supply voltage U_C relative to the following formula.

$$I_P = \left(\frac{5}{U_C} \times V_{OUT} - V_0 \right) \times \frac{1}{G}$$

2) @I_P =200A to avoid excessive heating of the busbar, the magnetic core and the ASIC.

Dimensions NACA.600M-S5/SP2VA series(in mm)


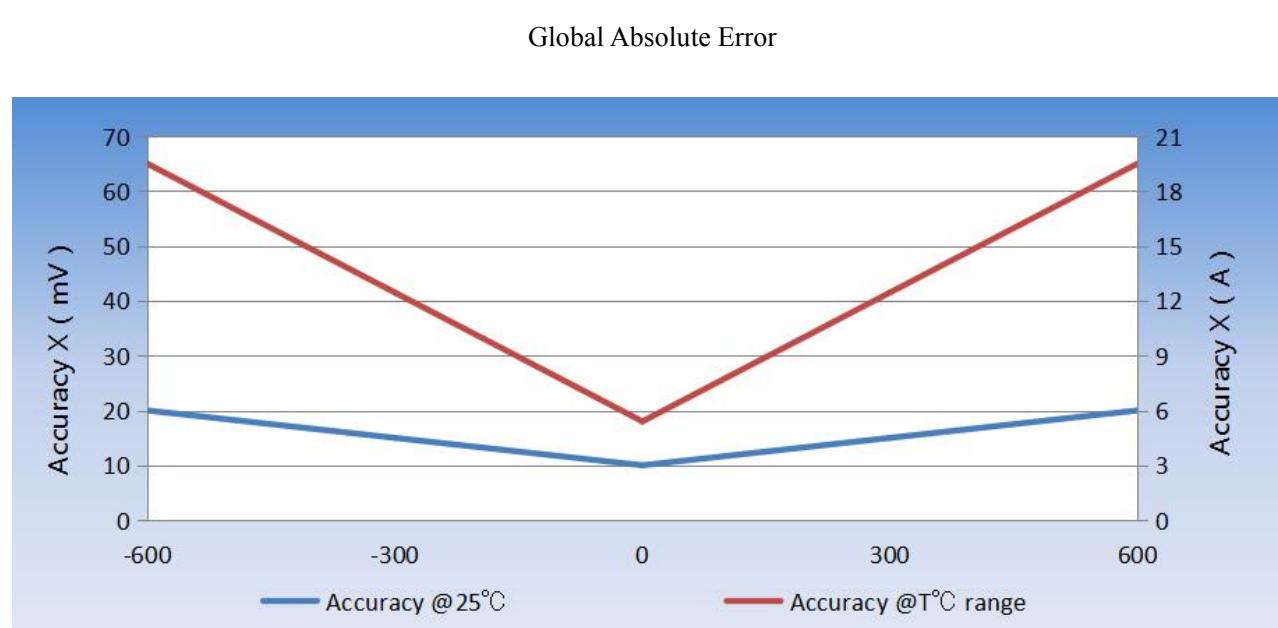
Mechanical characteristics	Remarks								
<ul style="list-style-type: none"> Plastic case PA 66 GF 25 Magnetic core FeSi wound core Mass 50g 	$I_P = \left(\frac{5}{U_C} \times V_{OUT} - V_0 \right) \times \frac{1}{G}$ <ul style="list-style-type: none"> V_{OUT}>V₀ when I_P flows in the positive direction (see arrow on drawing) 								
Electronic schematic									
	<table border="1"> <tr> <td>NACA.XXXM-S5/SP2VA</td> <td>A → V_{out}</td> </tr> <tr> <td></td> <td>B → 0V</td> </tr> <tr> <td>电流传感器</td> <td>C → +5V</td> </tr> <tr> <td></td> <td>D → NC</td> </tr> </table>	NACA.XXXM-S5/SP2VA	A → V _{out}		B → 0V	电流传感器	C → +5V		D → NC
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PERFORMANCES PARAMETERS DEFINITIONS
Definition of typical, minimum and maximum values

Combined with SPC principle, the initial key characteristic of CRRC product gives the typical value, minimum value and maximum value of characteristic parameter measurement. To enable customers to have a more comprehensive understanding of the product's restrictions and permitted security conditions, as follow:

1.Typical value: the typical value (Typical) generally takes the mean of the measurement sample of the product characteristic parameter in the design and verification stage as a definite target value; If there is no clear average value, the mean range of the measurement sample in the product design validation phase is taken, and the mean range is defined as 68.27% when combined with the normal distribution. The probability interval corresponding to the interval level between $-\sigma$ and $+\sigma$.

2.Minimum and maximum values: The range of feature elements measured is part of the statistical distribution (Unless otherwise specified, such as a full 100% inspection) .Therefore, in combination with the principle of statistical probability distribution and the upper / lower limits of the measured value ,CRRC defines the probability interval between the minimum(Min) and maximum(Max) values to be 99.73%, corresponding to the interval level between -3σ and $+3\sigma$.

NACA.600M-S5/SP2VA Chart data


IP(A)	Accuracy @25°C (Uc=5V)			Accuracy @T°C range (Uc=5V)		
-600	20mV	6A	1%	65mV	19.50A	3.25%
0	10mV	3A	0.5%	18mV	5.40A	0.9%
600	20mV	6A	1%	65mV	19.50A	3.25%

Accuracy error specified at ± 3 Sigma

Environmental test specifications

Name	Standard
CHARACTERIZATION @ 25°C(initial)	
Sensitivity / Accuracy / Overall accuracy	Q/CR 268-2014
Offset / Electrical Offset / Magnetic Offset	Q/CR 268-2014
Linearity error	Q/CR 268-2014
Current Consumption	/
CHARACTERIZATION WITH T°C(initial)	
Sensitivity / Accuracy / Overall accuracy	ISO 16750-4:2006
T °C variation of ... / Temperature Coefficient of G	ISO 16750-4:2006
Offset / Electrical Offset / Magnetic Offset	ISO 16750-4:2006
T °C variation of ... /Temperature Coefficient of Offset	ISO 16750-4:2006
Linearity error	ISO 16750-4:2006
ELECTRICAL TESTS @ 25 °C	
Response time di/dt	100 A/ μ s. I pulse = 600
Dielectric Withstand Voltage test	2500 V AC / 1 min / 50 Hz
Insulation Resistance test	500 V DC, time = 60 s, $R_{INS} \geq 500 M\Omega$ Minimum
ENVIRONMENTAL TESTS (CLIMATIC)	
Damp heat, cyclic	GB/T 18488.2-2015
MECHANICAL TESTS	
Vibration Random in T °C	ISO 16750-3:2007
Shocks	ISO 16750-3:2007
Vibration sinusoidal	QC/T 413-2002

EMC

Immunity to ElectroStatic Discharges (Handling of devices)	ISO 10605 (07/2008)
Immunity to Conducted disturbances (BCI)	ISO 11452-4 (12/2011)
Radiated electromagnetic immunity	ISO 11452-2:2004