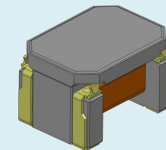
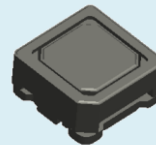
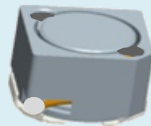
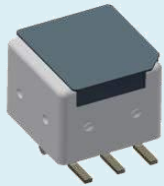


MITSUMI

汽车/电感线圈

2013-11



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Reserved

Coil Lineup for Automotive

2/26

Current line-up

Under development

仪表板

CP, CZ, CY, CK, CXG



CAR-NX



信息与通信设备

Car audio, Navigation



CAR-NX



电子控制单元

CMT-453230NX



IGBT

回扫变压器



动力传动机构

Electric control unit

CAR-TX



Body

Electric control unit

CAR-NX

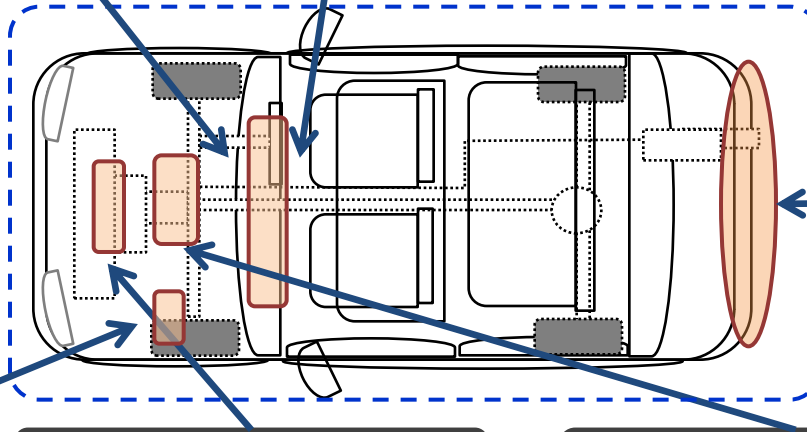
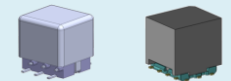


Corner sensor

K5-R2 K5-R3 K7-R K5-

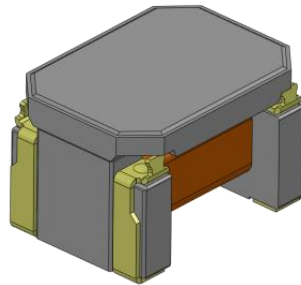


TBR



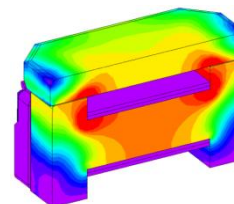
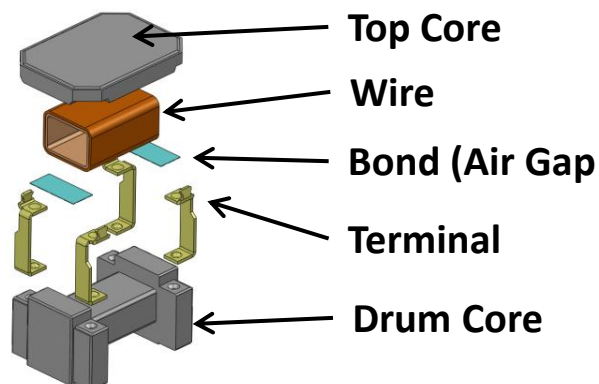
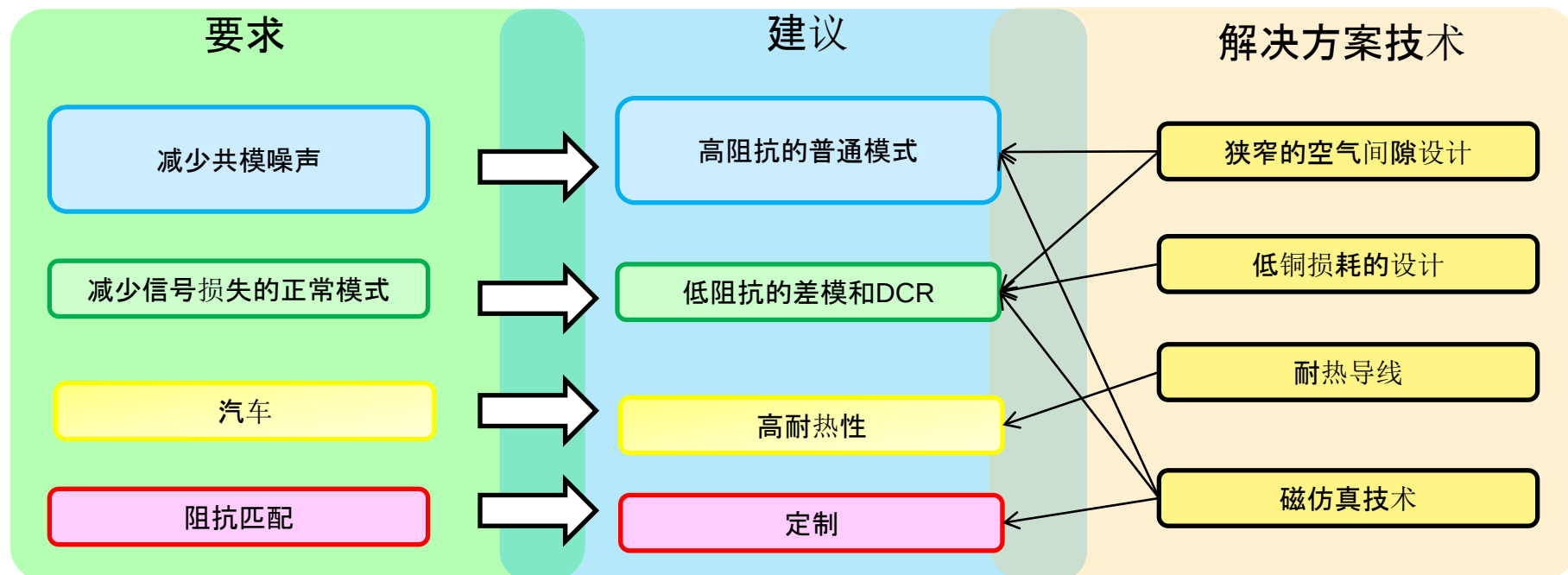
= CONFIDENTIAL =

