



Product/Process Change Notification

Initiation Date	03 Aug 2021	Notification No.	20210625
Implementation Date	03 Oct 2021	Initiator's Name	Sharon Tomo-Bustamante
Beginning Date Code of Implemented Change			WW42

CHANGE DESCRIPTION:

Knowles is making a change to the stainless steel case FK series receivers. This change is to go from a stack to stamped-folded yoke, "wet wound" coil to a thermo-bond coil, and current reed to bumped reed.

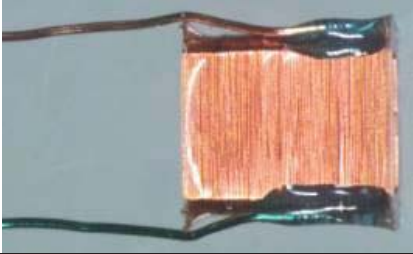
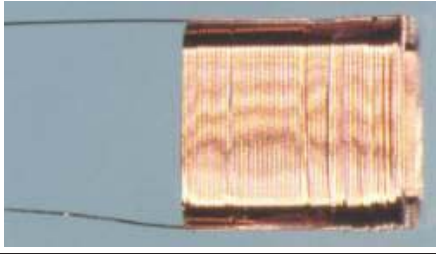
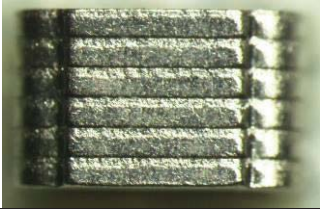

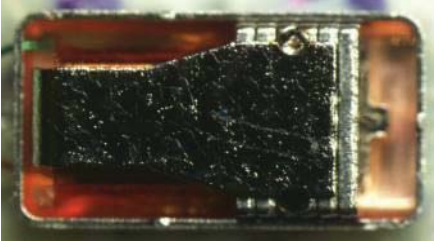
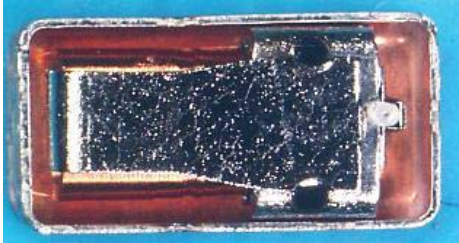
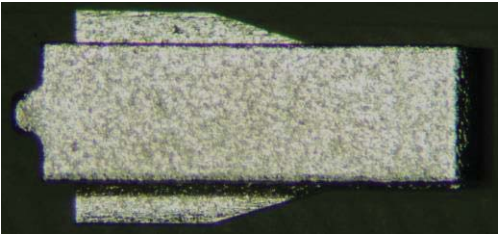

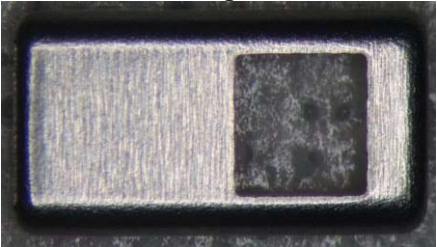
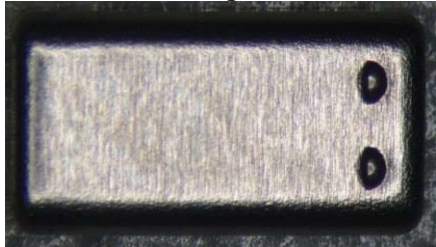
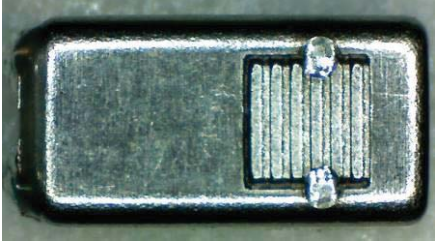

These will be alternate components to the current FK stack and coil design to increase capacity and assure adequate parts supply. These changes apply to the models shown on pages 3 to 4.

This change also requires a modification of the FK reed to be compatible within this design.

