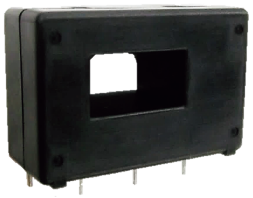
Fluxgate system / Voltage-output type, Through Type

F26PxxxS05 SERIES



RoHS

ABSOLUTE MAXIMUM RATINGS

Parameters	Symbol	Unit	Value	Comment
Supply voltage	Vcc	V	+7	
Primary conductor temperature	—	℃	105	
ESD (HBM: Human Body Model)	—	kV	4	C=150 pF, R=330 Ω

ISOLATION CHARACTERISTICS

Parameters	Symbol	Unit	Value	Comment
Insulation voltage	Vd	—	AC4300 V, for 1minute (Sensing current 0.5 mA)	Primary ⇔ Secondary
Impulse withstand voltage	Vw	kV	10	Primary ⇔ Secondary Input waveform : ・Front time 1.2 μs ・Time to half value 50 μs ・single
Insulation Resistance	R_{IS}	—	≧ 500M Ω (at DC500V)	Primary ⇔ Secondary
Clearance distance	d_{Cl}	mm	12.7 (MIN)	Primary ⇔ Secondary
Creepage distance	d_{Cp}	mm	12.7 (MIN)	Primary ⇔ Secondary
Case material	—	—	UL94 V-0	
Comparative Tracking Index ; (CTI)	CTI	V	600 (group Ⅰ)	
Application example	—	—	600V, CAT Ⅲ, PD2	Reinforced isolation, non uniform field according to EN62477-1:2012 and EN62477-1:2012/A11:2014.
	—	—	1000V, CAT Ⅲ, PD2	Basic isolation, non uniform field according to EN62477-1:2012 and EN62477-1:2012/A11:2014.

ENVIRONMENTAL AND MECHANICAL CHARACTERISTICS

Parameters	Symbol	Unit	Value			Comment
			MIN	TYP	MAX	
Ambient operating temperature	T_A	℃	− 40		+ 85	
Ambient storage temperature	T_S	℃	− 40		+ 85	
Mass	m	g		33		

SPECIFICATIONS

Ta=+25℃, R_L=10kΩ, Vcc=+5V

Parameters		Symbol	Unit	Value			Comment
				MIN	TYP	MAX	
Primary nominal current	F26P050S05	I_{PN}	A		50		
	F26P100S05				100		
	F26P150S05				150		
Primary current, measuring range (at Vcc= + 5V, Ta= + 85℃)	F26P050S05	I_{PM}	A	− 150		150	
	F26P100S05			− 270		270	
	F26P150S05			− 230		230	* 4
Number of secondary turns	F26P050S05	Ns	T		1258		
	F26P100S05				1258		
	F26P150S05				1588		
Supply Voltage		Vcc	V	4.75	5.00	5.25	
Consumption current (at IP=0 A)		Icc	mA		19		Icc=19+Ip/Ns+Vout/R_L
Reference voltage (output) (at IP=0 A)		Vref1	V	2.495	2.500	2.505	Ref OUT mode
Reference voltage (input)		Vref2	V	0		4	Ref IN mode
Output voltage (at Ip=0A)		Vout	V		Vref1,Vref2		
Electrical offset voltage * 1		Voe	mV	− 1.0		+1.0	Voe=Vout (at Ip=0 A)-Vref
Electrical offset current referred to primary	F26P050S05	Ioe	mA	− 80		+80	
	F26P100S05			− 160		+160	
	F26P150S05			− 240		− 240	
Temperature coefficient of Vref1		TCVref1	ppm/K			± 50	
Temperature coefficient of Output voltage (at Ip=0 A)		TCVo	ppm/K			± 10	ppm/K of 2.5 V (−40℃～+85℃)
Theoretical sensitivity	F26P050S05	Gth	mV/A		12.50		625 mV (at I_{PN}) Gth=|Vref-Vout|/I_{PN}
	F26P100S05				6.25		
	F26P150S05				4.17		
Sensitivity error * 2		ε_G	%	− 0.7		+0.7	
Temperature coefficient of Sensitivity (at Ta= − 40℃～+ 85℃)		TCG	ppm/K			± 40	
Sensitivity linearity error (at I_{PN}) * 2		ε_L	%	− 0.1		+0.1	
Peak to peak output ripple at oscillator frequency (f typ=450kHz)		—	mV		20		R_L=1 k Ω , at Ip=0 A
Reaction time (at 10% of I_{PN}) * 2		t_{ra}	μs		0.6		R_L=1 k Ω , di/dt=100 A/μs
Response time (at 70% of I_{PN}) * 2		t_r	μs		0.6		R_L=1 k Ω , di/dt=100 A/μs
Frequency bandwidth (± 3 dB) * 2 * 3		BW	kHz		100		R_L=1 k Ω
Overall accuracy * 2		X_G	%	− 0.96		+0.96	X_G=(100 × Voe/625)+ ε_G+ ε_L

*1 Offset voltage value is after removal of core hysteresis.
*2 Measurement condition : Primary conductor (bus bar) cross sectional area is as same as through hole, and penetration with 1turn in through hole.
Differences occur depending on the conditions of the primary conductor (busbar).
*3 High fundamental frequency primary current and/or harmonic current may result in excessive heating in magnetic core.
*4 The measurement range is less than F26P100S05.

