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# 納入仕様書

## PRODUCT SPECIFICATION FOR INFORMATION

製品名称  
Product Description : Power Choke Coil

貴社品番  
Product Part Number : ETQP5M220YFK

当社品番  
Panasonic Part Number : ETQP5M220YFK

適用(使用機種等)  
Applications :

上記以外の適用に際しては、事前に弊社担当者までご連絡ください。  
For other applications, contact our person signed below.

製造部署  
Manufactured by : Japan (Panasonic Electronic Devices Tajima Co.,Ltd)

### お客様ご使用欄 CUSTOMER USE ONLY

この書類を確かに受領しました。  
This was certainly received by us.

パナソニック エレクトロニクス  
デバイス株式会社  
回路部品ビジネスユニット

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責任者 Approved	検印 Checked	担当者 Designed
<i>K. Amishi</i>	-	<i>M. Ohtanbo</i>

# Panasonic

1. この製品の使用材料は、「化学物質の審査及び製造等の規制に関する法律」に基づき、すべて既存化学物質として記載されている材料です。

All the materials used in this product are registered material under the Law Concerning the Examination and Regulation of Manufacture, etc. of Chemical Substances.

2. 本製品は、モントリオール議定書で規制されているオゾン層破壊物質(ODC)を製造工程及び購入部品・材料で一切使用していません。

This product has not been manufactured with any ozone depleting chemical controlled under the Montreal Protocol.

3. この製品に使用している全ての材料には、臭素系特定難燃物質「PBBOs、PBBs」を含有していません。

All the materials used in this product contain no brominated materials of PBBOs or PBBs as the flame-retardant.

Classification [仕様書名]		SPECIFICATION <u>Power Choke Coil</u> [納入仕様書]			Spec. No. (R-0) [記号番号]			
Part No. [品番]		ETQP5M220YFK (ETQP5M220YFK)			151-ETQP5M220YFK 10-1			
Maximum Rating [最大定格]								
Items [項目]		Specification [規格]						
Operating Temp.[動作保証温度]		-40 ~ 150 °C (Include self temp. rise) [自己温度上昇分を含む]						
Operating Voltage.[動作電圧]		35 V <sub>0-p</sub> max						
Rated Current.[定格電流]		1.6 A ( at Tem. Rise = 15K typ. , DC Current )						
General Items [一般項目]								
Items [項目]		Specification [規格]						
Appearance & Construction [外観・構造]		As specified in the appearance drawing [形状・寸法・表示は外観図による] Type[タイプ] : M0854M Weight (mass) [質量] : 1.9 g ± 0.3g						
Inner Construction [内部構造]		Specified material, grade, thickness shall be used properly. [規定の材質、グレード、材厚のものが正しく使用されていること。]						
Storage Condition.[保管条件]		-5 ~ 35 °C , 85 %RH max						
Electrical Characteristics [電气的特性]								
Items [項目]		Specification [規格]						
Inductance [インダクタンス] AC100kHz, 1Vrms		DC 0A	22.7 μH ± 20 %		series mode			
		HP4284A or equiv. [HP4284A または相当機] (ALC OFF)						
DC Resistance (at20°C) [直流抵抗]		63.0 mΩ ± 10 %						
Insulation Resistance [絶縁抵抗] DC 40V		Term. - Core (Top face) [端子 - コア天面]	10 kΩmin					
Code	Date	Ifo. No.	Code	Date	Ifo. No.	Revised [改訂]		
△			△			Engineering Section		
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Date Established Dec. 12, 2007		Panasonic Electronic Device Co., Ltd.			Approved		Checked	Designed
Date Enforced Dec. 12, 2007					K. ONISHI		-	M. OHTSUBO

