

認可書

客戶名稱：升力科技(SHENG LEE TECHNOLOGIES LTD.)

零件名稱：TL431K-T92-K

零件編號：149D00300020120

零件廠牌：UNISONIC TECHNOLOGIES CO., LTD.

認可日期：2014.02.12

認可章	簽 認	
	認可	
	校對	
	設計	

廠商簽認	製作
晶偉電子股份有限公司 COMMOTECH ELECTRONICS CORPORATION 台北市忠孝東路4段560號10樓 TEL:2758-9669 FAX:27589668	林鉅庭 分機175 0953113168

晶偉電子股份有限公司 Commotech Electronics Corporation

台北市忠孝東路四段560號10F

統一編號：12188401

TEL: 886-2-27589669

FAX: 886-2-27589668

產品介紹：

HITACHI：SEMICONDUCTOR(DRAM, SRAM..) ※大量庫存，規格齊全 ※ 價格廉宜，長期供應 ※
COLOR DISPLAY TUBE ※ 專業經營，技術協助 ※ 品質保證，信譽卓著 ※
LCD MODULE ※ 缺料調貨，服務最快 ※ 代開 L/C，收費低廉 ※

現貨經銷：

IC
LED
TRANSISTOR
DIODE
TANTALUM CAP



TL431

LINEAR INTEGRATED CIRCUIT

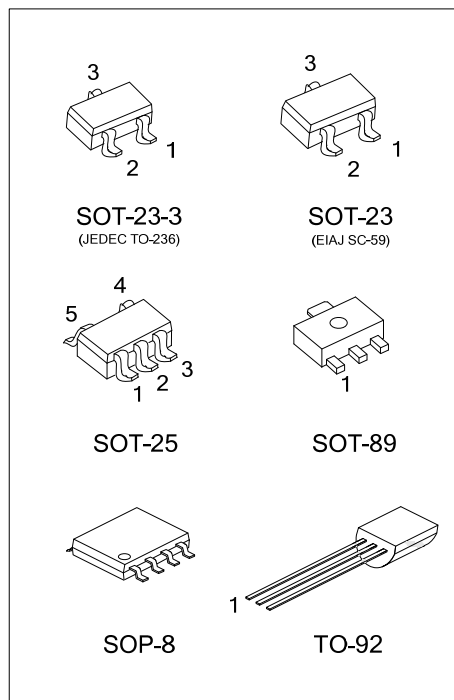
PROGRAMMABLE PRECISION REFERENCE

DESCRIPTION

The UTC **TL431** is a three-terminal adjustable regulator with a guaranteed thermal stability over applicable temperature ranges. The output voltage may be set to any value between V_{REF} (approximately 2.5V) and 36V with two external resistors. It provides very wide applications, including shunt regulator, series regulator, switching regulator, voltage reference and others.

FEATURES

- * Programmable output Voltage to 36V.
- * Low dynamic output impedance 0.2Ω.
- * Sink current capability of 1.0 to 100mA.
- * Equivalent full-range temperature coefficient of 50ppm/ °C typical for operation over full rated operating temperature range.



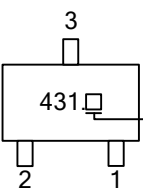
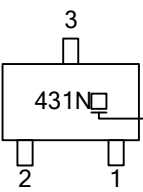
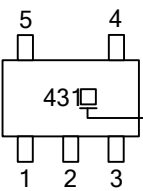
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
TL431K-AB3-R	TL431G-AB3-R	SOT-89	R	A	K	-	-	-	-	-	Tape Reel
TL431K-AE2-R	TL431G-AE2-R	SOT-23-3	K	R	A	-	-	-	-	-	Tape Reel
TL431K-AE3-R	TL431G-AE3-R	SOT-23	K	R	A	-	-	-	-	-	Tape Reel
TL431NSL-AE3-R	TL431NSG-AE3-R	SOT-23	R	K	A	-	-	-	-	-	Tape Reel
TL431NSL-AE2-R	TL431NSG-AE2-R	SOT-23-3	R	K	A	-	-	-	-	-	Tape Reel
TL431K-AF5-R	TL431G-AF5-R	SOT-25	X	X	K	R	A	-	-	-	Tape Reel
TL431K-S08-R	TL431G-S08-R	SOP-8	K	A	A	X	X	A	A	R	Tape Reel
TL431K-S08-T	TL431G-S08-T	SOP-8	K	A	A	X	X	A	A	R	Tube
TL431K-T92-B	TL431G-T92-B	TO-92	R	A	K	-	-	-	-	-	Tape Box
TL431K-T92-K	TL431G-T92-K	TO-92	R	A	K	-	-	-	-	-	Bulk
TL431K-T92-R	TL431G-T92-R	TO-92	R	A	K	-	-	-	-	-	Tape Reel