Common mode choke coil



共模扼流圈的概念

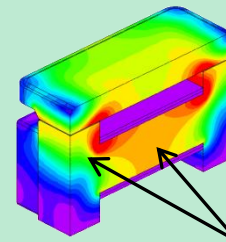
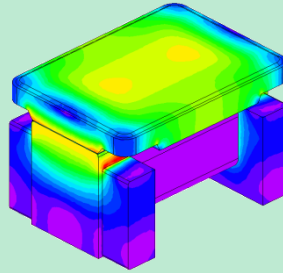
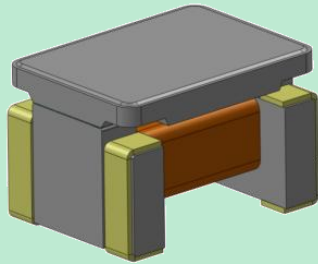
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Magnetic Simulation

Common mode choke coil simulation

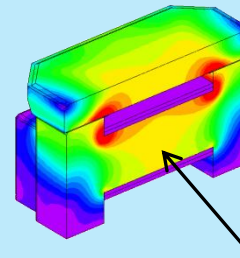
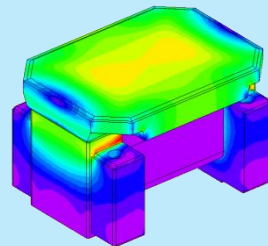
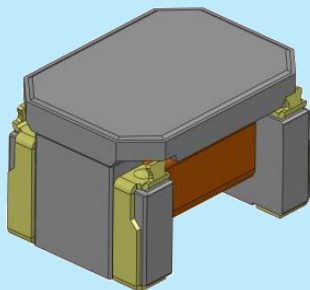
TDK ACT45B