There are no significant acoustic performance or reliability changes. There is no change to the visual appearance of the receiver.

Please continue to work with your local Knowles Sales Manager if you have any questions, concerns or require samples for evaluations related to this product change notification.

FK stamped folded yoke, thermo-bond coil and bumped reed sample:

CURRENT	NEW
<p>wet wound Coil</p> 	<p>thermo-bond Coil</p> 
<p>stack</p> 	<p>stamped-folded yoke</p> 
<p>motor to cup Assembly</p> 	<p>motor to cup assembly</p> 
<p>normal reed</p> 	<p>bumped reed</p> 
<p>cup</p> 	<p>cup</p> 
<p>current cup design and weld point location</p> 	<p>new current cup design and weld point location</p> 

MODEL AFFECTED:

Below part numbers are covered with this PCN.

17198000	GK-61563-B81	QWFK-61737-000	TC-61426-000
DFK-33765-000	GK-61563-B98	QWFK-61833-000	TC-61427-000
DFK-33765-P183	GK-61673-000	QWFK-61848-000	TC-61428-000
DFK-61504-000	GV-32830-000	QWFK-61993-000	TC-61429-000
DFK-62035-000	GV-33474-000	QWFK-62286-000	TC-61430-000
DFK-62305-000	GV-33600-000	RDK-61828-P183	TC-61431-000
DFK-62305-000-VAM	GV-33923-000	RI-01-101	TC-61432-000
DFK-62305-P183	GV-61666-000	RI-01-102	TC-61433-000
DFK-62546-000	GV-61797-P74	RI-01-103	TC-61531-000
DFK-62549-000	GV-61808-000	RI-01-104	TC-61532-000
DFK-62549-P183	GX-60732-000	RI-01-151	TC-61533-000
FK-30018-000	GX-60732-B81	RI-01-152	TC-61534-000
FK-30715-000	GX-61756-000	RI-01-153	TC-61595-000
FK-30817-000	HK-61021-000	RI-01-154	TC-61668-001
FK-31130-000	HK-61021-B81	RVA-90116-N01	TC-61668-002
FK-32628-000	HK-61497-B81	RVA-90116-N02	TC-61669-001
FK-61741-000	HK-61732-B81	RVA-90116-N03	TC-61669-002
GI-60320-000	HK-61940-000	RVA-90116-N04	TC-61803-000
GK-31732-000	HK-61940-B81	RVA-90116-N05	TC-61938-000
GK-31732-G38	HL-61188-000	RVA-90116-N06	TC-61939-000
GK-33211-000	HL-61188-EXP	RVA-90116-N07	TC-62038-000
GK-33578-000	HL-61498-B81	RVA-90116-N08	TC-62039-000
GK-60301-000	HL-61564-B81	RVA-90116-N09	TC-62158-000
GK-60413-000	HL-61733-B81	RVA-90116-N10	TC-62159-000
GK-60413-000-REVC	HL-61733-B81-REVB	RVA-90277-N01	TC-62161-000
GK-60413-B81	QFK-62547-000	RVA-90340-N06	TC-62162-000
GK-61029-000	QFK-62547-P90	RVA-90341-N06	TC-62218-002
GK-61029-B81	QWFK-34209-000	RVA-90342-N06	TC-62219-002
GK-61153-000	QWFK-34209-P189	TC-32278-B100	TC-62240-000
GK-61175-B98	QWFK-60682-000	TC-32282-B100	TC-62241-000
GK-61368-000	QWFK-60682-000-VAM	TC-33040-B128	TC-62242-000
GK-61453-000	QWFK-61155-000	TC-33040-B130	TC-62243-000
GK-61453-B81	QWFK-61236-000	TC-33266-000	TC-62329-000
GK-61453-B98	QWFK-61236-EXP	TC-61232-000	TC-62342-002
GK-61453-P186	QWFK-61465-000	TC-61233-000	TC-62343-002
GK-61500-B98	QWFK-61505-000	TC-61234-000	TC-62352-000
GK-61552-000	QWFK-61505-P186	TC-61235-000	TC-62353-000