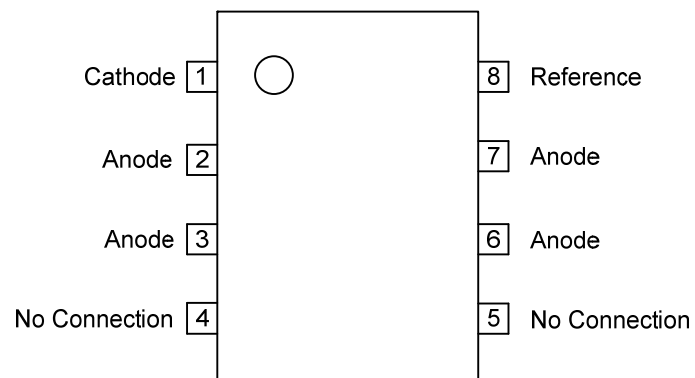
Note: Pin Code: K: Cathode A: Anode R: Reference X: No Connection

<p>TL431K-AB3-R</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Lead Free</p>		<p>(1) B: Tape Box, K: Bulk, R: Tape Reel, T: Tube</p> <p>(2) AB3: SOT-89, AE2: SOT-23-3, AE3: SOT-23, AF5: SOT-25, S08: SOP-8, T92: TO-92</p> <p>(3) G: Halogen Free, K: Lead Free</p> <p>G: Halogen Free, L: Lead Free Only for TL431NS Type</p>
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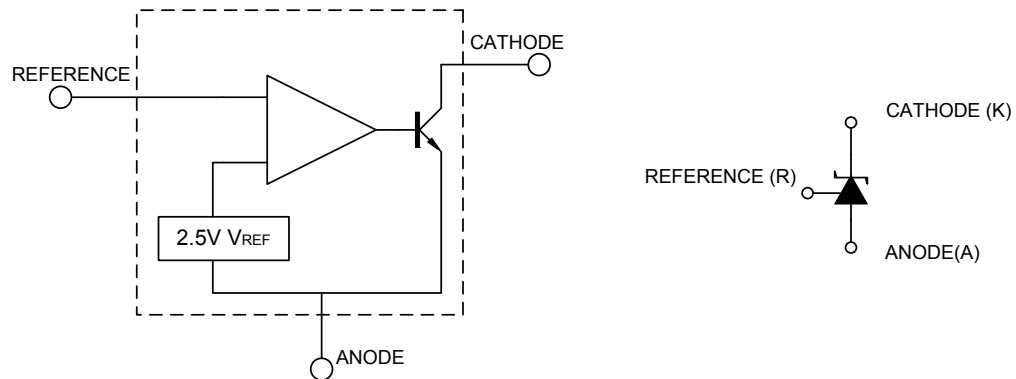
MARKING

PACKAGE	MARKING
SOT-23-3 SOT-23	 <p>431 □ → K: Lead Free G: Halogen Free</p>
SOT-23-3 SOT-23 (TL431NS)	 <p>431N □ → L: Lead Free G: Halogen Free</p>
SOT-25	 <p>431 □ → K: Lead Free G: Halogen Free</p>

PIN CONFIGURATION(For SOP-8)



■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS (Operating temperature range applies, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Cathode Voltage	V_{KA}	37	V
Cathode Current Range(Continuous)	I_{KA}	-100 ~ +150	mA
Reference Input Current Range	I_{REF}	-0.05 ~ +10	mA
Power Dissipation	TO-92	770	mW
	SOT-89	800	mW
	SOT-23/SOT-23-3/SOT-25	300	mW
	SOP-8	600	mW
Operating Junction	T_J	+150	°C
Operating Ambient	T_{OPR}	-40 ~ +85	°C
Storage Temperature	T_{STG}	-65 ~ +150	°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged
Absolute maximum ratings are stress ratings only and functional device operation is not implied.