高磁通密度

由于不平衡设计的核心,磁通密度是在本地。

MITSUMI Model



平衡磁通密度

由于采用模拟技术的核心,磁通密度不聚集作为竞争对手的一个理想的设计。

Benchmark

6/26

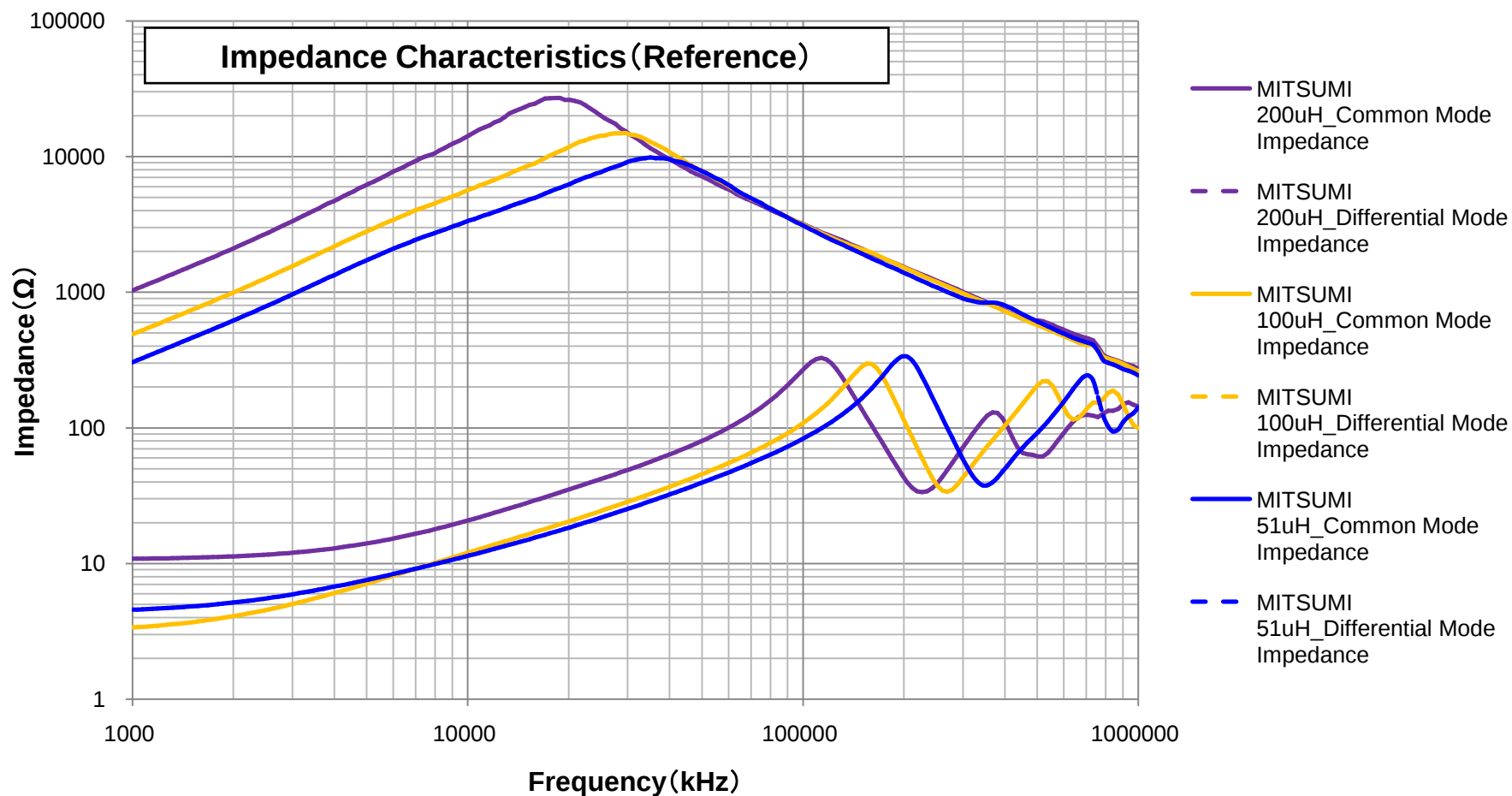
Maker	TDK	MITSUMI
Part name	ACT45B-510-2P	CMT-453230NX
Appearance		
Size (mm)	4.5 x 3.2	4.5 x 3.2
Height (mm)	3.0 max.	3.0 max.
Inductance (uH)	51 +50/-30%	51 +50/-30%
DCR [1-4] (mOhm)	740	540
DCR [2-3] (mOhm)	780	600
Rated Current (A)	0.2	0.2

Low DCR
23~27% down

MITSUMI 共模扼流圈

阻抗特性

7/26



= CONFIDENTIAL =

Development Schedule

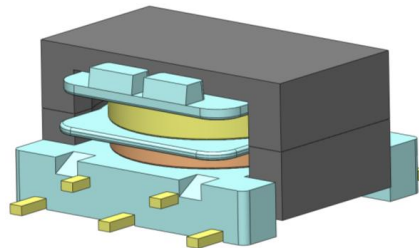
8/26

	'13/7	8	9	10	11	12	'14/1	2	3	4	5
Mitsumi Schedule	TS →	ES1 →	Reliability (AEC-Q200) →				ES2 →			MP →	