TC-62355-000
TC-62356-000
TC-62668-001
TC-62668-002
TC-62669-001
TC-62669-002
TC-7086-000
TC-7086-A90
TC-7112-000
TC-7112-A90
TC-7121-B10
TC-7121-B11
TC-7122-B08
TC-7124-000
TC-7152-000
TC-7152-E47
TC-7162-000
TC-7172-000
TC-7178-000
TWFK-30017-000
TWFK-30017-000-VAM
TWFK-30017-000-WW
TWFK-30017-P180
TWFK-30017-P183
TWFK-30017-P218
TWFK-31082-B35
TWFK-31082-B41
TWFK-31082-B82
TWFK-31082-P173
TWFK-31082-P46
TWFK-31129-000
TWFK-31129-000-VAM
TWFK-31129-P40
TWFK-31684-000
TWFK-31749-000
TWFK-32483-000
TWFK-32483-P46
TWFK-32484-000

TWFK-32484-P46
TWFK-32490-P46
TWFK-32567-P46
TWFK-32582-P173
TWFK-32582-P46
TWFK-32651-P176
TWFK-32689-000
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TWFK-33530-000
TWFK-33530-P183
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TWFK-33698-B82
TWFK-34255-000
TWFK-60526-000
TWFK-60526-000-VAM
TWFK-61366-000
TWFK-61488-000
TWFK-61488-P185
TWFK-61547-000
TWFK-61547-B35
TWFK-61616-000
TWFK-61620-000
TWFK-61641-000
TWFK-61688-P73
TWFK-61735-000
TWFK-61805-000
TWFK-61815-000
TWFK-61832-000
TWFK-62193-P189
TWFK-62200-000
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TWFK-62285-P189
TWFK-62287-000

SUPPORTING INFORMATION:

The following qualification testing has been performed and shows no significant change in the performance.

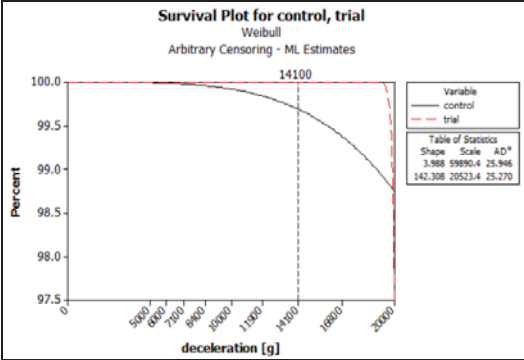
Group Identification:

Control (Current): stack and wet-wound coil,

Trial (New): stamped-folded yoke, thermobond coil and bumped reed

Knowles Qualification Plan Number: R-P-21004

Test	Acceptance Criteria	Model Tested	Sample Size	Result	
Acoustical Characteristics	Performance to be comparable to current product	FK-31818-000	Preliminary Quantity: N (trial)=94pcs N (control)= 100pcs	All parameters met the 1.33 CpK requirements	
FK-31818-000					
	SetUp_Parameter		Cpk	Average	Std Dev
	RELENS@200Hz	Trial	2.34	1.82	0.19
		Control	3.11	2.02	0.16
	RELENS@500Hz	Trial	6.10	1.17	0.09
		Control	6.56	1.28	0.09
	SENSITIVITY@1000Hz	Trial	2.22	94.50	0.23
		Control	2.42	94.63	0.22
	PKREL1Amp	Trial	2.95	6.89	0.33
		Control	3.41	6.59	0.25
	PKREL1Freq	Trial	3.74	2865.87	32.61
		Control	3.05	2917.76	45.66
	VLREL1Amp	Trial	1.49	-8.99	0.45
		Control	2.12	7.86	0.49
	VLREL1Freq	Trial	1.96	5275.74	63.67
		Control	3.37	5175.36	47.05
	PKREL2Amp	Trial	1.00	-6.85	1.04
		Control	2.80	-4.93	0.59
	PKREL2Freq	Trial	1.59	6265.70	91.19
		Control	2.39	6213.76	67.83
	THD1	Trial	5.46	0.90	0.22
		Control	6.49	0.74	0.19
	THD2	Trial	1.78	1.55	0.55
		Control	2.83	0.91	0.42
	THD3	Trial	3.44	1.80	0.70
		Control	3.80	1.78	0.63
	THD4	Trial	3.26	0.95	0.36
		Control	4.51	0.66	0.28
	THD5	Trial	3.02	1.08	0.38
		Control	4.32	0.85	0.28
	THD6	Trial	2.49	1.21	0.44
		Control	3.72	0.79	0.33
	IMPEDANCE1	Trial	4.34	238.35	2.36
		Control	4.34	234.55	2.65
	IMPEDANCE2	Trial	2.92	305.58	4.51
		Control	2.68	304.28	4.75

