

September 2016

# **Choke Coils for PFC**

Pin terminal type

PFC series

PFC3514QM PFC3318QM PFC3519QM PFC3819QM PFC4124QM PFC2723ER PFC3125ER PFC3525ER PFC3820QN PFC3831QN

## An attention matter on use

Please read this specifications before using this product by all means.

## An attention matter on security

I undertake use with this product, and it is paid attention enough, and please design an attention matter safely.

## ▲ Attention on a design

○ When you designs a base of an electric circuit.

Please use size of the hole or pad which we recommend.

O Magnetic flux to leak out occurs. Please confirm it about influence of magnetic flux beforehand.

There is fear to cause false movement of machinery.

 $\bigcirc$  In a design of a base of an electric circuit, Please consider the next contents.

In an applied safe standard.

The trans and distance with other parts

The product is not quakeproof structure. Accordingly please do not add vibration and a shock to it. There is fear to lose a function.

## Attention on the handling

Please do not use it when you let a product drop. The product produces possibility to lose a function

O Please pay attention to the pin which had it pointed keenly.

There is danger to injure.

- Please avoid the next place. The place that receives a drop of water, trash, the dust, foggy influence. The place where direct rays of the sun hits. There is fear to cause false movement of machinery.
- Please prohibit safekeeping and use at the next place. Environment to be accompanied with gas corrosion, salt, acid, alkali. There is fear to lose a function.

When you carry the product on a base of an electric circuit.
 Please do not use a metal tool. Because impossible power is added to a product.
 There is fear to lose a function.

## Attention

O I considered the next matter, and we designed a product.

Safe standard and power supply voltage and circuit drive condition, drive frequency and Duty ON-TIME.

By those conditions, we decided structure and the turns number.

Please avoid use in designed condition outside.

There are destruction of a circuit part and fear of ignition.

○ This product considered a characteristic of a component and a self temperature rise, and it was made.

We select range of humidity as use temperature already.

Please avoid use by range more than this.

There are the damage and fear of ignition.

Please avoid use in the environment next.

The environment that trash and the dust stick to a product. There is fear to cause a fire.

The products listed on this specification sheet are intended for use in general electronic equipment (AV equipment, telecommunications equipment, home appliances, amusement equipment, computer equipment, personal equipment, office equipment, measurement equipment, industrial robots) under a normal operation and use condition.

The products are not designed or warranted to meet the requirements of the applications listed below, whose performance and/or quality require a more stringent level of safety or reliability, or whose failure, malfunction or trouble could cause serious damage to society, person or property.

If you intend to use the products in the applications listed below or if you have special requirements exceeding the range or conditions set forth in this catalog, please contact us.

(1) Aerospace/Aviation equipment

(2)Transportation equipment (cars, electric trains, ships, etc.)

(3) Medical equipment

- (4) Power-generation control equipment
- (5) Atomic energy-related equipment
- (6) Seabed equipmentapplications
- (7) Transportation control equipment

- (8) Public information-processing equipment
- (9) Military equipment
- (10) Electric heating apparatus, burning equipment
- (11) Disaster prevention/crime prevention equipment
- (12) Safety equipment
- (13) Other applications that are not considered general-purpose applications

When designing your equipment even for general-purpose applications, you are kindly requested to take into consideration securing protection circuit/device or providing backup circuits in your equipment.

**⊘TDK** 

# **Choke Coils for PFC**

# **PFC** series

# Contents

# Page

Development Concept	4
Overview	5
PFC3514QM (Height from the board : 15.5mm)	6
PFC3318QM (Height from the board : 20mm)	8
PFC3519QM (Height from the board : 20mm)	10
PFC3819QM (Height from the board : 20mm)	12
PFC4124QM (Height from the board : 25mm)	14
PFC2723ER (Height from the board : 25mm)	16
PFC3125ER (Height from the board : 27mm)	18
PFC3525ER (Height from the board : 27mm)	20
PFC3820QN (Height from the board: 50mm Narrow floor space)	22
PFC3831QN (Height from the board: 50mm Narrow floor space)	24
Specification Request Form	26

(4/26)

# **Choke Coils for PFC**

Pin terminal type

# **Development Concept of the PFC series**

This is a power - factor improvement circuit for choke coils for smaller, thinner and narrow floor space in recent years electronic equipment.

## MATERIAL

Thanks to the development of an optimized core shape and materials, the choke coil has DC superimposition characteristics suitable for the design of various types of electronic devices.

Optimized materials have been selected, and at the same time the original core shape for PFC has been developed.

The product line-up has been expanded to cater for various types of electronic devices that need to become smaller, thinner and narrow floor space.

## MANUFACTURING METHOD

Since the PFC Series supports automatic winding, the product is of a high quality and can be manufactured stably.

It is designed to support automatic winding, which enables a remarkable reduction in the loss generated to achieve a proficient in manual winding until stable production.