Aug.2013
Trial sample

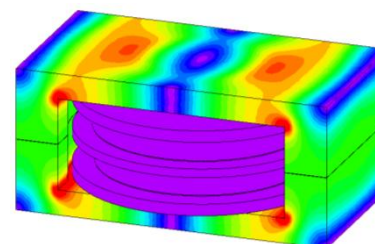
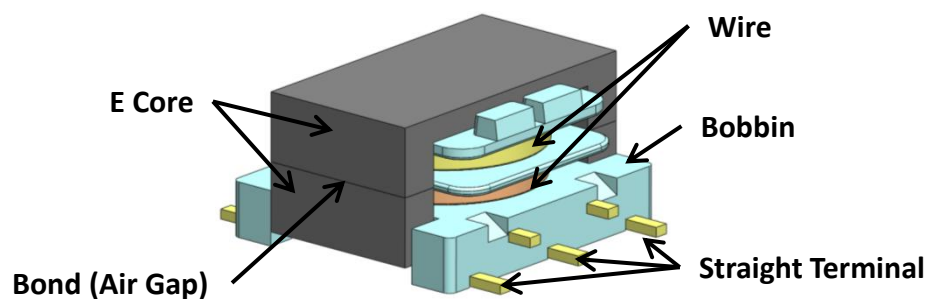
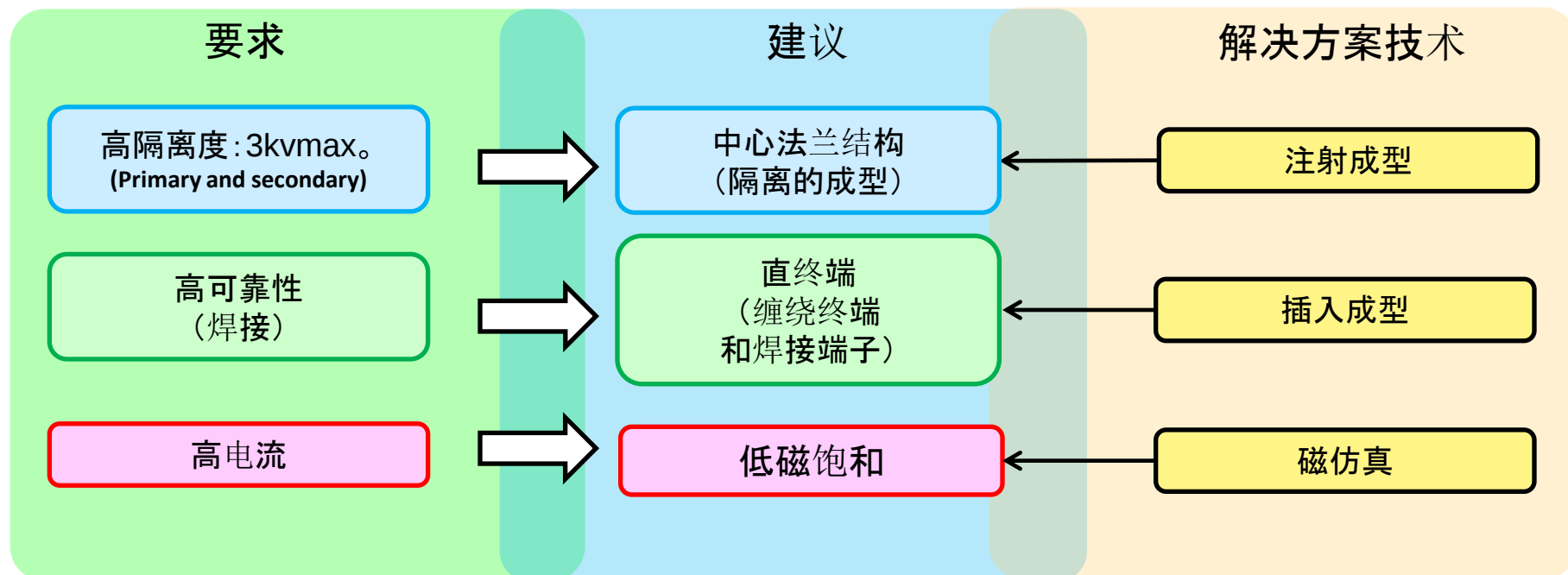
Jan.2014
Mass production sample