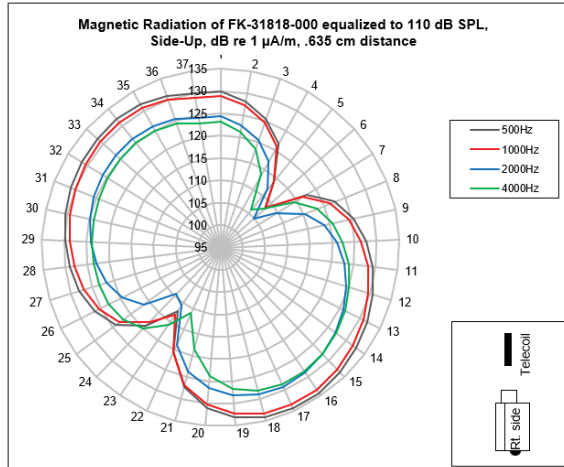
Test	Acceptance Criteria	Model Tested	Sample Size	Result
HALT Condition A: 63°C / 95% RH, 1008 hours total exposure, biased.	Units shall compare favourably to historical data from similar model and shall change ≤ 3.0 dB change in sensitivity at the adjust frequency; $\leq 5\%$ distortion changes at the nominal drive ; $\leq 10\%$ distortion changes at the high drive.	FK-31818-000	Trial = 30 Control = 30	Passed
	<u>Average Change of Sensitivity (dB) @ 1 kHz</u> Trial = -0.144 Control = -0.086			
Composite Temperature Humidity Cyclic Test Test 2b (10 cycles of 24 hrs each) 25°C / 80-100% RH for 3 h 65°C / 90-100% RH for 5 h - 10°C / 0% RH for 5 h	Sensitivity changes at the adjustment frequency < 1.5 dB(FF model 3dB)	FK-31818-000	Trial = 20 Control = 20	Passed
	<u>Average Change of Sensitivity (dB) @ 1 kHz</u> Trial = -0.264 Control = -0.423			
Aggressive Sweat Cond 4 -10 Day exposure to sweat vapor in 38°C oven (7 conditions to choose from. Normally condition 4 is used 1.8PH \pm .2.)	No visual signs of corrosion, Sensitivity to change < 4 dB	FK-31818-000	Trial = 20 Control = 20	Passed
	<u>Average Change of Sensitivity (dB) @ 1 kHz</u> Trial = -0.104 Control = -0.285			
Mechanical Shock Shock at progressively higher heights until failure. "Failure" means that a unit changes >3dB from initial, THD at nominal drive at 1/3 resonance > 10% or THD at nominal drive at 1/2 resonance > 20%.	90% Survivability @14.1kG	FK-31818-000	Trial = 80 Control = 80	Passed
	Estimate only (combined):  Trial = above 90% survivability @14.1 kG Control = above 90% survivability @14.1 kG			

Test	Acceptance Criteria	Model Tested	Sample Size	Result
Powered Salt Fog Test 4 Weeks exposure to 35°C salt fog chamber with salt deposition 20~50g/sq.m/24 hours. Units powered with 0.289Vrms@1kHz	Comparable to similar coils.	FK-31818-000	Trial = 20 Control = 20	Passed
	Trial = Passed Control = Passed			
Thermal shock test 5 cycles: -40°C to +63°C, 15 minute soaks, <30 sec. transition	≤3 dB change from initial adjust frequency value	FK-31818-000	Trial = 20 Control = 20	Passed
	<u>Average Change of Sensitivity (dB) @ 1 kHz</u> Trial = 0.0785 dB Control = 0.0215 dB			

