

TCA/DIGIKEY

2-Jul-12

Piezo & Protection Devices Business Group  
TDK-EPC Corporation

## Application for Process Change

QA Manager :E.Takahashi

Technical Manager :H.Tosaka

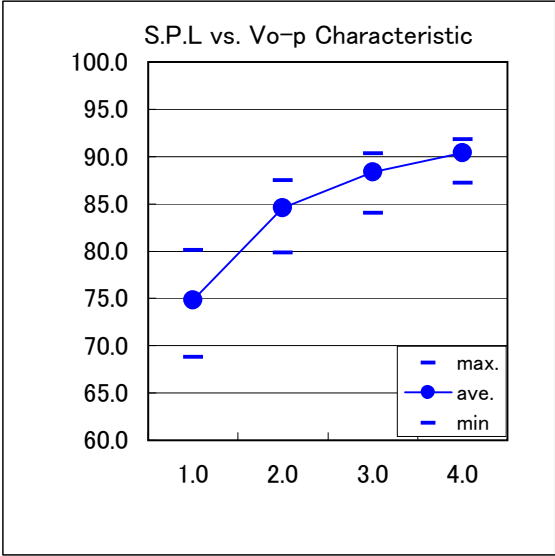
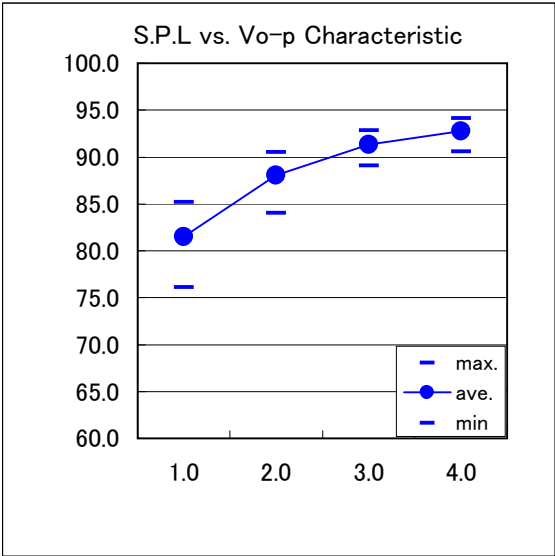
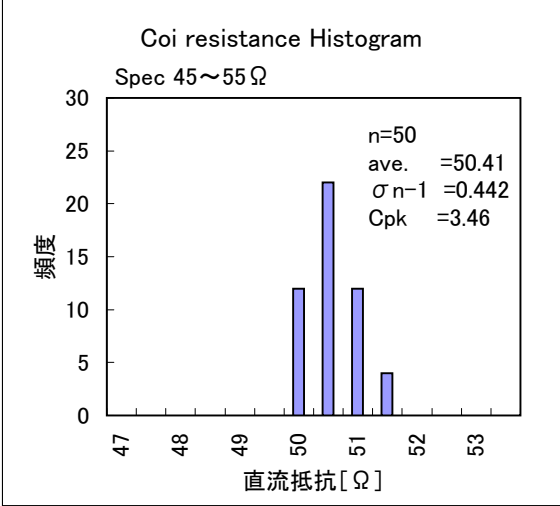
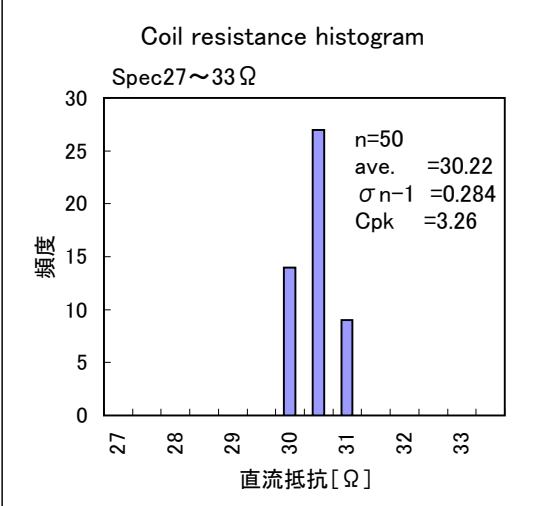
Contact Person in Charge :T.sato

We hereby apply for process change as follows.  
Accordingly, you are kindly requested to study and reply in the following reply form.  
In case of no reply, please note that we take liberty to understand that the request has been accepted.