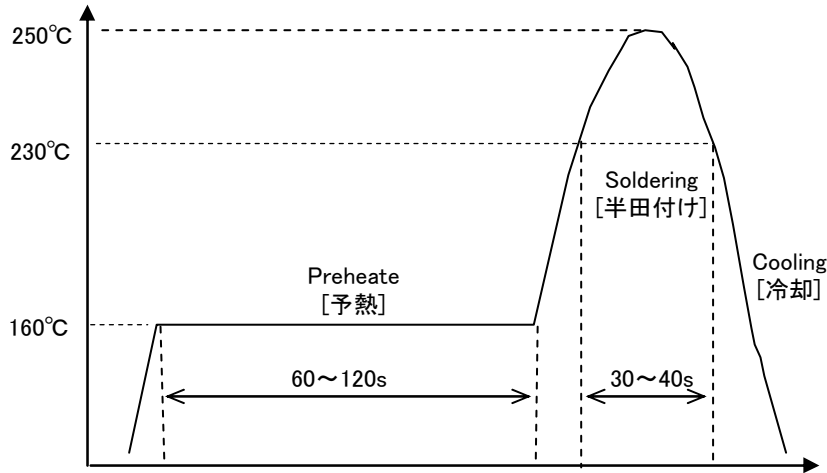
Classification [仕様書名]		SPECIFICATION <i>Power Choke Coil</i> [納入仕様書]			Spec. No. (R-O) [記号番号]		
Part No. [品番]		ETQP5M220YFK (ETQP5M220YFK)			151-ETQP5M220YFK 10-2		
Reliability [信頼性]							
Items [項目]		Specification [規格]					
High Temperature Life [高温寿命] ※1	150±2°C, 2000h, Applying DC 1.6A (Include self temp. rise[自己温度上昇を含む])	Inductance should be within initial Value ±10% [インダクタンスは 初期値の±10%以内] DC Resistance should be within initial Value ±5% [DCRは初期値の±5%以内] Coils shall not have any abnormality in appearance and construction. [外観、構造に異常のないこと]					
Heat Resistance [耐熱性] ※1	150±2°C, 2000h						
Humidity Life [湿中寿命] ※1	85±2°C, 85%RH, 2000h, Applying DC 1.6A						
Moisture Resistance [耐湿性] ※1	85±2°C, 85%RH, 2000h						
Cold Resistance [耐寒性] ※1	-40±2°C, 2000h						
Thermal Shock [熱衝撃] ※1	-40±2°C:10min, 5~35°C:0~5min, 150±2°C:10min, 2000 cycles						
Vibration-resistant [耐振動] ※1	Amplitude width 1.5mm, 10~55Hz /1min, 3 directions (2h each)						Coils shall not have disconnection, and mechanical damage. [断線、機械的損傷のないこと]
※1 前処理条件 : 85±2°C, 85%RH, 168h 後、リフロー半田耐熱性 3回 (条件 : 10-3参照)							
Others characteristic [その他特性]							
Items [項目]		Specification [規格]					
Reflow Solder Heat Resistance [リフロー半田耐熱性]	Temperature profile to mention it in 151-ETQP5M220YFK 10-3 温度条件は 10 - 3 参照	It includes it in a reliability test. [信頼性評価に含む]					
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Recommend condition of Reflow soldering [ リフロー半田推奨条件 ]

The number of times. [回数] : 2 Max. [2回まで]  
 Preheating. : 60 to 120s at 160°C ±10°C  
 Peak temperature. : 5s max. at 250°C ±5°C  
 Retention time. : 30 to 40s at 230°C or more

Part of measurement temperature.  
[温度測定部位]



Repair soldering [補修半田]