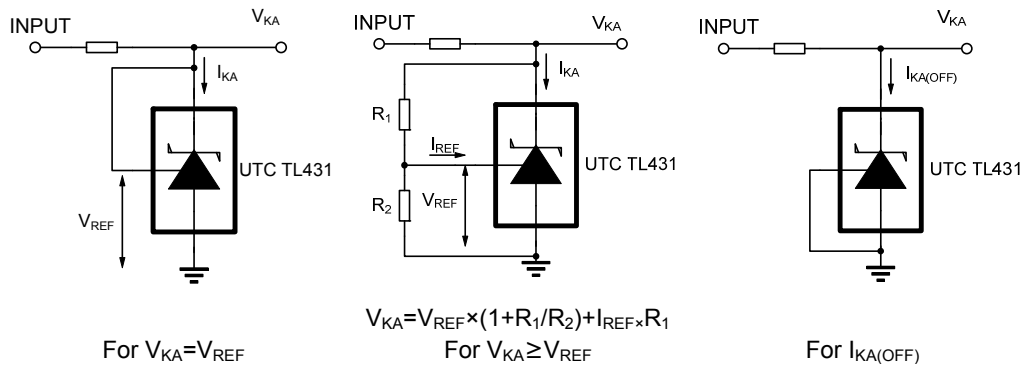
■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Cathode Voltage	V_{KA}	V_{REF}		36	V
Cathode Current	I_{KA}	1		100	mA

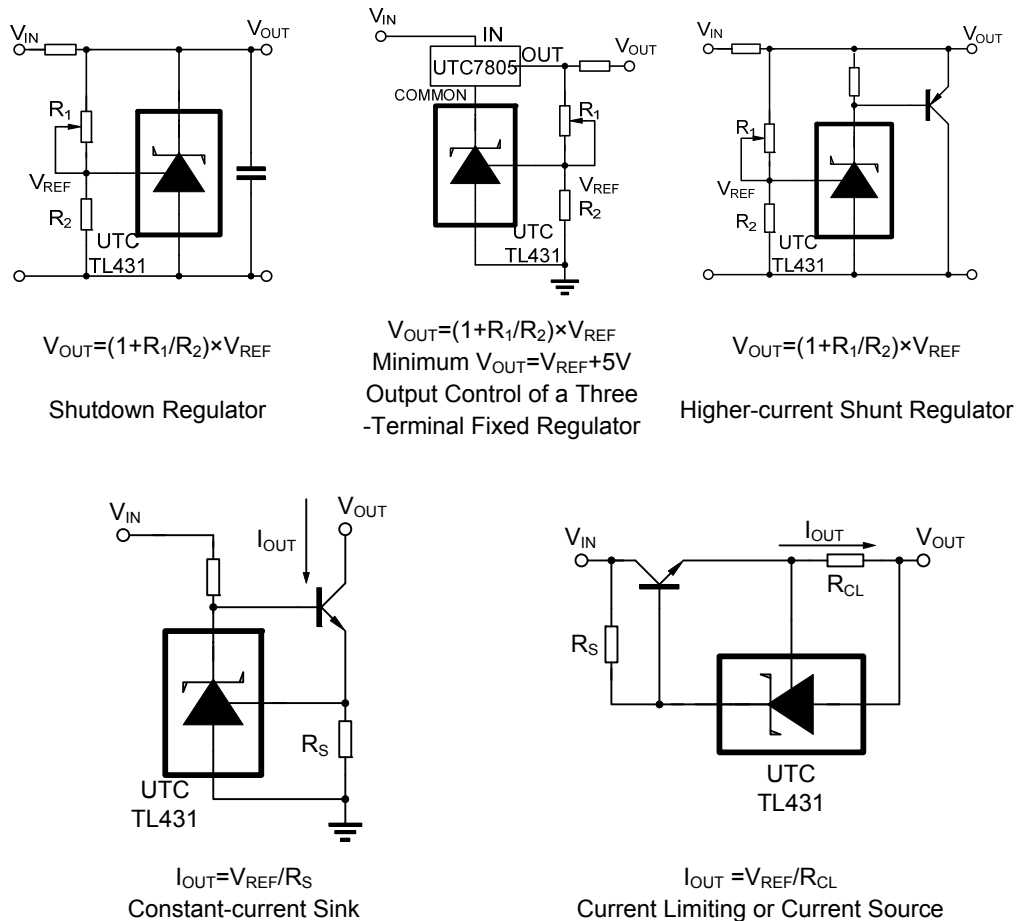
■ ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$, unless otherwise specified.)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Reference Input Voltage	V _{REF}	V _{KA} =V _{REF} , I _{KA} =10mA	TL431-A	2.483	2.495	2.507	V
			TL431-1	2.470	2.495	2.520	V
			TL431-2	2.520	-	2.545	V
			TL431-3	2.445	-	2.470	V
Deviation of reference Input Voltage Over temperature	$\frac{\Delta V_{REF}}{\Delta T}$	V _{KA} =V _{REF} , I _{KA} =10mA, 0°C ≤ T _A ≤ 70°C			4.5	17	mV
Ratio of Change in Reference Input Voltage to the Change in Cathode Voltage	$\frac{\Delta V_{REF}}{\Delta V_{KA}}$	I _{KA} =10mA	ΔV _{KA} =10V~V _{REF}		-1.0	-2.7	mV/V
			ΔV _{KA} =36V~10V		-0.5	-2.0	mV/V
Reference Input Current	I _{REF}	I _{KA} =10mA, R1=10kΩ, R2=∞			1.5	4	μA
Deviation of Reference Input Current Over Full Temperature Range	$\frac{\Delta I_{REF}}{\Delta T}$	I _{KA} =10mA, R1=10kΩ, R2=∞, T _A =full Temperature			0.4	1.2	μA
Minimum Cathode Current for Regulation	I _{KA(MIN)}	V _{KA} =V _{REF}			0.3	0.5	mA
Off-State Cathode Current	I _{KA(OFF)}	V _{KA} =36V, V _{REF} =0			0.05	1.0	μA
Dynamic Impedance	Z _{KA}	V _{KA} =V _{REF} , I _{KA} =1~ 100mA, f≤1.0kHz			0.15	0.5	Ω