In addition, the characteristic variations of the winding wire and creepage tape have largely been removed, stabilizing the transformer's characteristics.

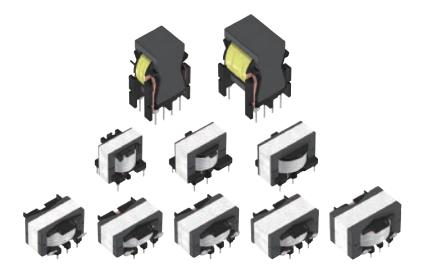
## OPTIMIZATION DESIGN

While the existing line-up of standard products remains available, new products can also be manufactured to meet customers' requests. Using design tools developed with TDK's comprehensive know-how, high-precision design has been achieved in a short period of time.

- 1) For optimization design and high-quality stable production, customers can use a specification request form.
- If you provide the necessary information in the form, you will receive the optimization design in a short time.
- 2) TDK recommends design with a standard core gap (AL-value) for optimization and shorter trial and mass production lead time.

## ENVIRONMENT

The PFC series is RoHS directive-compliant product.



Pin terminal type

# **Overview of the PFC series**

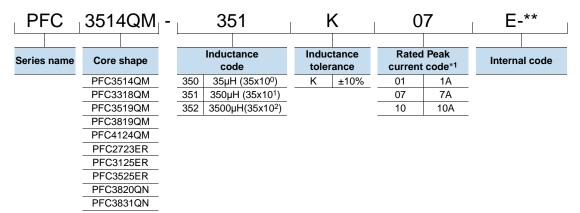
## FEATURES

A low height(15.5 to 27mm in height) and narrow floor space(QN type) are achieved.
 Large current is achieved in a small shape.

## APPLICATION

AV equipment, digital consumer electronics

## PART NUMBER CONSTRUCTION



\*1 The rounded-off value.

## OPERATING TEMPERATURE RANGE, PACKAGE QUANTITY, PRODUCT WEIGHT

	Temperat	ure range		
Туре	Operating temperature <sup>*2</sup>	Storage temperature <sup>*3</sup>	Package quantity	Individual weight*4
	(°C)	(°C)	(pieces/box)	(g)
PFC3514QM	-30 to +120	-40 to +80	175	40.0
PFC3318QM	-30 to +120	-40 to +80	140	27.6
PFC3519QM	-30 to +120	-40 to +80	140	50.3
PFC3819QM	-30 to +120	-40 to +80	100	60.5
PFC4124QM	-30 to +120	-40 to +80	90	91.9
PFC2723ER	-30 to +120	-40 to +80	150	34.1
PFC3125ER	-30 to +120	-40 to +80	120	49.7
PFC3525ER	-30 to +120	-40 to +80	120	57.3
PFC3820QN	-30 to +120	-40 to +80	105	71.9
PFC3831QN	-30 to +120	-40 to +80	63	115.3

\*2 Operating temperature range includes self-temperature rise.

\*3 The Storage temperature range is for after the circuit board is mounted.

\*4 Typical weight.

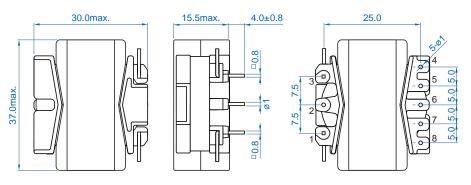
OROHS Directive Compliant Product: See the following for more details.https://product.tdk.com/info/en/environment/rohs/index.html

**⇔TDK** 

A Please be sure to request delivery specifications that provide further details on the features and specifications of the products for proper and safe use. Please note that the contents may change without any prior notice due to reasons such as upgrading.

# PFC QM series PFC3514QM Type

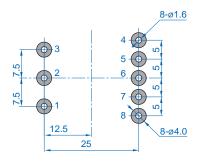
## SHAPE & DIMENSIONS





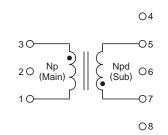
Dimensions in mm

RECOMMENDED LAND PATTERN



Dimensions in mm

## **CIRCUIT DIAGRAM**



A Please be sure to request delivery specifications that provide further details on the features and specifications of the products for proper and safe use. Please note that the contents may change without any prior notice due to reasons such as upgrading.