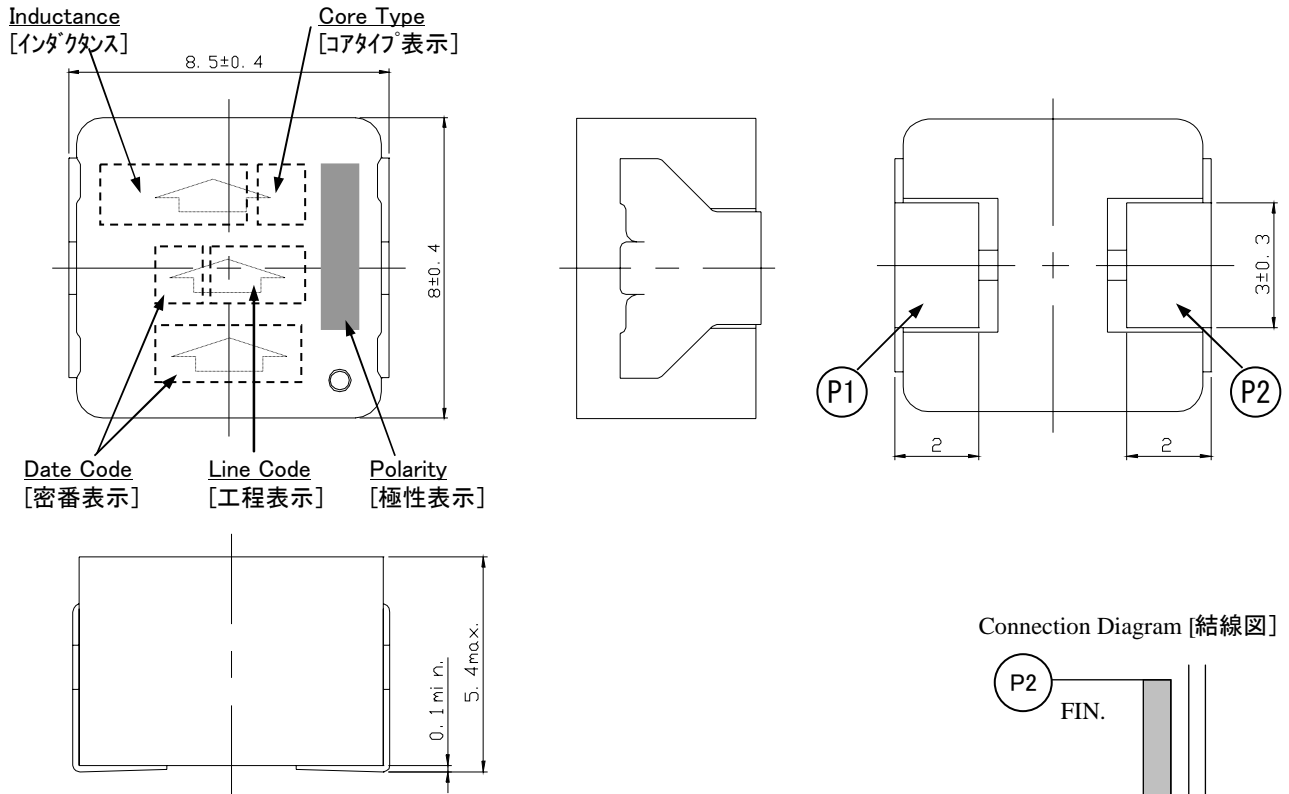
Soldering Iron tip temperature. [こて先温度] : 350±10°C  
 Working time [作業時間] : within 5s.  
 ※Don't touch Soldering Iron tip to Coil. [こて先がコイルに触れないこと。]  
 The number of time [回数] : Two time. [2回]

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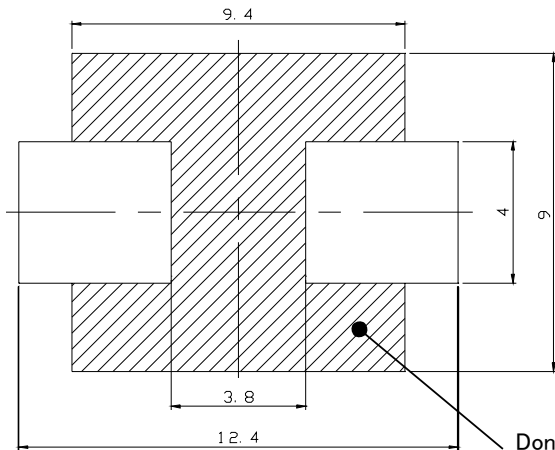
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Appearance [外観図] (Unit: mm, Dimension tolerance of invocation outside [指定外寸法公差]:  $\pm 0.5$ )

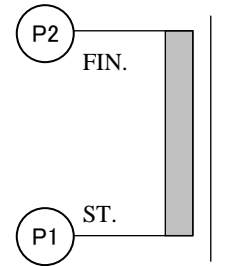


Recommend Surface mount pattern [推奨取付け寸法図]  
(Pad size to be determined by customer. [パッド寸法の決定はカスタマーによる])



Don't wire this portion with PWB.  
[この部分にプリント基板の配線をしないで下さい]

Connection Diagram [結線図]



Marking (Black Ink)

Inductance [インダクタンス] : "220"  
Core Type [コアタイプ] : "Y"