TELNo.0184-35-5345  
FAXNo.0184-35-5089

Subject	Coil resistance change of SD1209T3-A1		
Your Item #	SD1209T3-A1	TDK Item #	SD1209T3-A1
Items to Be Changed			
Before Change	After Change	Special Notes	
<p>●Coil resistance : 50Ω±10%</p>	<p>●Coil resistance : 30Ω±10%</p>	<p>When changing the current resistance , we only change the winding numbers of the coils. There be no other changes except that. The attachment 1. The comparison of electrical characteristic before and after the change. 2.The test result of high temperature &amp;high humidity after the change</p>	
Reason for Change			
<p>To improve the characteristic of sound pressure vs. operate voltage and to improve the inconsistency of the sound pressure at rate voltage of 3Vo-p, we operate the change.</p>			
Schedule date for implementation: Shipment to be made in October, 2012		Requested reply date: Aug 31,2012	Attached Material(s): <input checked="" type="radio"/> Yes <input type="radio"/> No
<p>TDK—EPC Corporation Attn: Piezo &amp; Protection Devices Business Group</p>			
Date of entry:		<p><u>Name of PIC:</u> <u>Name of Contact PIC:</u> <u>Dept.:</u></p>	
Column for Approval		Instruction(s)	

# The comparison of electrical characteristic before and after the change.

Item	Before change	After change																																																										
S.P.L vs. Vo-p Characteristic	<p>at.2048Hz duty50% squre wave n=30</p> <table border="1" data-bbox="280 405 850 600"> <thead> <tr> <th rowspan="2">[Vo-p]</th> <th colspan="4">S.P.L[dB(A)/10cm]</th> </tr> <tr> <th>1.0</th> <th>2.0</th> <th>3.0</th> <th>4.0</th> </tr> </thead> <tbody> <tr> <td>max.</td> <td>80.1</td> <td>87.5</td> <td>90.3</td> <td>91.8</td> </tr> <tr> <td>ave.</td> <td>74.85</td> <td>84.54</td> <td>88.34</td> <td>90.38</td> </tr> <tr> <td>min</td> <td>68.8</td> <td>79.8</td> <td>84.0</td> <td>87.2</td> </tr> <tr> <td><math>\sigma</math>n-1</td> <td>3.576</td> <td>2.200</td> <td>1.358</td> <td>0.947</td> </tr> </tbody> </table> 	[Vo-p]	S.P.L[dB(A)/10cm]				1.0	2.0	3.0	4.0	max.	80.1	87.5	90.3	91.8	ave.	74.85	84.54	88.34	90.38	min	68.8	79.8	84.0	87.2	$\sigma$ n-1	3.576	2.200	1.358	0.947	<p>at.2048Hz duty50% squre wave n=30</p> <table border="1" data-bbox="898 405 1468 600"> <thead> <tr> <th rowspan="2">[Vo-p]</th> <th colspan="4">S.P.L[dB(A)/10cm]</th> </tr> <tr> <th>1.0</th> <th>2.0</th> <th>3.0</th> <th>4.0</th> </tr> </thead> <tbody> <tr> <td>max.</td> <td>85.2</td> <td>90.5</td> <td>92.8</td> <td>94.1</td> </tr> <tr> <td>ave.</td> <td>81.50</td> <td>88.09</td> <td>91.36</td> <td>92.74</td> </tr> <tr> <td>min</td> <td>76.1</td> <td>84.0</td> <td>89.1</td> <td>90.6</td> </tr> <tr> <td><math>\sigma</math>n-1</td> <td>2.698</td> <td>1.572</td> <td>0.937</td> <td>0.797</td> </tr> </tbody> </table> 	[Vo-p]	S.P.L[dB(A)/10cm]				1.0	2.0	3.0	4.0	max.	85.2	90.5	92.8	94.1	ave.	81.50	88.09	91.36	92.74	min	76.1	84.0	89.1	90.6	$\sigma$ n-1	2.698	1.572	0.937	0.797
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2012/2/15