**公TDK** 

# PFC QM series PFC3514QM Type

## ELECTRICAL CHARACTERISTICS

### **CHARACTERISTICS SPECIFICATION TABLE**

Part number	Mount method	Frequency (kHz) min.	PFC output power (W)	Inductance (µH)	Rated peek current <sup>*1</sup> (A)	Turn ratio (Np/Npd)
PFC3514QM-351K04B-00	Through hole	65	100	350	3.7	10.0
PFC3514QM-281K05B-00	Through hole	65	125	280	4.6	9.8
PFC3514QM-231K06B-00	Through hole	65	150	230	5.5	9.6

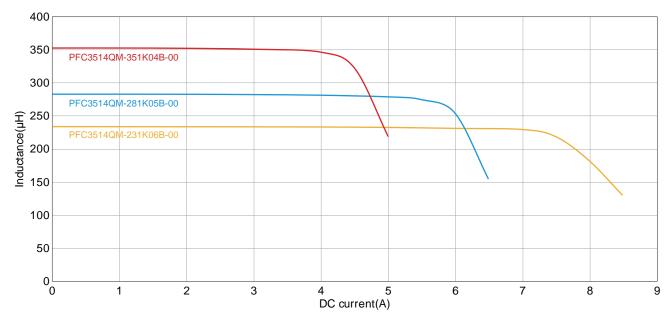
#### O Measurement equipment\*2

Measurement item	Product No.	Manufacturer
Inductance	4284A	Keysight Technologies
DC bias characteristics	4284A + 42841A	Keysight Technologies

\*1 The rated peak current is determined by the triangular waveform current when the temperature increase is less than 40°C during continuous operation.

 $^{\ast 2}$  Equivalent measurement equipment may be used.

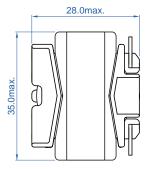
### □ INDUCTANCE CHANGE VS. DC BIAS CHARACTERISTICS GRAPH

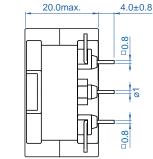


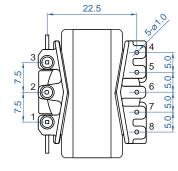
# TRANSFORMERS

# PFC QM series PFC3318QM Type

## SHAPE & DIMENSIONS



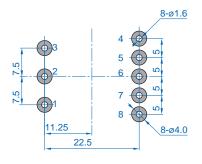






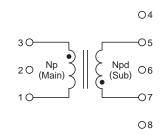
Dimensions in mm

RECOMMENDED LAND PATTERN



Dimensions in mm

## **CIRCUIT DIAGRAM**



(9/26)

# PFC QM series **PFC3318QM Type**

## ELECTRICAL CHARACTERISTICS

### **CHARACTERISTICS SPECIFICATION TABLE**

Part number	Mount method	Frequency (kHz) min.	PFC output power (W)	Inductance (µH)	Rated peek current <sup>*1</sup> (A)	Turn ratio (Np/Npd)
PFC3318QM-601K03B-00	Through hole	50	75	600	2.8	9.0
PFC3318QM-601K03E-00	Through hole	50	75	600	2.8	9.6
PFC3318QM-451K04B-00	Through hole	50	100	450	3.7	9.0

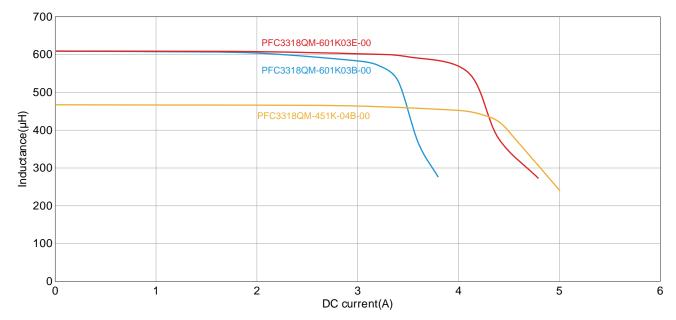
#### O Measurement equipment\*2

Measurement item	Product No.	Manufacturer
Inductance	4284A	Keysight Technologies
DC bias characteristics	4284A + 42841A	Keysight Technologies

\*<sup>1</sup> The rated peak current is determined by the triangular waveform current when the temperature increase is less than 40°C during continuous operation.

\*2 Equivalent measurement equipment may be used.

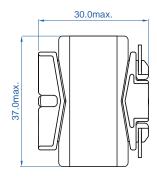
## □ INDUCTANCE CHANGE VS. DC BIAS CHARACTERISTICS GRAPH

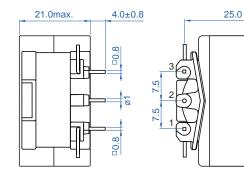


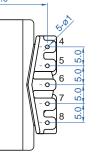
# TRANSFORMERS

# PFC QM series PFC3519QM Type

## SHAPE & DIMENSIONS



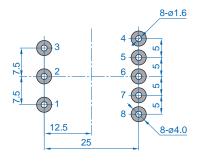






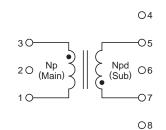
Dimensions in mm

RECOMMENDED LAND PATTERN



Dimensions in mm

## **CIRCUIT DIAGRAM**



# PFC QM series **PFC3519QM Type**

## ELECTRICAL CHARACTERISTICS

### **CHARACTERISTICS SPECIFICATION TABLE**

Part number	Mount method	Frequency (kHz) min.	PFC output power (W)	Inductance (µH)	Rated peek current <sup>*1</sup> (A)	Turn ratio (Np/Npd)
PFC3519QM-451K04E-00	Through hole	50	100	450	3.7	10
PFC3519QM-301K06B-50	Through hole	50	150	300	5.5	9.8
PFC3519QM-231K07B-50	Through hole	50	200	230	7.4	9.6