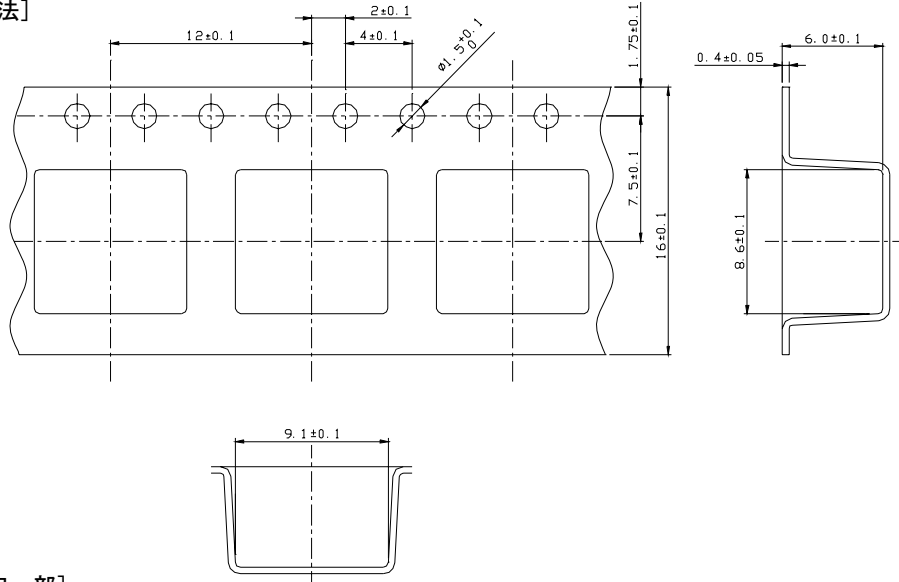
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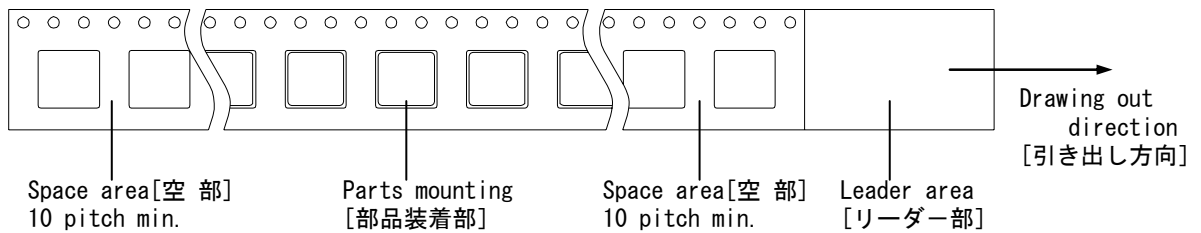
Packaging Form [包装形態] (Taping style [テープスタイル])

1. Taping style [テープスタイル]

(1) Dimension [寸法]

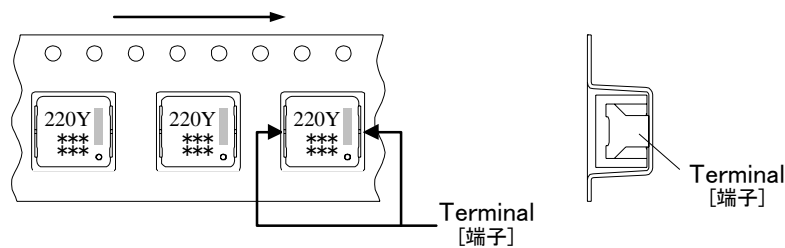


(2) Space area [空 部]



(3) Material : 導電性 PS resin

2. Parts mount direction [部品装着]



- (1) Fall out transformer 2pieces max. in one reel, and not continue.  
[部品の脱落は1リール当たり2ヶ以下で連続していないこと。]

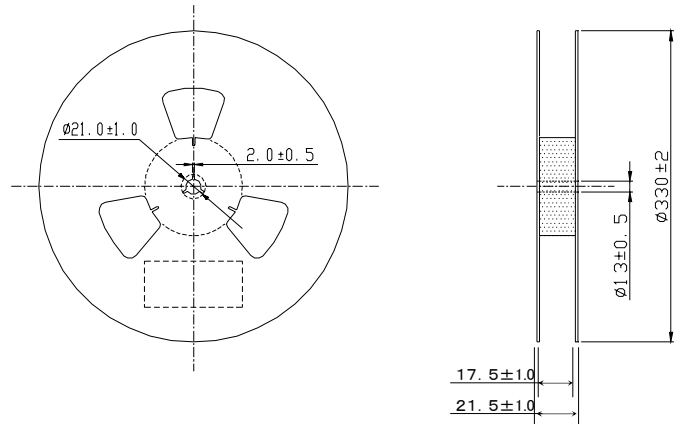
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			10-6

Packaging Form [包装形態] (Blister Packing Tray)