回扫变压器



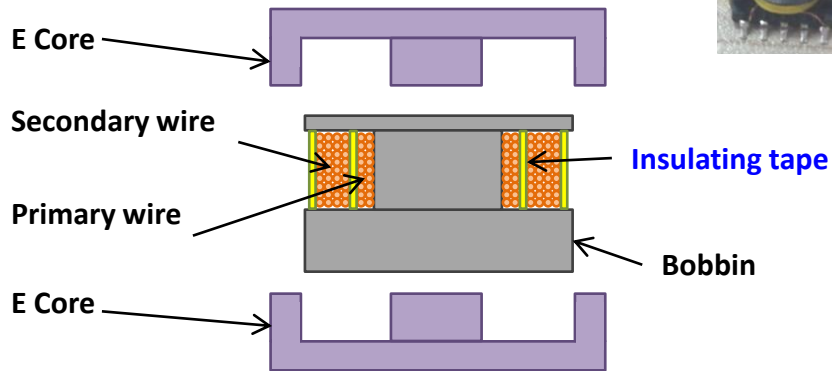
回扫变压器的概念

10/26

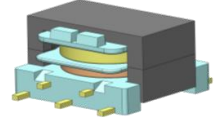
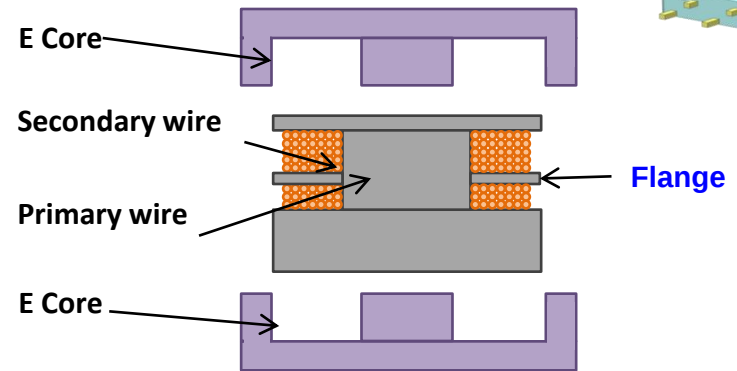


Magnetic Simulation

< Current model; Mitsumi TR11 >



< New Model >



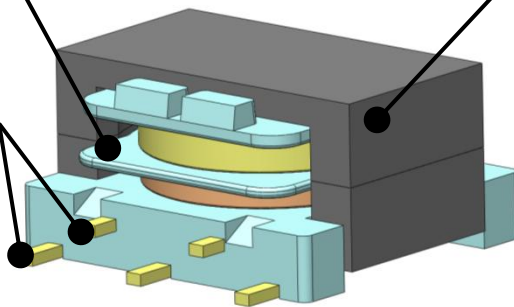
1) 高隔离

高绝缘可靠地保证筒子架用绝缘胶带可剥离的比较。

2) 防止制动线(直终端)

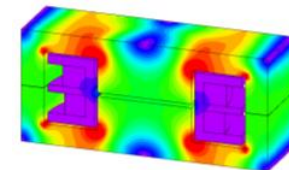
缠绕终端和焊接端子分离。
因此, 能够避免刹车线的线轴热收缩和保持良好的共面性。

< Feature >



3) 磁路设计

高电流允许由于磁仿真避免局部磁饱和。



Development Schedule

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	2013 Sep.	Oct.	Nov.	Dec.	2014 Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.
Mitsumi Schedule	TS →	ES1 →	Reliability test (AEC-Q200) →				ES2 →				MP →

Oct. 2013

**Available to submit
Trial sample**

Mar.2014

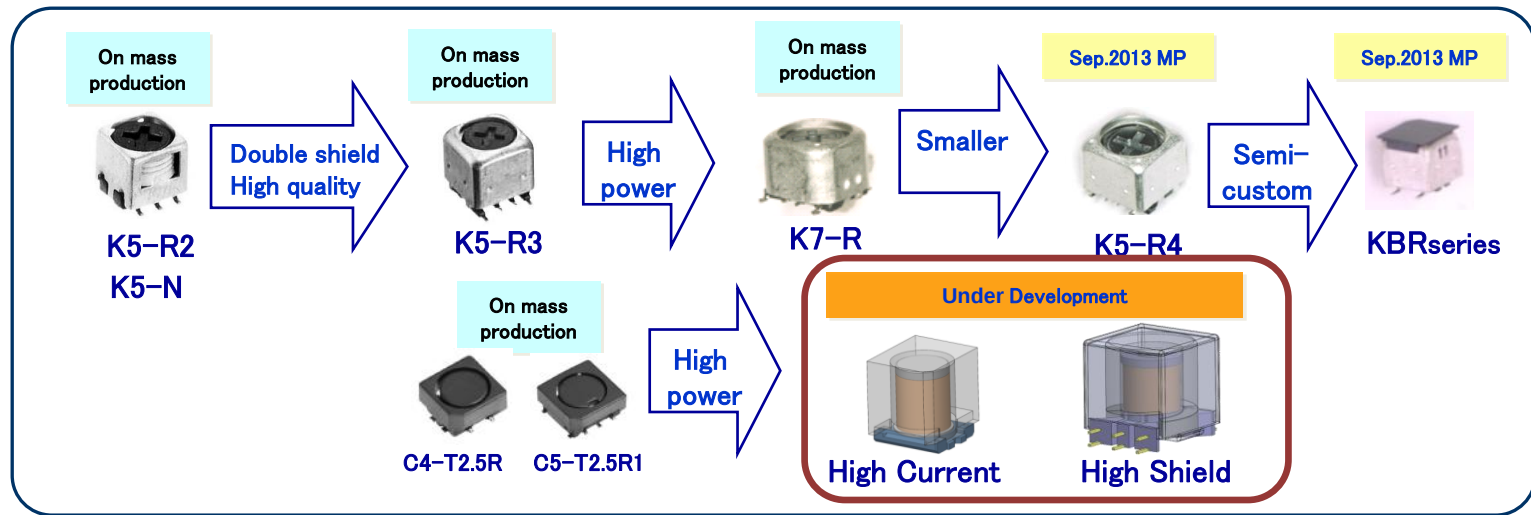
**Available to submit
Mass production sample**