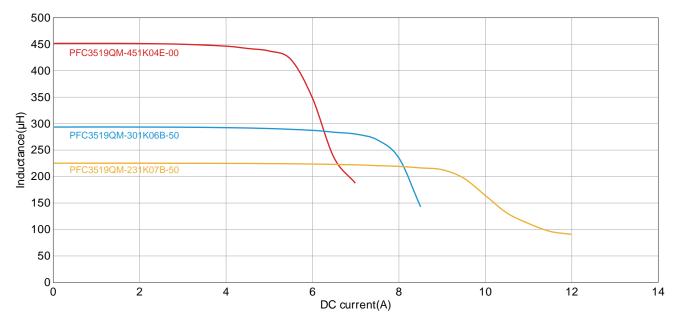
#### O Measurement equipment\*2

Measurement item	Product No.	Manufacturer
Inductance	4284A	Keysight Technologies
DC bias characteristics	4284A + 42841A	Kevsight Technologies

\*1 The rated peak current is determined by the triangular waveform current when the temperature increase is less than 40°C during continuous operation.

 $^{\ast 2}$  Equivalent measurement equipment may be used.

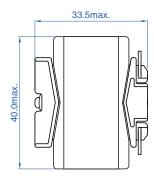
### □ INDUCTANCE CHANGE VS. DC BIAS CHARACTERISTICS GRAPH

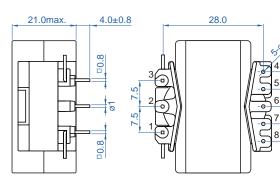


# TRANSFORMERS

# PFC QM series PFC3819QM Type

## SHAPE & DIMENSIONS

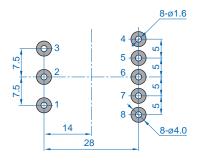






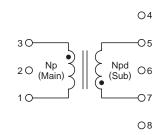
Dimensions in mm

RECOMMENDED LAND PATTERN



Dimensions in mm

## CIRCUIT DIAGRAM



# PFC QM series **PFC3819QM Type**

## ELECTRICAL CHARACTERISTICS

### **CHARACTERISTICS SPECIFICATION TABLE**

Part number	Mount method	Frequency (kHz) min.	PFC output power (W)	Inductance (µH)	Rated peek current <sup>∗1</sup> (A)	Turn ratio (Np/Npd)
PFC3819QM-301K06E-50	Through hole	50	150	300	5.5	9.8
PFC3819QM-231K07D-50	Through hole	50	200	230	7.4	9.6
PFC3819QM-181K09B-50	Through hole	50	250	180	8.8	9.5
PFC3819QM-151K11B-00	Through hole	50	300	150	11.1	9.8

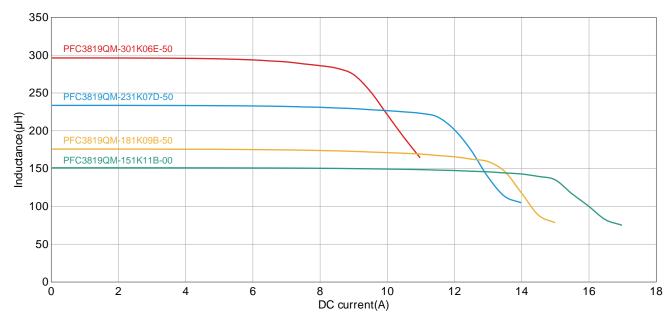
#### ○ Measurement equipment\*<sup>2</sup>

Measurement item	Product No.	Manufacturer
Inductance	4284A	Keysight Technologies
DC bias characteristics	4284A + 42841A	Keysight Technologies

\*1 The rated peak current is determined by the triangular waveform current when the temperature increase is less than 40°C during continuous operation.

\*2 Equivalent measurement equipment may be used.