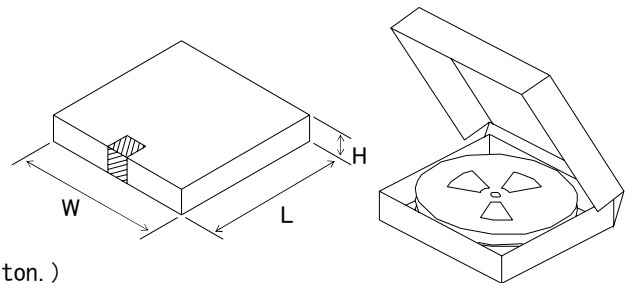
3. Reel dimension [リール寸法]

- (1) 500 pieces in one reel  
[1リール当たりの数量は500個詰とする]
- (2) Marking: part number, quantity, Lot No.  
[表示: 品番、数量、ロットNo]
- (3) Material [材料]:  
Conductive PS resin [導電性<sup>®</sup> スチレン]



4. Minimum Packing [最小荷姿]

- (1) Minimum Packaging Dimension [最小梱包荷姿寸法]  
W = 355 mm  
L = 360 mm  
H = 55 mm  
Tolerance: ± 10 %  
Weight (mass) [質量] ≒ 2.8 kg
- (2) Standard Number [標準詰数]  
1000 pieces in one carton. (2 reels in one carton.)
- (3) Material [材料]: Cardboard [段ボール]



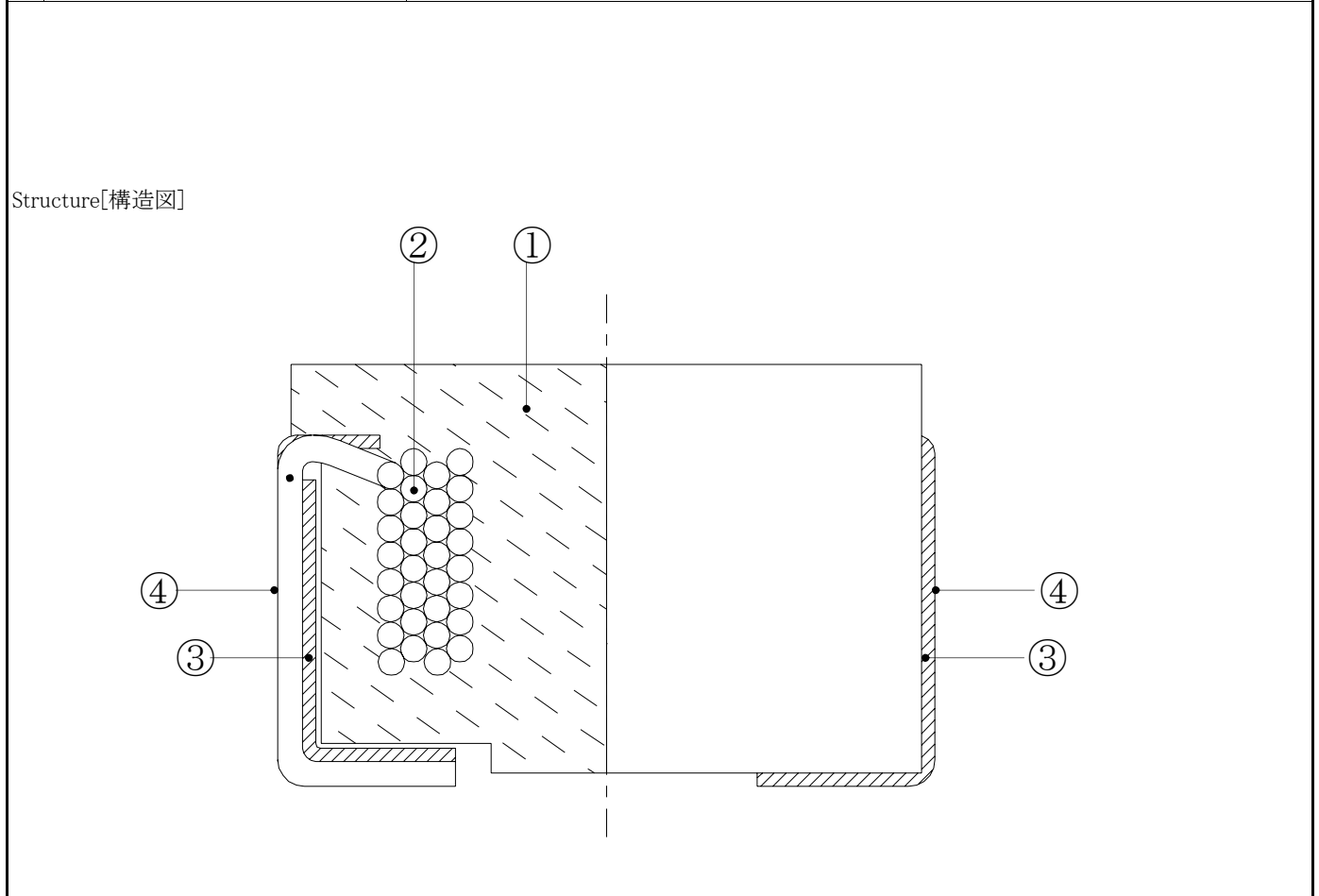
※ Please do not put it in a lengthwise direction  
[縦置きしないで下さい]