Corner sensor Coils



Corner sensor Coils Lineup

14/26



ModelName	Dimension (mm)	Height (mm MAX)	Inductance (mH MAX)	Current (mA)	Adjustability	Double shield Case	Number of terminal
K5-N	5.6 × 5.6	6	4.0	200	○	×	5
K5-R2	5.6 × 5.6	7.2	6.7	250	○	×	5
K5-R3	6.6 × 6.6	7.25	4.0	250	○	○	4
K7-R	8.4 × 8.4	7.3	12.0	600	○	○	4
C4-T2.5R	4.5 × 4.5	2.5	5.0	300	×	×	4
C5-T2.5R1	5.0 × 5.0	2.5	5.5	300	×	×	5
K5-R4	7.0 × 7.0	7.1	5.8	500	○	○	5
KBRseries	7.4 × 7.2	7.1	5.0	500	○	○	5

①可调电感性狭窄与核心。

Applicable model : K-type models

②无焊区没有金属的弱点

Applicable model : K5-R3, K5-R4, K7-R,KBRseries

③块断带双屏蔽外磁。

Applicable model : K5-R3, K5-R4, K7-R,KBRseries

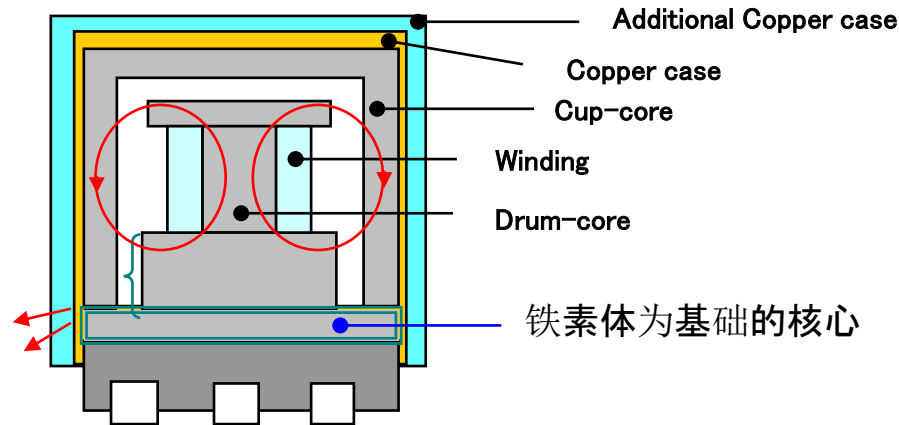
④降低漏磁通在铁氧体磁芯额外的基础。

Applicable model : K5-R4,KBRseries

K5-R4, KBRseries Feature

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提高磁屏蔽效率与闭合电路结构具有可调结构，漏磁小。



K5-R4、KBRseries

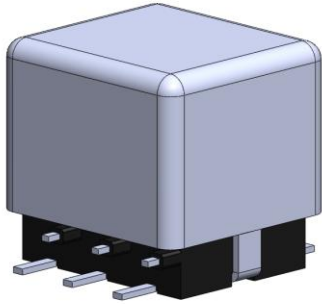
<<POINTS>>



1. 封闭基铁氧体磁芯的漏磁。
2. 外铜案标准设备
3. 高精度预置电感值

Transformer Feature

17/26



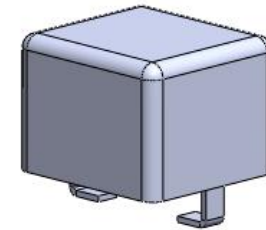
KBR-767070NX
(Reference model)

Feature

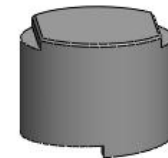
- 在核心采用锥形结构, 这使得窄公差电感线圈.
- 屏蔽特性很好因为它是覆盖着铜案.
- 该线圈的防脱结构.

