

KV ELECTRONICS CO., LTD. 988 MOO 2, SOI THETSABAN BANG PU 60 TUMBOL THAI BAN, AMPHUR MUANG SAMUTPRAKARN 10280 TEL. +66(0) 2701-2969, FAX +66(0) 2701-2966 E-MAIL : kvea@loxinfo.co.th	Customer name : Electronic source Customer part no. : ES00147-REV06 Drawing no. : Description : Transformer EF-20 (B-2) KV no. : 13304 Revision : 06 Page 1 of 3 
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Issue date 17 July 2013	For KV	Released by 	Checked by 	Approve by 
	For Hitachi	Approve by		

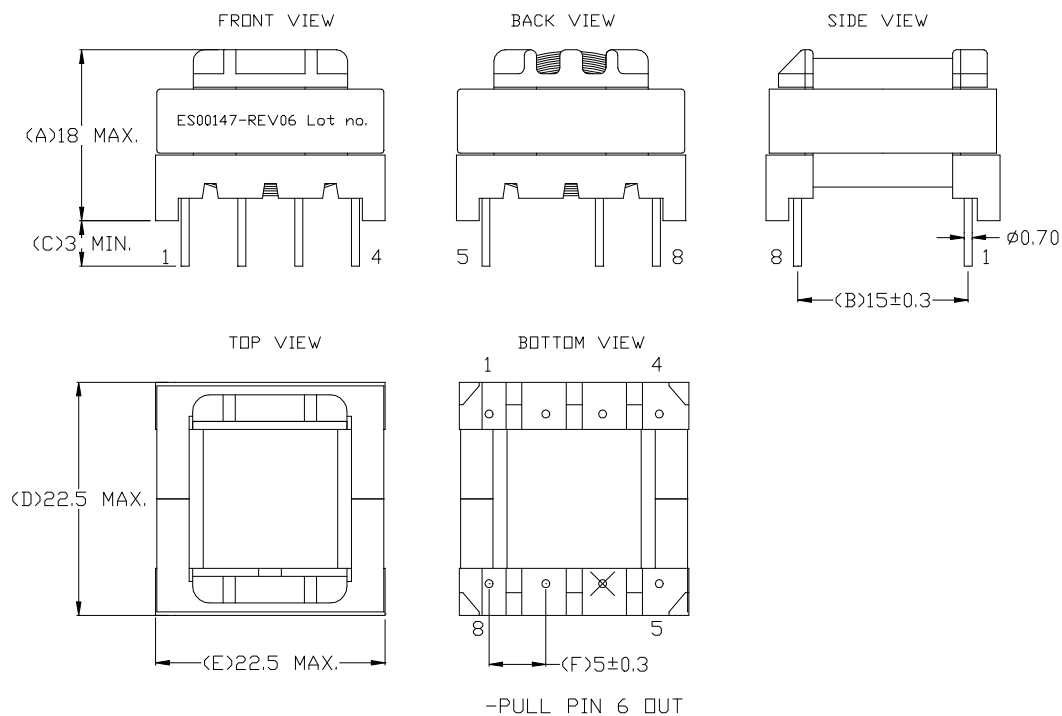
Rev.	Date	Effective	Revise description	Page.
01	31-Jul-13	31-Jul-13	- Add pull pin 6 out in drawing. - Add Copper-Foil 0.05mm. X 10mm. In components list.	2
			- Change from S1 pin 6-7 to S1 pin 7-5	3
			- Change from S2 pin 8-6 to S2 pin 8-7	3
02	27-Sep-13	27-Sep-13	- Change from P1 pin 2-1 to P1 pin 3-4	3
			- Change from B1 pin 3-4 to B1 pin 2-1	3
03	30-Oct-13	30-Oct-13	- Change from B1 pin 2-1 to B1 pin 1-2	3
04	29-Nov-13	29-Nov-13	- Change from B1 pin 1-2 to B1 pin 2-1	3
05	26-Aug-14	26-Aug-14	- Add kapton tape in components list.	2
06	08-Sep-14	08-Sep-14	- Change from Customer part no. ES00147 to Customer part no. ES00147-REV06	1
			- Add Teflon tube in components list.	2
			- Change from marking ES00147 Lot no. to marking ES00147-REV06 Lot no. in drawing.	2
			- Add 2-UEW Copper wire in components list.	2
			- Cancel or equivalent of material all in components list.	2
			- Change from DC-Resistance (DCR) Pin 3 – 4 = 3.00 Ohm Max. to DC-Resistance (DCR) Pin 3 – 4 = 2.25 Ohm ± 15%	3
			- Add DC-Resistance (DCR) Pin 2 – 1 = 0.200 Ohm ± 15%	3
			- Add DC-Resistance (DCR) Pin 7 – 5 = 18.00 mOhm ± 15%	3
			- Add DC-Resistance (DCR) Pin 8 – 7 = 10.20 mOhm ± 15%	3
			- Add Impulse test Apply DC 1200V Pin 3 – 4 Wave from area size 15% Max.	3
			- Add Impulse test Apply DC 1200V Pin 3 – 4 Differential area size 35% Max.	3
			- Add Impulse test Apply DC 1200V Pin 2 – 1 Wave from area size 15% Max.	3
			- Add Impulse test Apply DC 1200V Pin 2 – 1 Differential area size 35% Max.	3
			- Add Impulse test Apply DC 1200V Pin 7 – 5 Wave from area size 15% Max.	3
			- Add Impulse test Apply DC 1200V Pin 7 – 5 Differential area size 35% Max.	3
			- Add Impulse test Apply DC 1200V Pin 8 – 7 Wave from area size 15% Max.	3
			- Add Impulse test Apply DC 1200V Pin 8 – 7 Differential area size 35% Max.	3