# RELIABILITY TEST REPORT

TDK-EPC CORPORATION  
 2nd Acuator Sec.  
 Piezo Material Products Grp.  
 P & P Device B.Grp

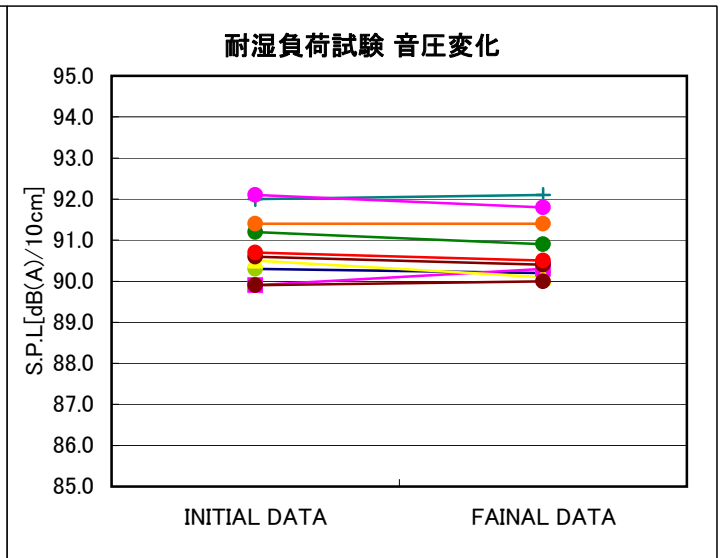
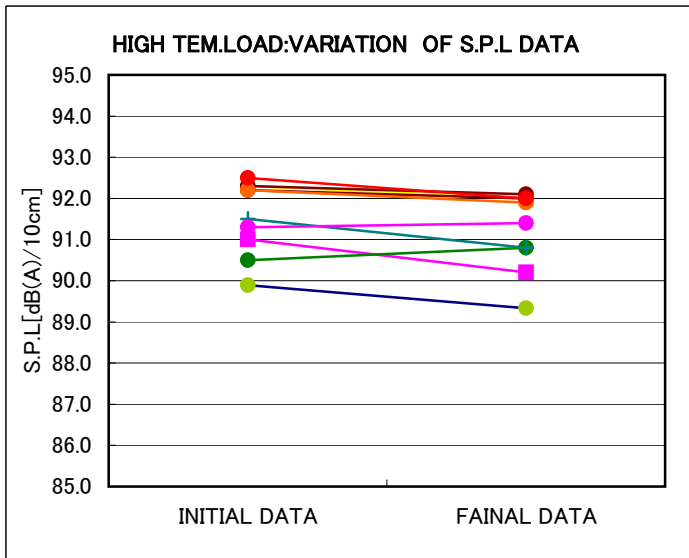
PART NUMBER : ERECTROMAGNETIC BUZZER SD1209T3-A1

Purpose: In order to improve the voltage characteristic and up the sound level, we evaluated the samples that direct current resistance will be changed.

The direct current resistance(operating current) that being changed have been done in other type products. We do the high temperature&high humidity test to check if it have any other problems.

Result: There being no abnomy in the sound pressure and appearance in the products after the test.

No	ITEM	TEST CONDITIONS	QT.	RESULTS	MARK
1	HIGH TEMPERATURE LOAD	85°C, 4Vo-p 1000hours	10	OK	
2	HUMIDITY LOAD	60°C, 90~95%RH 4Vo-p 1000hours	10	OK	