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Material List [マテリアルリスト]		
No.	Items [部位] PARTS [部品]	Materials and Dimensions [材料・寸法]
1	コア (Core)	Metal Composite Core [メタルコンポジットコア]
2	巻線 (Winding)	Polyamide-imide Enameled Copper Wire [ポリアミドイミド銅線]
3	端子 (Terminal)	Phosphor Bronze [リン青銅] (Thick [厚み] = 0.15mm)
4	ディップ半田 (Dip solder)	solder dipping [半田ディップ] (SnCu alloy [SnCu系])



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Part No. [品番]	E T Q P 5 M 2 2 O Y F K (E T Q P 5 M 2 2 O Y F K)		[記号番号] 151-ETQP5M22OYFK
			10-8

Cautions for Use [ご使用上の注意事項], Cautions for Safety [安全上の注意事項]

1. Provision to Abnormal Condition (異常対策)

This power choke coil itself does not have any protective function in abnormal condition such as overload, short-circuit and open-circuit conditions, etc. Therefore, it shall be confirmed as the end product that there is no risk of smoking, fire, dielectric withstand voltage, insulation resistance, etc. in abnormal conditions to provide protective devices and/or protection circuit in the end product.  
(当パワーチョークコイルは、過負荷及びショート・オープン等の異常時に対し、単品での保護機能を有しておりませんので、必ずセットで保護装置、保護回路で対策し、発煙・発火、絶縁耐力、絶縁抵抗等の問題の無い事を、確認して下さい。)
2. Temperature Rise (温度上昇)

Temperature rise of power choke coil depends on the installation condition in end products. It shall be confirmed in the actual end product that temperature rise of power choke coil is in the limit of specified temperature class.  
(パワーチョークコイルの温度上昇は実装状態によって変わりますので、必ずセット実装時で、規定の絶縁クラス以下となる事を確認の上で御使用下さい。)
3. Dielectric Strength (絶縁性能)

Dielectric withstanding test with higher voltage than specific value will damage Insulating material and shorten its life.  
(規定の絶縁耐力以上の耐圧試験は、絶縁寿命の劣化につながりますので、御注意下さい。)
4. Water (水)

This Power choke coil must not be used in wet condition by water, coffee or any liquid because insulation strength becomes very low in the condition.  
(水、コーヒーなど液体に濡れた状態では絶縁性能が大幅に低下していますので、この様な状態では、使用しないで下さい。)
5. Potting (封止)

If this power choke coil is potted in some compound, coating material of magnet wire might be occasionally damaged. Please ask us if you intend to pot this power choke coil.  
(パワーチョークコイルを樹脂などで封止されると、銅線の絶縁被膜劣化などを引き起こす場合がありますので、この様な場合は一度当社に御相談下さい。)
6. Model (使用機種)

When this power choke coil was used in a similar or new product to the original one, sometimes it might be unable to satisfy the specifications due to difference of condition of usage. Please ask us if you would use this power choke coil in the manner such as above.  
(セットの類似展開などで、他のセットに当パワーチョークコイルを使用する場合、使用条件等の違いにより性能を全て満足しない場合があります。この様な場合は、一度当社に御相談下さい。)
7. Drop (落下)

If the power choke coil suffered mechanical stress such as drop, characteristics may become poor (due to damage on coil bobbin, etc.). Never use such stressed power choke coil.  
(落下等、機械的ストレスが加わったパワーチョークコイルは、性能が大幅に低下している可能性があります(ボビン等に割れが発生する)ので、この様なパワーチョークコイルは使用しないで下さい。)