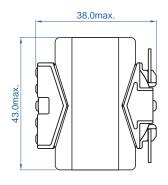
## □ INDUCTANCE CHANGE VS. DC BIAS CHARACTERISTICS GRAPH

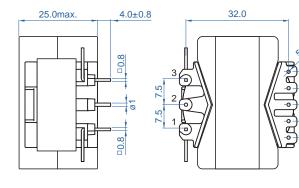


# TRANSFORMERS

# PFC QM series PFC4124QM Type

## SHAPE & DIMENSIONS

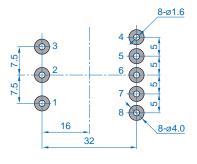






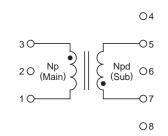
Dimensions in mm

RECOMMENDED LAND PATTERN



Dimensions in mm

## **CIRCUIT DIAGRAM**



# PFC QM series **PFC4124QM Type**

## ELECTRICAL CHARACTERISTICS

### **CHARACTERISTICS SPECIFICATION TABLE**

Part number	Mount method	Frequency (kHz) min.	PFC output power (W)	Inductance (µH)	Rated peek current <sup>*1</sup> (A)	Turn ratio (Np/Npd)
PFC4124QM-181K09D-00	Through hole	50	250	180	8.8	9.5
PFC4124QM-151K11D-00	Through hole	50	300	150	11.1	9.8

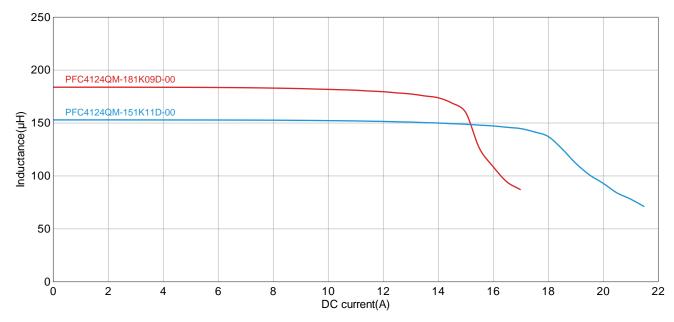
#### O Measurement equipment\*2

Measurement item	Product No.	Manufacturer
Inductance	4284A	Keysight Technologies
DC bias characteristics	4284A + 42841A	Keysight Technologies

\*1 The rated peak current is determined by the triangular waveform current when the temperature increase is less than 40°C during continuous operation.

\*2 Equivalent measurement equipment may be used.

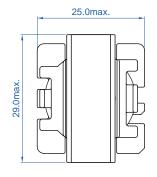
## □ INDUCTANCE CHANGE VS. DC BIAS CHARACTERISTICS GRAPH

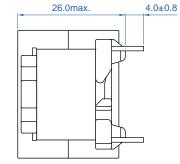


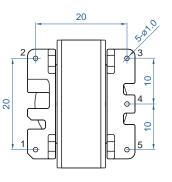
# TRANSFORMERS

# PFC ER series PFC2723ER Type

## SHAPE & DIMENSIONS



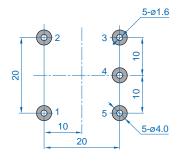






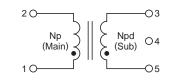
Dimensions in mm

RECOMMENDED LAND PATTERN



Dimensions in mm

## CIRCUIT DIAGRAM



# PFC ER series **PFC2723ER Type**

## ELECTRICAL CHARACTERISTICS

## **CHARACTERISTICS SPECIFICATION TABLE**

Part number	Mount method	Frequency (kHz) min.	PFC output power (W)	Inductance (µH)	Rated peek current <sup>*1</sup> (A)	Turn ratio (Np/Npd)
PFC2723ER-601K02B-00	Through hole	50	75	600	2.4	9.8
PFC2723ER-421K03B-50	Through hole	50	100	420	3.4	10.8

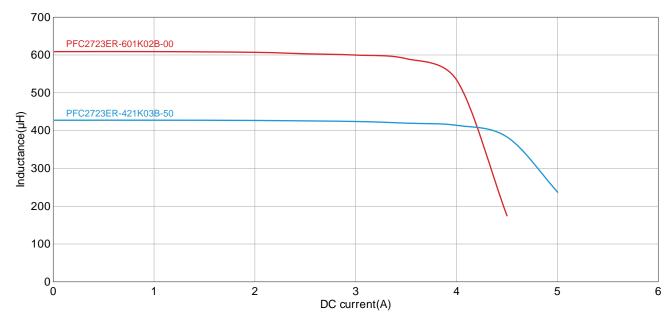
#### O Measurement equipment\*2

Measurement item	Product No.	Manufacturer
Inductance	4284A	Keysight Technologies
DC bias characteristics	4284A + 42841A	Keysight Technologies

\*1 The rated peak current is determined by the triangular waveform current when the temperature increase is less than 40°C during continuous operation.

\*2 Equivalent measurement equipment may be used.