Sample schedule

- Engineering sample Jan.2014
- Commercial sample Nov.2014
- Mass Production Dec.2015



CASE
(C1100)



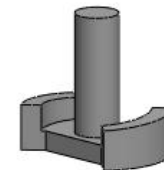
POT-CORE
(Mn-Zn)



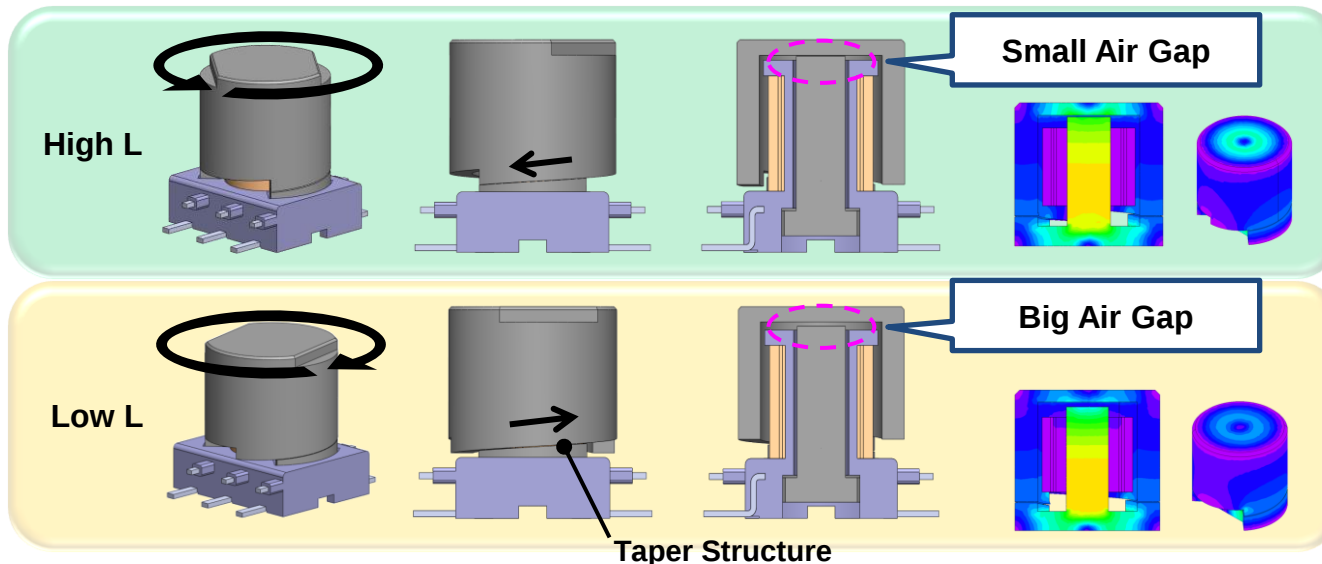
WIRE
(Enamel)



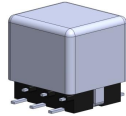
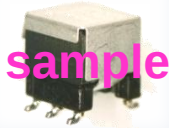
BASE
(LCP)



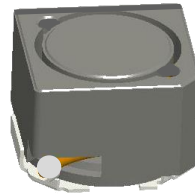
T-CORE
(Mn-Zn)



REFERENCE

	MITSUMI TBR-767070NX 	EPCOS Actual sample data 
SIZE	7.6 x 8.5 (Terminal)	7.6 x 8.7 (Terminal)
Height	7.0 max.	7.0 typ.
Winding ratio	1 : 1 : 8.4	—
Inductance f=50kHz	3.20mH	3.20mH
Initial inductance tolerance	±4%	(±8%)
DC-Resistance	21.9Ω (4-6) 1.35Ω (1-2) 1.38Ω (2-3)	31.3Ω (4-6) 1.59Ω (1-2) 1.60Ω (2-3)
Q	31.0 (4-6)	29.5 (4-6)
IDC at L-10%	800mA (1-2) (2-3) 100mA (4-6)	600mA (1-2) (2-3) 70mA (4-6)
Susceptibility to external magnetic fields in any orientation “k”	0.5 x 10 ⁻⁴ Target spec	0.5 x 10 ⁻⁴
Coupling Capacitance (4-2)	6.0pF	17.7pF

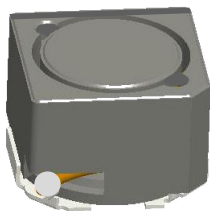
Inductor for Automotive



Inductor : CAR-NX Series

20/26

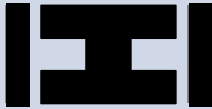
CAR-NX Series



CAR-NX

高耐热性
低噪声

<特点>-耐高温;150deg-c(评价)
-“铁氧体芯屏蔽”型
-低噪声
-激光焊接可靠性高

Model	Size (mm)	Height (mm)	Inductance (uH)	DCR typ. (m ohm)	IDC typ. (A) L-30%	Shield type
CAR-606048NX	6.0 x 6.0	4.8 max.	1.5 - 100	18 - 560	0.7 - 5.5	 Ferrite Core Shield
CAR-707050NX	7.0 x 7.0	5.0 max.	1.5 - 100	16 - 368	1.0 - 8.0	
CAR-A0A048NX	10 x 10	4.8 max.	1.5 - 100	14 - 240	1.8 - 9.0	