Magnetic Radiation	Acceptance Criteria	Model Tested	Sample Size	Result
Magnetic Radiation	Comparable to current FK assembly	FK-31818-000	10 each	Passed
COVER UP (Equalized to 110 dB SPL)		COVER UP (Equalized to 110 dB SPL)		
Current		New		

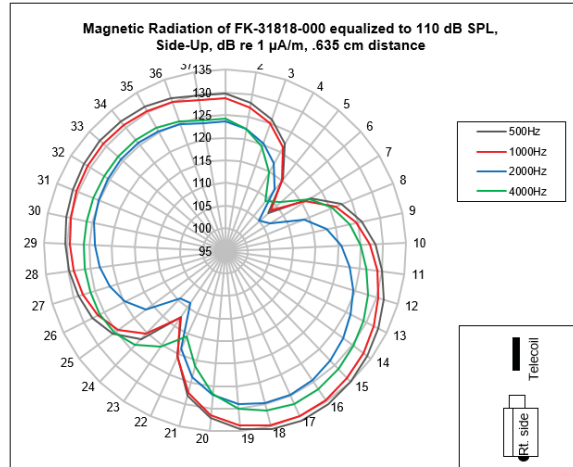
SIDE UP (Equalized to 110 dB SPL)

Current



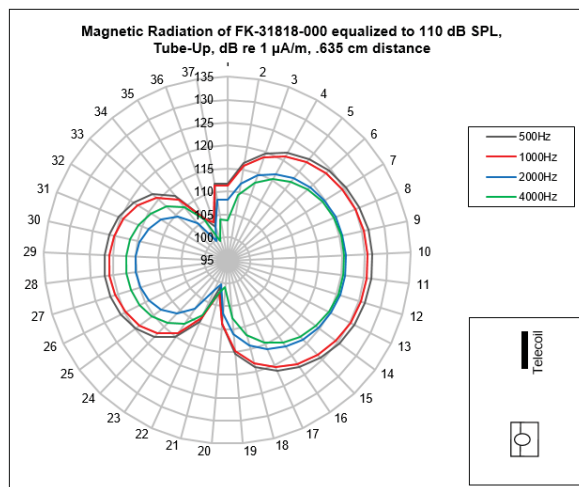
SIDE UP (Equalized to 110 dB SPL)

New



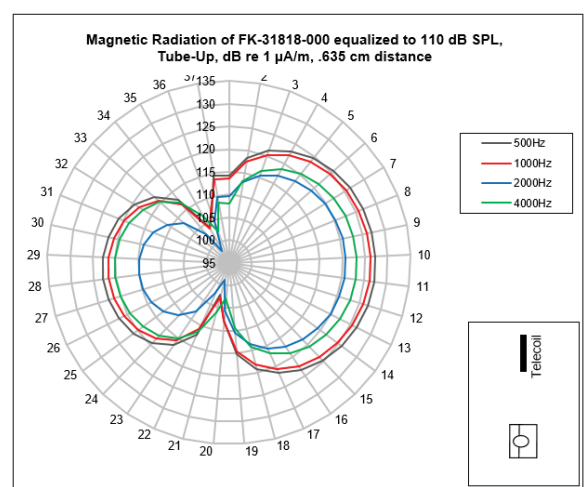
TUBE UP (Equalized to 110 dB SPL)

Current



TUBE UP (Equalized to 110 dB SPL)

New



Conclusion:

There is no significant change to the magnetic radiation of this receiver.

Since the case for this receiver is Stainless Steel, MagRad leakage is not considered critical for this model.

Please continue to work with your local Knowles Sales Manager if you have any questions, concerns or require samples for evaluations related to this product change notification.