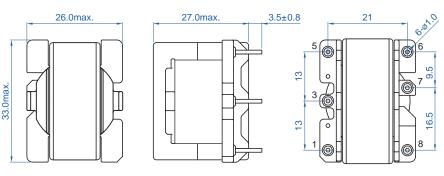
#### □ INDUCTANCE CHANGE VS. DC BIAS CHARACTERISTICS GRAPH



## TRANSFORMERS

# PFC ER series PFC3125ER Type

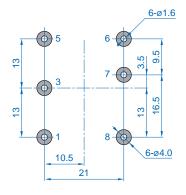
## SHAPE & DIMENSIONS





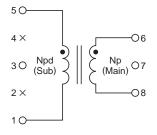
Dimensions in mm

RECOMMENDED LAND PATTERN



Dimensions in mm

## CIRCUIT DIAGRAM



# PFC ER series **PFC3125ER Type**

## ELECTRICAL CHARACTERISTICS

### **CHARACTERISTICS SPECIFICATION TABLE**

Part number	Mount method	Frequency (kHz) min.	PFC output power (W)	Inductance (µH)	Rated peek current <sup>*1</sup> (A)	Turn ratio (Np/Npd)
PFC3125ER-451K03E-00	Through hole	50	100	450	2.7	10.0
PFC3125ER-301K05B-00	Through hole	50	150	300	4.9	10.4
PFC3125ER-231K06B-00	Through hole	50	200	230	6.4	9.0

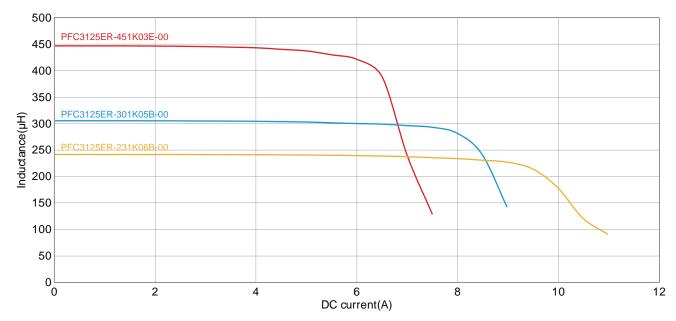
#### O Measurement equipment\*2

Measurement item	Product No.	Manufacturer
Inductance	4284A	Keysight Technologies
DC bias characteristics	4284A + 42841A	Keysight Technologies

\*1 The rated peak current is determined by the triangular waveform current when the temperature increase is less than 40°C during continuous operation.

 $^{\ast 2}$  Equivalent measurement equipment may be used.

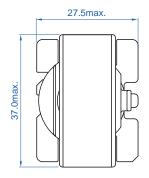
### □ INDUCTANCE CHANGE VS. DC BIAS CHARACTERISTICS GRAPH

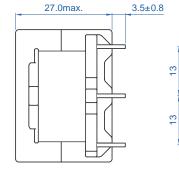


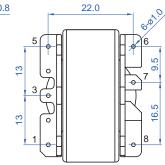
# TRANSFORMERS

# PFC ER series PFC3525ER Type

## SHAPE & DIMENSIONS



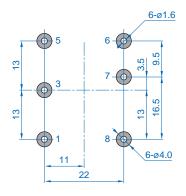






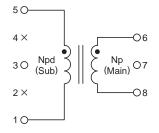
Dimensions in mm

RECOMMENDED LAND PATTERN



Dimensions in mm

## **CIRCUIT DIAGRAM**



# PFC ER series **PFC3525ER Type**

## ELECTRICAL CHARACTERISTICS

### **CHARACTERISTICS SPECIFICATION TABLE**

Part number	Mount method	Frequency (kHz) min.	PFC output power (W)	Inductance (µH)	Rated peek current <sup>*1</sup> (A)	Turn ratio (Np/Npd)
PFC3525ER-301K04E-00	Through hole	50	150	300	4.1	10.4
PFC3525ER-231K06E-00	Through hole	50	200	225	5.6	10.0
PFC3525ER-181K09B-00	Through hole	50	250	180	9.5	10.5

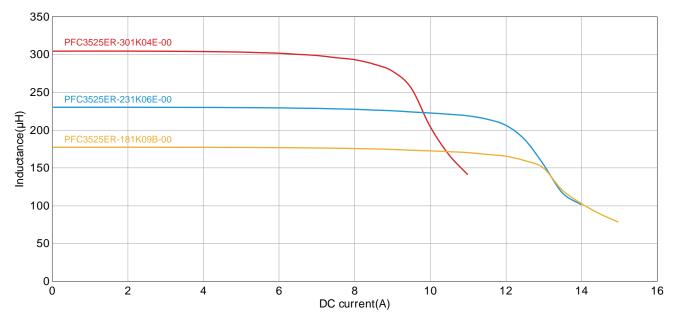
#### O Measurement equipment\*2

Measurement item	Product No.	Manufacturer
Inductance	4284A	Keysight Technologies
DC bias characteristics	4284A + 42841A	Keysight Technologies

\*1 The rated peak current is determined by the triangular waveform current when the temperature increase is less than 40°C during continuous operation.