STANDARDS

EN62477-1:2012 and EN62477-1:2012/A11:2014 , UL508 (File No.E243511)

※ Please refer to the another sheet about conditions of UL Recognition.

CHARACTERISTIC CURVE (TYP)

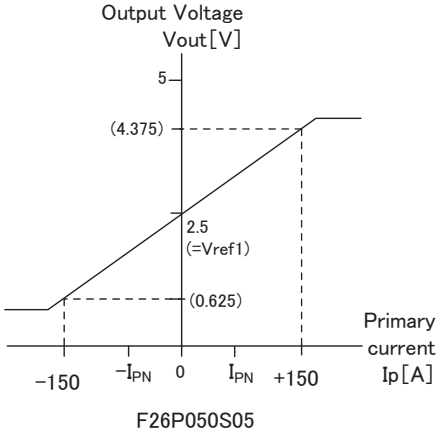


Figure 1 : Linearity curve (Internal reference voltage)

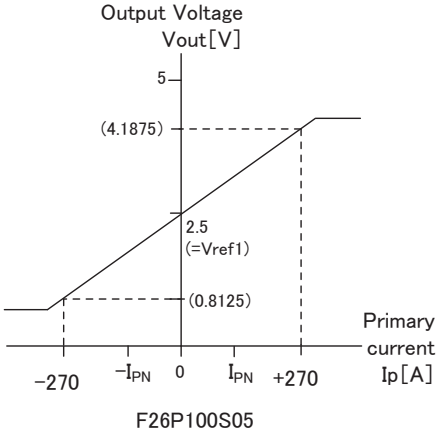


Figure 2 : Linearity curve (Internal reference voltage)

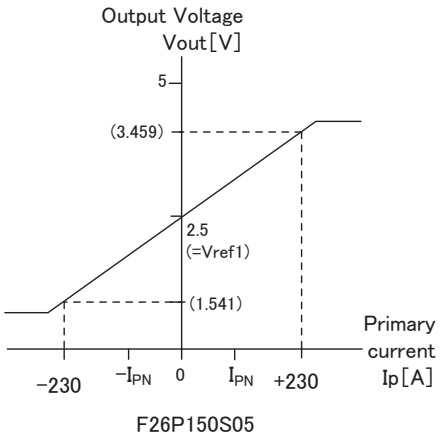


Figure 3 : Linearity curve (Internal reference voltage)

SUPPORT DOCUMENTATION

Maximum repetitive primary current

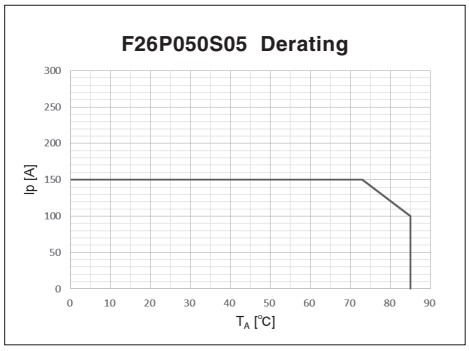


Figure 4 : Ip vs T_A for F26P050S05

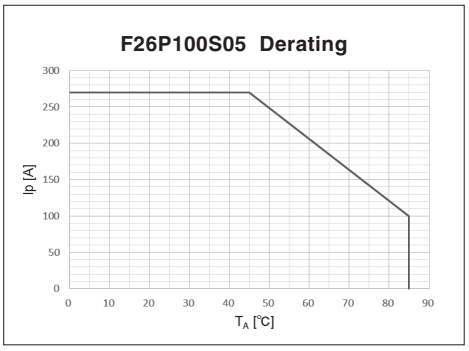


Figure 5 : Ip vs T_A for F26P100S05

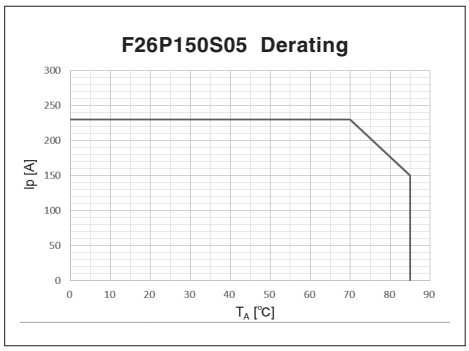


Figure 6 : Ip vs T_A for F26P150S05

According to which the following conditions are true the maximum repetitive primary current plot shows the boundary of the area.