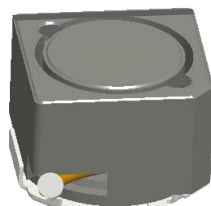
Development schedule

CAR-707050NX (2014月12月 MP), CAR-606048NX (2014年12月 MP)CAR-A0A0A0NX (2014年12月 MP)

Inductor: CAR-TX Series

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CAR-TX Series



CAR-TX

高耐热性
铁核心保护

<特点>-耐高温;180deg-c(评价)
-“铁氧体芯屏蔽”型
-低噪声
-激光焊接可靠性高

Model	Size (mm)	Height (mm)	Inductance (uH)	Shield type
CAR-707040TX	7.0 x 7.0	4.0 max.	1.5 - 100	 Ferrite Core Shield
CAR-A0A048TX	10 x 10	4.8 max.	1.5 - 100	

Development schedule

CAR-707040TX (2014年10月 MP), CAR-A0A048TX (2014年10月 MP)

传统的线圈



Inductor: CK Series

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CK Series



<特点>

- “铁氧体芯屏蔽”型
- 低漏磁通
- 高电流和低电阻

Model	Size (mm)	Height (mm)	Inductance (uH)	DCR typ. (m ohm)	IDC typ. (A) L-30%	Shield type
C4-K Series	4.8 × 4.8	1.9 ~ 3.0	1.0 - 150	12 ~ 2,100	0.20 ~ 3.50	 閉磁路構造
C5-K Series	5.6 × 5.6	1.8 ~ 3.0	1.0 - 820	10 ~ 3,800	0.15 ~ 5.00	
C6-K Series	6.6 × 6.6	2.0 ~ 5.0	1.0 - 3,300	8 ~ 10,700	0.21 ~ 9.00	
C8-K Series	8.0 × 8.0	4.0 ~ 5.0	1.0 - 5,600	10 ~ 14,000	0.11 ~ 10.30	
C10-K Series	10.0 × 10.0	3.0 ~ 4.0	1.0 - 4,700	11 ~ 12,700	0.15 ~ 7.10	
C12-K Series	11.5 × 11.5	4.5 ~ 7.5	1.0 - 5,600	6 ~ 5,500	0.28 ~ 23.5	
C13-K Series	13.0 × 13.0	4.5	1.0 - 150	8 ~ 339	1.33 ~ 11.0	

Inductor : CP Series

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CP Series



<特点>

- “铁氧体粉体的屏蔽”型
- 高电流和低电阻
- 激光焊接可靠性高
- 与更广泛的终端的抗冲击结构

Model	Size (mm)	Height (mm)	Inductance (uH)	DCR typ. (m ohm)	IDC typ. (A) L-30%	Shield type
C3-P1.0R	3.0 x 3.0	1.0 max.	1.0 - 10	100 - 630	0.57 - 1.70	 開磁構造 疑似閉磁路構造  ↑ ↑ 磁性接着剤
C3-P1.2R		1.2 max.	1.2 - 47	55 - 1,300	0.26 - 1.50	
C3-P1.2RA		1.2 max.	1.0 - 18	65 - 750	0.52 - 2.00	
C3-P1.5R		1.5 max.	1.5 - 47	58 - 1,050	0.33 - 2.40	
C4-P1.5R	4.0 x 4.0	1.5 max.	1.0 - 47	45 - 850	0.35 - 2.85	
C4-P1.8R		1.8 max.	1.2 - 68	40 - 920	0.37 - 2.70	

IFT for Radio Tuner

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频率转换间

调幅/调频的频率调谐用户间, 振荡器电路.

1) We are preparing 5mm square size, through hole pin and SMT type.

K5-C



M5-H1



K5-N



M5-N



Model	Size (mm)	Height (mm)	L (mH)	Operational Frequency (MHz)	Purpose	Type
K5-C	5.6 x 5.6	6.5 max.	1 - 1000	0.1 - 20	AM-IFT, FM-IFT, AM-OSC	PIN
M5-H1	5.5 x 5.5	6.3 max.	0.03 - 130	10 - 200	FM-RF, FM-OSC	PIN
K5-N	5.6 x 5.6	6.0 max.	1 - 5900	0.1 - 20	AM-IFT, FM-IFT, AM-OSC	SMD
M5-N	5.6 x 5.6	6.0 max.	0.03 - 30	3 - 200	FM-RF, FM-OSC	SMD



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MITSUMI PHILIPPINES, INC.

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