 $^{\ast 2}$  Equivalent measurement equipment may be used.

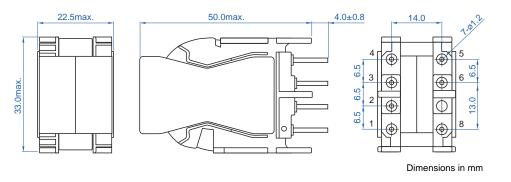
### □ INDUCTANCE CHANGE VS. DC BIAS CHARACTERISTICS GRAPH



## TRANSFORMERS

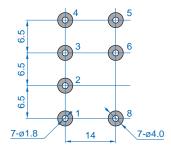
# PFC QN series PFC3820QN Type

## SHAPE & DIMENSIONS



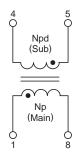


RECOMMENDED LAND PATTERN



Dimensions in mm

## CIRCUIT DIAGRAM



# PFC QN series **PFC3820QN Type**

## ELECTRICAL CHARACTERISTICS

#### **CHARACTERISTICS SPECIFICATION TABLE**

Part number	Mount method	Frequency (kHz) min.	PFC output power <sup>*1</sup> (W)	Inductance (µH)	Rated peek current <sup>*2</sup> (A)	Turn ratio (Np/Npd)
PFC3820QN-900K11B-00	Through hole	35	800	90	11	7

#### O Measurement equipment\*3

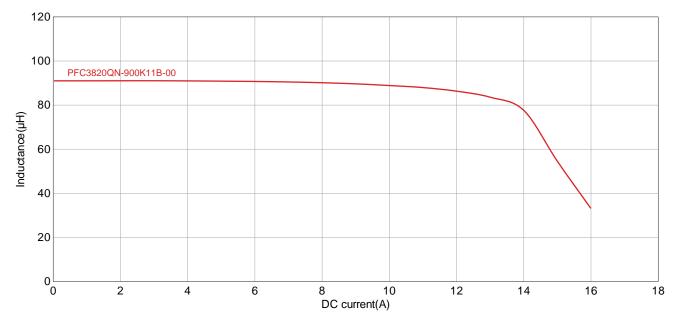
Measurement item	Product No.	Manufacturer
Inductance	4284A	Keysight Technologies
DC bias characteristics	4284A + 42841A	Keysight Technologies
10		

\*1 Output power at 220 Vac input.

\*2 The rated peak current is determined by the triangular waveform current when the temperature increase is less than 40°C during continuous operation.

\*3 Equivalent measurement equipment may be used.

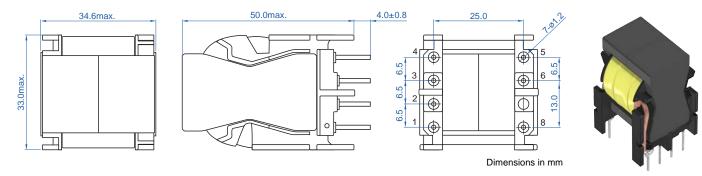
### □ INDUCTANCE CHANGE VS. DC BIAS CHARACTERISTICS GRAPH



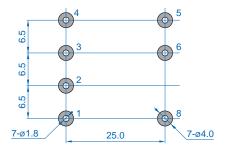
# TRANSFORMERS

# PFC QN series PFC3831QN Type

## SHAPE & DIMENSIONS



RECOMMENDED LAND PATTERN



Dimensions in mm

## CIRCUIT DIAGRAM



# PFC QN series **PFC3831QN Type**

## ELECTRICAL CHARACTERISTICS

#### **CHARACTERISTICS SPECIFICATION TABLE**

Part number	Mount method	Frequency (kHz) min.	PFC output power <sup>*1</sup> (W)	Inductance (µH)	Rated peek current <sup>*2</sup> (A)	Turn ratio (Np/Npd)
PFC3831QN-351K08B-00	Through hole	50	900	350	8	_

#### O Measurement equipment\*3

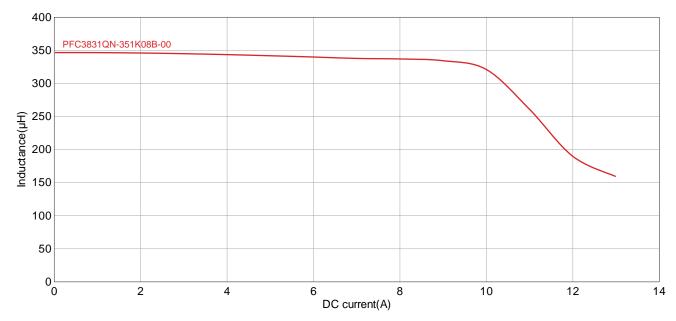
Measurement item	Product No.	Manufacturer
Inductance	4284A	Keysight Technologies
DC bias characteristics	4284A + 42841A	Keysight Technologies

\*1 Output power at 220 Vac input.