1. Components list.

<u>Item.</u>	<u>Material.</u>	<u>Manufacturer.</u>
1. Bobbin	Phenolic (UL94V-0)	Chang chun plastic co., ltd UL no. E59481(S).
2. Core EE-20 Core EF-21	DMR40 PC40	DMEGC. Ou Ge.
3. Copper wire	Polyurethane enameled copper 2-UEW (130 deg.c).	Thai hitachi enamel wire co., ltd. UL no. E137472. Pacific-Thai electric wire & cable co.,ltd. UL no. E142108.
4. T.I.W. wire	Tripple insulating wire (130 deg.c)	Dah Jin Technology.co.,ltd UL no. E236542.
5. Insulation tape	Polyester #1350F-1 (130 deg.c) Polyester #35660 (130 deg.c)	3M UL No.E17385. Symbio INC UL.no. E50292.
6. Tube	Teflon (PTFE-2)	Thai scantube co.,ltd UL.no. E151086.
7. Kapton tape	Polyimide film insulating tape with silicone base adhesive, Cat. No. KA180K	Symbio Inc. UL No.E50292.
8. Solder bar	Sn / Cu	Ultra core.
9. Varnish	Ultimeg 2000/380	A.E.V PLC UL no. E220579.

The drawing and dimension in millimeter unit.



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988 MOO 2, SOI THETSABAN BANG PU 60

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E-MAIL : kvea@loxinfo.co.th

Customer name : Electronic source

Customer part no. : ES00147-REV06

Drawing no. :

Description : Transformer EF-20 (B-2)

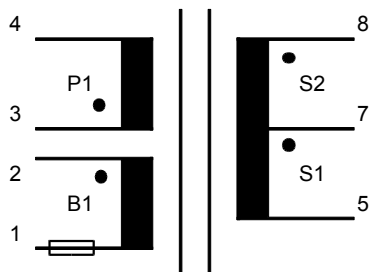
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2. Schematic diagram and winding instruction.



- P1 Pin 3-4 = Wire 0.18 mm. / 108 Ts.
Insulation 1 Ts.
- B1 Pin 2-1 = Wire 0.18 mm. X2 / 17 Ts.
Insulation 3 Ts.
- S1 Pin 7-5 = TEX-E Wire 0.45 mm. X2 / 8 Ts.
Insulation 1 Ts.
- S2 Pin 8-7 = TEX-E Wire 0.40 mm. X2 / 3 Ts.
Insulation 2 Ts.

Note : S1,S2 Use kapton tape
Pin 1 Use Teflon tube

3. Electricals specification and test data (at 25 deg.c).

Item	Pin no.	Specification	Test data									
			1	2	3	4	5					
Inductance (L) At 10KHz, 1V	3 – 4	2.11 mH +/-10%	20.10	2.10	2.04	2.13	2.02					
Leakaged Inductance At 10KHz, 1V (LK) (Shorted 1,2,5,7,8)	3 – 4	63.29 uH Max.	32.20	33.80	23.90	31.80	32.50					
DC-Resistance (DCR)	3 – 4	2.25 Ohm ± 15%	2.24	2.23	2.27	2.26	2.24					
	2 – 1	0.200 Ohm ± 15%										
	7 – 5	18.00 mOhm ± 15%										
	8 – 7	10.20 mOhm ± 15%										
Voltage ratio test. I/P 3-4, 20KHz, 1Vrms	2 – 1	0.152-0.162 Vrms	0.158	0.157	0.158	0.157	0.157					
	7 – 5	0.069-0.078 Vrms	0.074	0.074	0.074	0.074	0.074					
	8 – 7	0.023-0.032 Vrms	0.028	0.028	0.028	0.028	0.028					
Impulse test Apply DC 1200V	3 – 4	Wave from area size 15% Max. Differential area size 35% Max.							Passed Passed			
Impulse test Apply DC 1200V	2 – 4	Wave from area size 15% Max. Differential area size 35% Max.							Passed Passed			
Impulse test Apply DC 1200V	7 – 5	Wave from area size 15% Max. Differential area size 35% Max.							Passed Passed			
Impulse test Apply DC 1200V	8 – 7	Wave from area size 15% Max. Differential area size 35% Max.							Passed Passed			
Hi-Potential test. 1mA 50Hz	Apply 2000Vac between P1,B1 to S1,S2 for 2 sec.							Passed				
	Apply 1500Vac between wire to core for 2 sec.							Passed				
Phase check follow to schematic diagram.									Passed			

Mechanical test

Sample no.

	A	B	C	D	E	F
1	15.34	14.92	4	20.70	20.57	4.95
2	15.30	14.90	4	20.70	20.58	4.99
3	15.35	14.92	4	20.70	20.55	4.94
4	15.35	14.95	4	20.65	20.56	4.99
5	15.35	14.90	4	20.65	20.58	4.95

Test date : 9 September 2014

Test by : Apiwat