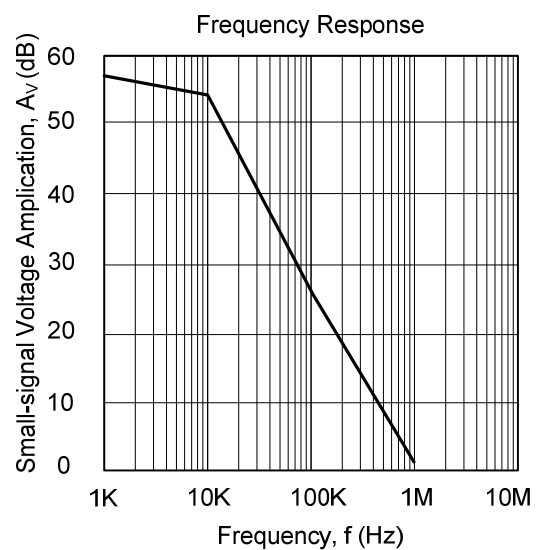
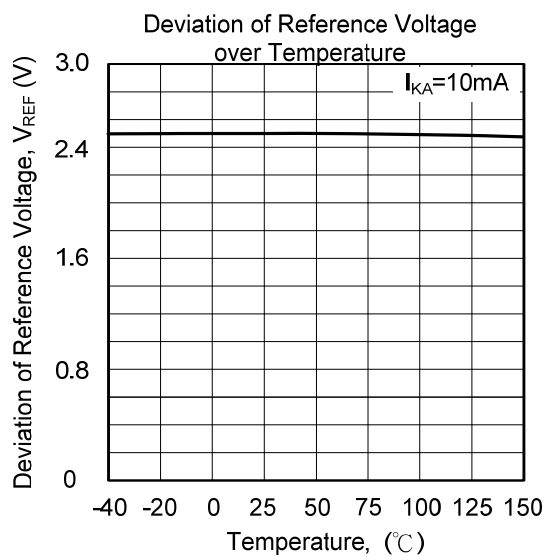
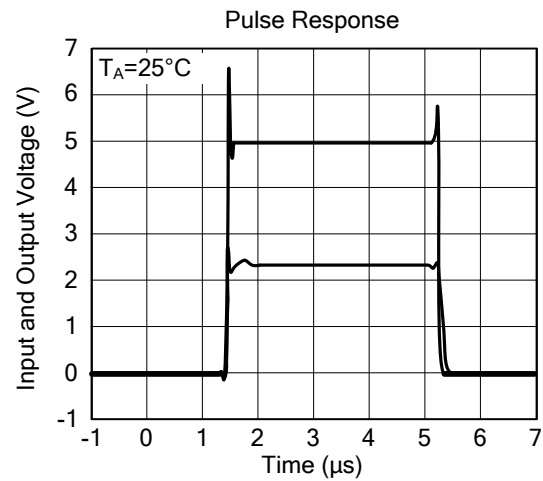
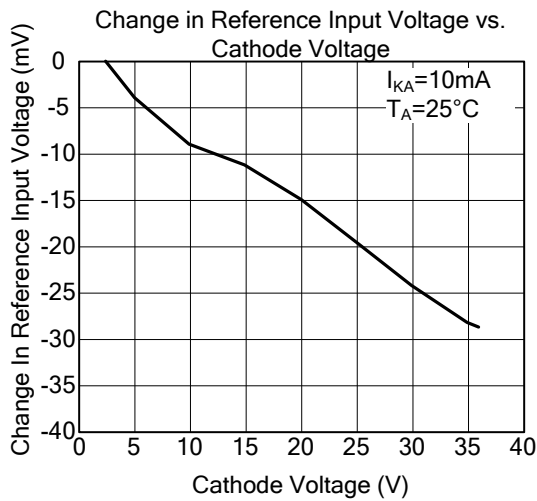
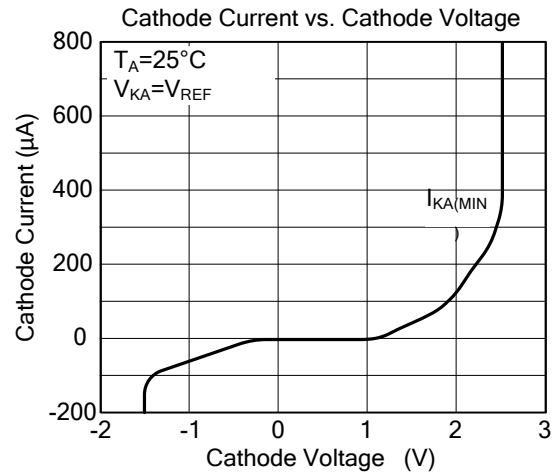
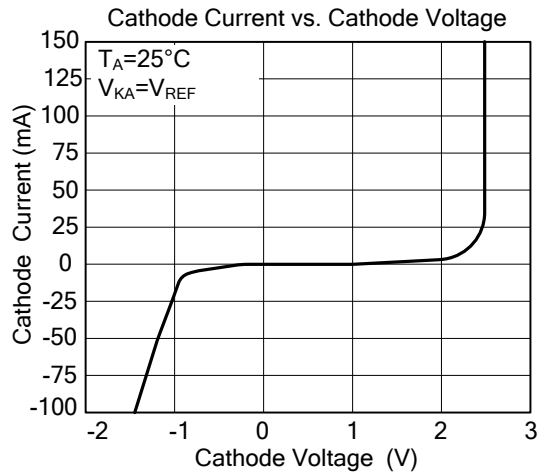
■ TEST CIRCUIT