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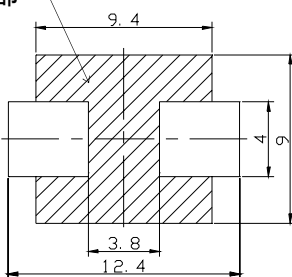
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Cautions for Use [ご使用上の注意事項], Cautions for Safety [安全上の注意事項]

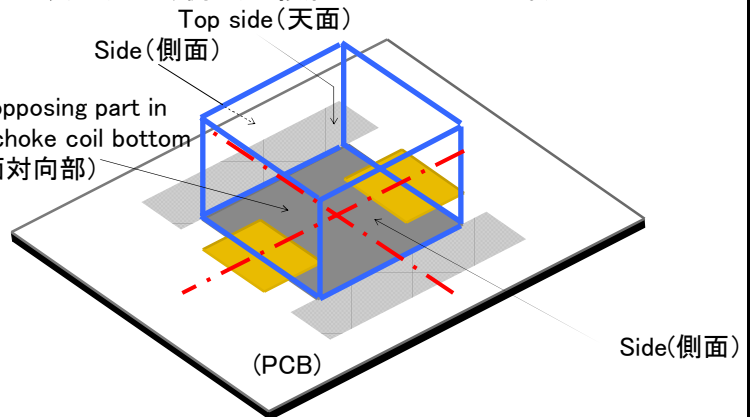
8. Printed circuit board design(回路基板設計)

- (1) To the opposing part in this power choke coil bottom (チョークコイル底面の対向部には、パターン、ビア等を設けないで下さい。)  
Please install neither pattern nor the beer, etc. (表面(天面、側面)に接触させないで下さい。)
- (2) Parts arranged around this power choke coil do not touch the surface of this power choke coil (Top side and side). (チョークコイルの周辺に配置される部品は、チョークコイルの表面(天面、側面)に接触させないで下さい。)

The opposing part in the choke coil bottom  
底面对向部



The opposing part in the choke coil bottom  
(底面对向部)



- (3) This power choke coil is different from the ferrite core-type that installs general concentration GAP. It has the leakage magnetic bunch distribution of the choke coil to the vertical direction. Please note it enough when parts and the circuit compositions in using the influence of the leakage flux is received easily. (本チョークコイルは一般的な集中GAPを設けたフェライトコアタイプとは異なり、チョークコイルの上下方向への漏れ磁束分布をもちます。漏れ磁束の影響を受けやすい部品や回路構成をご使用される場合には十分ご注意ください。)

9. Solvent (耐溶剤性)

If this power choke coil is dipped in the cleaning agent, and the coating agent of the toluene and the xylene system, there is a possibility that the performance decreases greatly. Please ask us if you intend to pot this power choke coil. (本チョークコイルをトルエン、キシレン系の溶剤、洗浄剤、コーティング剤に長時間浸漬させると性能が大幅に低下する可能性があります。この様な場合は一度当社に御相談下さい。)