\*2 The rated peak current is determined by the triangular waveform current when the temperature increase is less than 40°C during continuous operation.

\*3 Equivalent measurement equipment may be used.

### □ INDUCTANCE CHANGE VS. DC BIAS CHARACTERISTICS GRAPH



Choke Coils for PFC	Specification	<b>Request Form</b>
---------------------	---------------	---------------------

lesued on

1.	Company name						
	Address						
	Department, applicant's nam						
	Name:						
	TEL/FAX :						
	E-mail :						
3.	Circuit system						
	Continuous mode Critica	al mode Interleave	Other (	)			
4.	Input specifications						
	AC input voltage: Rated	(V) ~	(V)	Ope	rating range:	(V) ~	(V)
	Frequency				nput voltage:		
5.	Design condition						
	(1) Clock frequency			Continuous mode(fixe	d frequency) :		(kHz)
				Critical mode(lowes			
	(2) Output voltage			, , , , , , , , , , , , , , , , , , ,			(Vdc)
	(3) Rated output power/Maxim	um peak power				(W) /	(W)
	(4) Minimum operating input vo				(Vac)		
	(5) Overcurrent point condition			(%)			
	(6) Maximum temperature rise	operating input voltage	- )			ΔΤ	(°C)
	Condition in tempe	rature evaluation (ex.: m	ninimum input,	rated load)			
	(7) Auxiliary winding				Yes	No	
	Number of windings						(Windings)
	Desired voltage value and c	urrent				(V) /	(mA)
	Necessity of insulation				Functional	insulation Re	einforced insulatior
	(8) Circuit diagram (If you desir	re any pin number, attac	ch a circuit diag	jram.)	Yes	No	
6.	Inductance value and saturat						
	Inductance value		μ	(H) Saturated cu	rrent value		(A)
7.	Desired core size and externa	al size					
	Core size:		External size l	.: W:	H(Height from	m the board):	mm max.
8.	IC expected to be used						
	Manufacturer name:			Product No.:			
9.	Production quantity informat	ion					
	Final set name:			Desired price/C	urrency:		
	Acceptance conditions of the a	bove price (FCA CHN,	CIP LA, DDP F	Paris etc.):			
	Production volume:	k/M Product	tion start perio	d:	Production pl	ace:	
	Prototyping time: (ES1)	(ES2)		(PP1)	(PP2)	(MP1)	
10.	Sample information						
	Required sample quantity:		pcs.	Requested delivery	time:		
11.	Note company regulations, s	uch as safe distance a	and dielectric	voltage strength, if th	ere are any.		
12.	If there are any other request	s (priorities in the com	npany, size or	price, etc.) or alterab	le items, please prov	ide a description.	
	son in Charge from Sales Promotion D		Recorded Date		—		
	son in Charge from Sales Dep.:		Recorded Date		—		
Pro	totype No:		Recorded Date				

TDK Corporation Magnetics Business Group, Business Promotions Dept. 3-9-1, Shibaura, Minato-ku Tokyo 108-0023, Japan TEL: 81-3-6852-7229, FAX: 81-3-6852-7159

# **X-ON Electronics**

Largest Supplier of Electrical and Electronic Components

Click to view similar products for Common Mode Chokes / Filters category:

Click to view products by TDK manufacturer:

Other Similar products are found below :

 RGCMF1210900H3T
 B82722A2102N001
 UAL21V07012500
 UAL24VR06500CH
 UALSC0220G0000
 UALSC058000000

 UALSC0580J0000
 UALSC1520JH000
 UALSU10VR15019
 UALSU10VR20010
 UALSU16VD30030
 UALSU16VD40010

 UALSU9H0305000
 UALSU9HF030600
 UALSU9HF060300
 UALSU9HR050340
 UALSU9VD070100
 UALSU9VR070170
 5701610000

 CM7060M132R-10
 UALW21HS200290
 UALW21HS072450
 UALSU9VD070400
 UALSU9V0701000
 UALSU9HR030900

 UALSU9HF050500
 UALSU9H0701000
 UALSU9H0208000
 UALSU9H0110000
 UALSC0305GS000

 UALSC0120G0000
 UAL24VK06450CH
 UAL11VL1105000
 RN112-3.6-02-0M4
 RN114-1.2-02-10M
 RN122-0.6-02-47M
 RN122-3-02-4M5

 RN142-1-02-33M
 RN214-2.5-02-3M3
 RN112-2-02-1M0
 RN143-6-02-1M8
 RN214-0.8-02-27M
 RN242-1.4-02-27M
 EXC-X4CH120X

 DLW5BTM102TQ2L
 CMF16-153131
 CMF23H-273141
 744252510
 B82793C0253N201