① Ip < Ipm
② Junction temperature Tj < 125℃
③ Resistor power dissipation < 0.5 x rated power

SUPPORT DOCUMENTATION

Reference voltage

The Ref pin has two modes Ref IN and Ref OUT.

＜Ref OUT mode＞

The 2.5 V internal precision reference is used by the transducer as the reference point for bipolar measurements.

＜Ref IN mode＞

An external reference voltage is connected to the Ref pin. this voltage is specified in the range 0 to 4 V.
its voltage is used as the reference voltage at the time of measurement.

-either to source a typical current of (Vref2-2.5)/680,the maximum value will be 2.2 mA typ.when Vref2 = 4 V.
-or to sink a typical current of (2.5-Vref2)/680,the maximum value will be 3.68 mA typ.when Vref2 = 0 V.

The following graphs show how the measuring range of each transducer version depends on external reference voltage value Vref2.

R_L=1 kΩ , Vcc=+5 V, T_A=-40 ~ +85 ℃

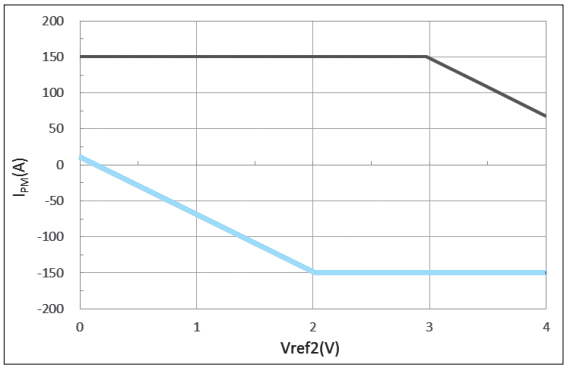


Figure 7 : I_{PM} vs Vref2 for F26P050S05

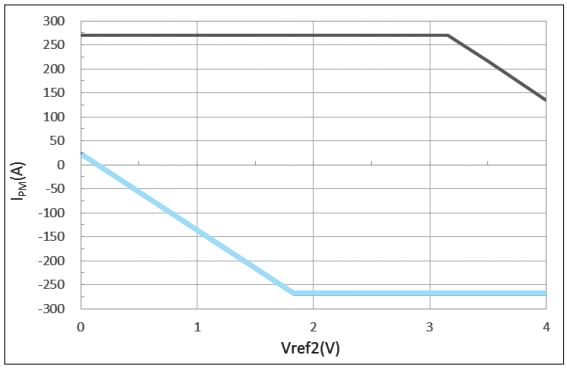


Figure 8 : I_{PM} vs Vref2 for F26P100S05

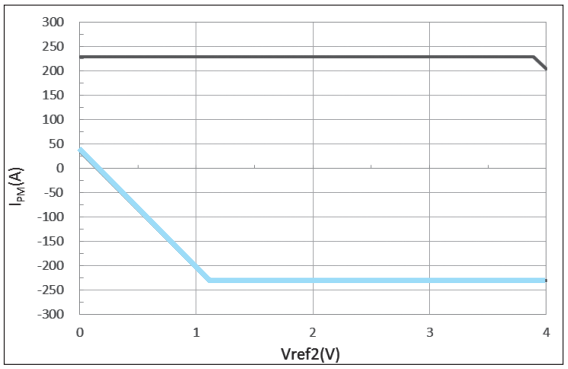


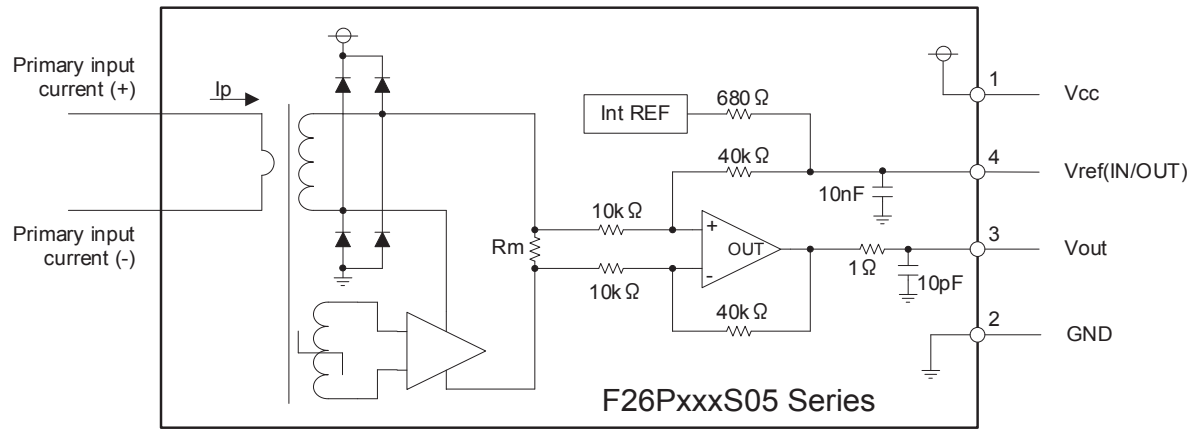
Figure 9 : I_{PM} vs Vref2 for F26P150S05