10. Static electricity measures (静電気対策)

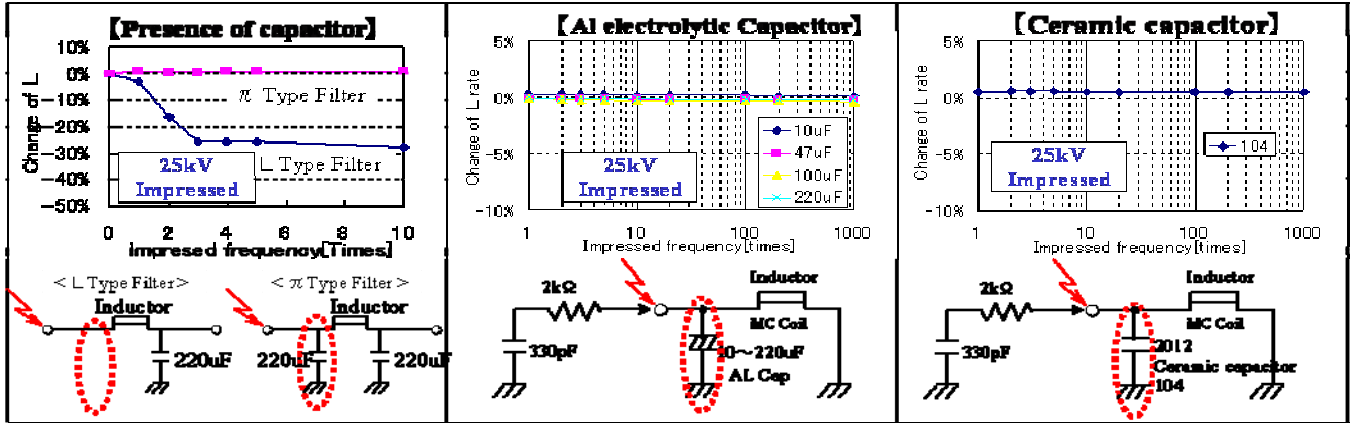
<Circuit design (回路設計)>  
Please set up the ESD measures parts such as capacitors in the former steps of this power choke coil for static electricity when there is a possibility that static electricity is impressed to the choke coil on the circuit. Moreover, please consult our company about such a case once. Please refer to the example of measures to next page. (回路上で部品に静電気が印加される可能性がある場合、本チョークコイルの前段には耐静電気用にコンデンサなどESD対策部品を設置してください。また、この様な場合は一度当社に御相談下さい。対策例は次ページ参照下さい。)  
<Treatment with single (単品取扱い)>  
I hope the static electricity measures the handling of this power choke coil single. (process and equipment)  
There is a possibility that the characteristic changes when the voltage of 200V or more is impressed to this power choke coil. Please handl 200V or less. (チョークコイル単品の取扱いには静電気対策をお願いします。(工程・設備)  
200V以上の電圧が本チョークコイルに印加されますと特性が変化する可能性があります。  
200V以下での取扱いをお願いします。)

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Part No. [品番]	ETQP5M220YFK (ETQP5M220YFK)		[記号番号] 151-ETQP5M220YFK
			10-10

Cautions for Use [ご使用上の注意事項], Cautions for Safety[安全上の注意事項]

**Example of examining circuit mounting ESD in our company  
(当社での回路実装ESD検証例)**



(ESD Machine: NOISEKEN ESS-200AX / TC-815D(F), LsQ: HP4284A at 100kHz (9Vrms)) It conforms to EN/IEC6100-4-2.

The faction that doesn't use the capacitor for the former steps decreases Inductance of this choke coil. This is because MC core between terminals did the insulation destruction.

(前段のコンデンサーを使用していない系は、チョークコイルのインダクタンスが低下する。これは、端子間のMCコアが絶縁破壊を起こしているからである。)

Standard of capacity of measures capacitor  
(対策コンデンサー容量の目安)

≥10uF Aluminum electrolytic capacitor (アルミ電解) or ≥0.1uF Ceramic capacitor (セラミック)

Please consult our company once because it is a standard to the end.

(あくまで目安ですので当社に一度相談下さい)

11. Other using environment (その他使用環境)

This power choke coil doesn't become a design that considers use in the following, special environment. Therefore, please do not use it in the following special environment.

- Use in place where a lot of causticity gases such as sea breeze, Cl<sub>2</sub>, H<sub>2</sub>S, NH<sub>3</sub>, SO<sub>2</sub>, and Nox exist.
- Use in place where out-of-door exposure and direct sunshine strike.

(本チョークコイルは下記の特種環境での使用を配慮した設計にはなっておりません。従って、下記特種環境ではご使用しないで下さい。)

- (・潮風、Cl<sub>2</sub>、H<sub>2</sub>S、NH<sub>3</sub>、SO<sub>2</sub>、Noxなどの腐食性ガスの多い場所での使用。)
- (・屋外暴露、直射日光のあたる場所での使用。)

12. Keeping environment (保管環境)

If this power choke coil is kept under following environment and condition, there is a possibility that the performance and soldering decreases greatly.

- Keep in place where a lot of causticity gases such as sea breeze, Cl<sub>2</sub>, H<sub>2</sub>S, NH<sub>3</sub>, SO<sub>2</sub>, and Nox exist.
- Keep in place where out-of-door exposure and direct sunshine strike.

(本チョークコイルは下記の環境および条件で保管されますと、性能劣化や半田付け性等の性能に影響を受ける可能性がありますので、下記環境での保管は避けて下さい。)

- (・潮風、Cl<sub>2</sub>、H<sub>2</sub>S、NH<sub>3</sub>、SO<sub>2</sub>、Noxなどの腐食性ガスの多い場所での保管。)
- (・屋外暴露、直射日光のあたる場所での保管。)

Code	Date	Ifo. No.	Code	Date	Ifo. No.	Revised [改訂]
△			△			
△			△			
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