試験前 試験後

TEST REPORT

PART No.	SD1614TT-A6M						TESTED BY	A.Sato			
QUANTITY	10pcs						CHECKED BY	T.Sato			
DATE	START: 2011/12/21	TEMP.& HUM.		25°C 41%							
	FINISH: 2012/2/12	TEMP.& HUM.		25°C 52%							
ITEM	10.HIGH TEMPEATURE LOAD										
	INITIAL DATA			FINAL DATA			VARIATIONS OF DATA			APPEARANCE	RESULTS
CHARACTERISTICS	P2048		RDC	P2048		RDC	P2048		RDC		
UNITS	(dB)		(Ω)	(dB)		(Ω)	(dB)		(%)		
MAX.LIMITS	-		33	-		-	5		-		
MIN.LIMITS	80		27	-		-	-5		-		
SAMPLE No.1	89.9		30.0	89.3		30.1	-0.6		0.3	OK	OK
2	91.0		30.0	90.2		30.1	-0.8		0.3	OK	OK
3	92.3		30.6	92.0		30.8	-0.3		0.7	OK	OK
4	90.5		29.7	90.8		30.0	0.3		1.0	OK	OK
5	92.2		30.0	92.0		30.2	-0.2		0.7	OK	OK
6	92.3		29.9	92.1		30.0	-0.2		0.3	OK	OK
7	91.5		30.0	90.8		30.2	-0.7		0.7	OK	OK
8	92.2		30.3	91.9		30.3	-0.3		0.0	OK	OK
9	91.3		30.8	91.4		30.9	0.1		0.3	OK	OK
10	92.5		30.0	92.0		30.1	-0.5		0.3	OK	OK
AVE.	91.57		30.13	91.3		30.27	-0.32		0.47		
MAX.	92.5		30.8	92.1		30.9	0.3		1.0		
MIN.	89.9		29.7	89.3		30.0	-0.8		0.0		
RELIABILITY TEST CONDITIONS						MEASUREMENT CONDITIONS					
+85°C 4Vo-p 1000hours						INPUT VOLTAGE :3Volt ,Square wave 50% duty cycles					
						FEQUENCY : 2048Hz					
						SPL : at. 10cm from source & A weighting					
MEASURE						MARK P2048 : SPL at 2048Hz					
SPL METER :RION NA20											

TEST REPORT

PART No.	SD1614TT-A6M					TESTED BY		A.Sato			
QUANTITY	10pcs					CHECKED BY		T.Sato			
DATE	START: 2003/4/21		TEMP.& HUM.	20°C 52%							
	FINISH: 2003/6/20		TEMP.& HUM.	25°C 51%							
ITEM	11.HUMIDITY LOAD										
	INITIAL DATA			FINAL DATA			VARIATIONS OF DATA			APPEAR -ANCE	RESULTS
CHARACTERISTICS	P2048		RDC	P2048		RDC	P2048		RDC		
UNITS	(dB)		(Ω)	(dB)		(Ω)	(dB)		(%)		
MAX.LIMITS	-		33	-		-	5		-		
MIN.LIMITS	80		27	-		-	-5		-		
SAMPLE No.1	90.3		30.4	90.2		30.5	-0.1		0.3		
2	89.9		29.8	90.3		29.9	0.4		0.3	OK	OK
3	90.5		29.9	90.1		29.9	-0.4		0.0	OK	OK
4	91.2		30.5	90.9		30.6	-0.3		0.3	OK	OK
5	90.6		29.9	90.4		30.0	-0.2		0.3	OK	OK
6	89.9		30.2	90.0		30.3	0.1		0.3	OK	OK
7	92.0		30.0	92.1		30.1	0.1		0.3	OK	OK
8	91.4		30.4	91.4		30.4	0.0		0.0	OK	OK
9	92.1		30.3	91.8		30.5	-0.3		0.7	OK	OK
10	90.7		30.1	90.5		30.3	-0.2		0.7	OK	OK
AVE.	90.86		30.15	90.8		30.25	-0.09		0.33		
MAX.	92.1		30.5	92.1		30.6	0.4		0.7		
MIN.	89.9		29.8	90.0		29.9	-0.4		0.0		
RELIABILITY TEST CONDITIONS						MEASUREMENT CONDITIONS					
60°C 90~95%RH 4Vo-p 1000hours						INPUT VOLTAGE :3Volt ,Square wave 50% duty cycles					
						FEQUENCY : 2048Hz					
						SPL : at. 10cm from source & A weighting					
MEASURE						MARK P2048 : SPL at 2048Hz					
SPL METER :RION NA20											