e. g. ; In case of F26P100S05

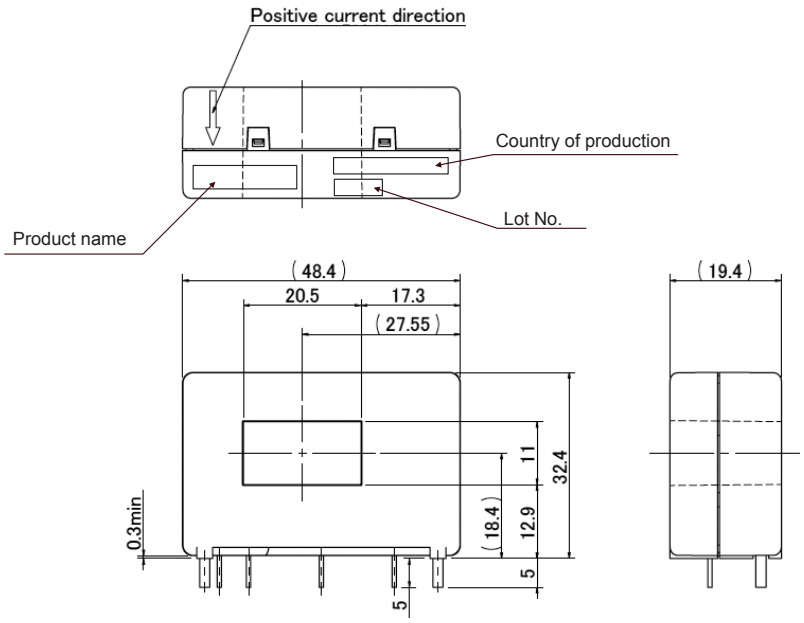
Upper limit :	Ip = +270 A	(Vref2=0 V ~ 3.16 V)
	Ip = +270-(Vref2-3.16 V)/0.00625	(Vref2=3.16 V ~ 4 V)
Lower limit :	Ip = − 270 A	(Vref2=1.84 V ~ 4 V)
	Ip = − 270-(Vref2-1.84 V)/0.00625	(Vref2=0 V ~ 1.84 V)

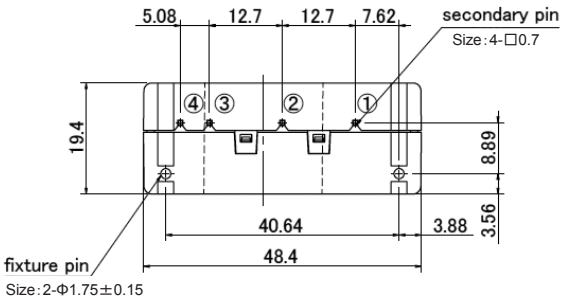
If you do not want to use the Ref pin, please unconnected.

CONNECTION



DIMENSIONS (mm)



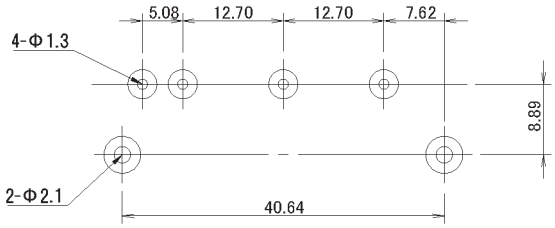


Terminal No.

① Vcc (+5V)
② GND
③ Vout
④ Vref (IN/OUT)

※ Tolerance: ± 0.5
Unit: mm

RECOMMENDED HOLE DIAMETER (mm)



TYPE DESIGNATION

F26 P xxx S 05 __
① ② ③ ④ ⑤ ⑥

① Model (3 figures)
F26 : Series
② Mounting configuration (1 figure)
P : PCB Mounting type
③ Measurement current range (3 figures)
050 : 50A
100 : 100A
150 : 150A
④ Control power supply type (1 figure)
S : Single supply
⑤ Power supply voltage (2 digits)
05 : 5V
⑥ Special specification
(none) : Standard type.
A : Output voltage waveform distortion improvement type.

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Tamura:

F26P150S05 F26P100S05 F26P050S05