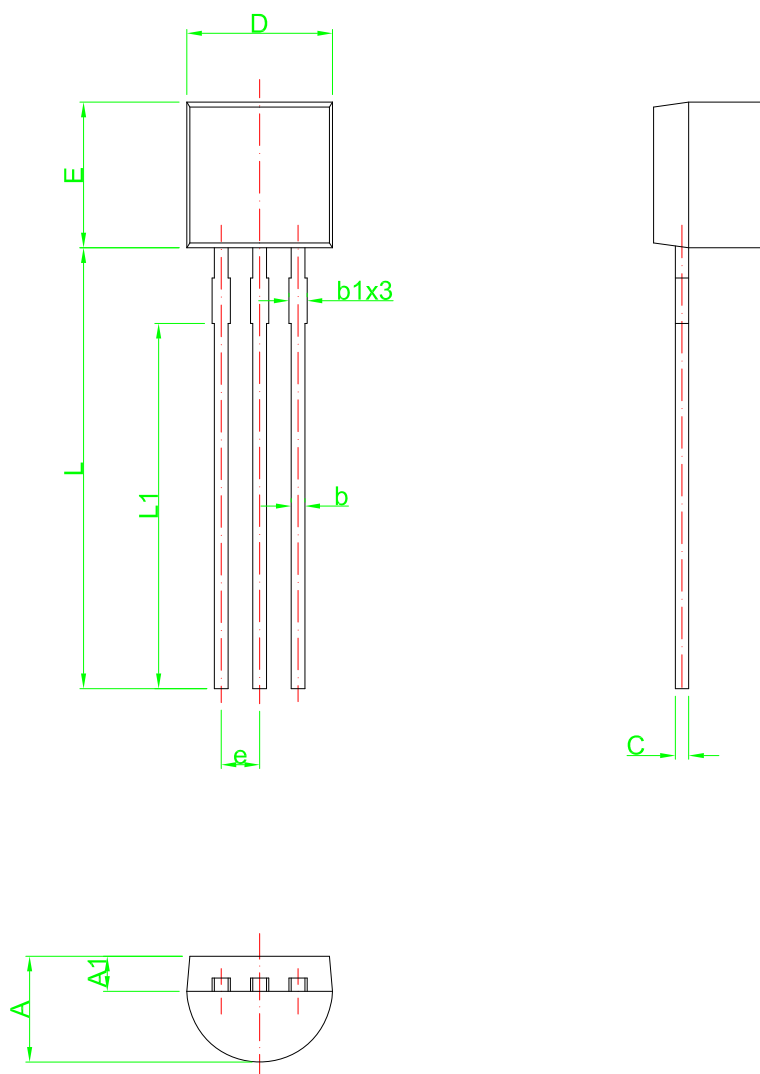
■ APPLICATION CIRCUIT



TYPICAL CHARACTERISTICS



UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice.



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	3.30	3.70	0.130	0.146
A1	1.10	1.40	0.043	0.055
b	0.34	0.55	0.013	0.022
b1	0.50	0.70	0.020	0.028
C	0.34	0.54	0.013	0.021
D	4.33	4.83	0.170	0.190
E	4.33	4.83	0.170	0.190
e	1.27 TYP		0.05 TYP	
L	14.07	14.87	0.554	0.585
L1	12.47 TYP		0.491 TYP	

Refer to JEDEC NO. TO-92



友順科技股份有限公司
UNISONIC TECHNOLOGIES CO.,LTD

正式發行圖面

SCALE	mm
4:發行	0 30
SHEET	THIRD ANGLE PROJECTION
1 of 1	JUN 01 2012
ENG.	Naomi Lin 2012/5/29
APPR.	Henry Hsiao 2012/5/29

REV: A3

PART NO:TO-92

DWG NO:DIM-TO-92-000-A3

TITLE
TO-92
Package Dimensions

測試報告 Test Report

號碼(No.) : CE/2013/82466 日期(Date) : 2013/08/22 頁數(Page) : 1 of 7

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4F-2, NO. 16, LANE 609, SEC. 5, CHUNG-HSIN RD., SAN-CHUNG DISTRICT, NEW TAIPEI CITY,
TAIWAN, R. O. C.



以下測試樣品係由申請廠商所提供及確認 (The following sample(s) was/were submitted and identified by/on behalf of the applicant as) :

送樣廠商(Sample Submitted By) : 友順科技股份有限公司 (UNISONIC TECHNOLOGIES CO., LTD.)
樣品名稱(Sample Description) : IC, DISCRETES
樣品型號(Style/Item No.) : TO-92 SERIES:TO-92, TO-92NL, TO-92SP
收件日期(Sample Receiving Date) : 2013/08/15
測試期間(Testing Period) : 2013/08/15 TO 2013/08/22

測試需求(Test Requested) : 依據客戶指定, 進行鎘, 鉛, 汞, 六價鉻, 多溴聯苯, 多溴聯苯醚測試. (As specified by client, to test Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs contents in the submitted sample.)

測試方法(Test Method) : 請見下一頁 (Please refer to next pages).

測試結果(Test Results) : 請見下一頁 (Please refer to next pages).


Troy Chang / Manager-Tech
Signed for and on behalf of
SGS TAIWAN LTD.
Chemical Laboratory – Taipei

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測試報告

Test Report

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TAIWAN, R. O. C.


測試結果(Test Results)

測試部位(PART NAME)No.1 : 本體混測 (MIXED ALL PARTS OF BODY)

測試部位(PART NAME)No.2 : 混測銀色金屬 (含鍍層) (MIXED SILVER COLORED METAL (INCLUDING THE PLATING LAYER))

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測 極限值 (MDL)	結果 (Result)	
				No.1	No.2
鎘 / Cadmium (Cd)	mg/kg	參考IEC 62321-5: 2013方法, 以感應耦合電漿原子發射光譜儀檢測. / With reference to IEC 62321-5: 2013 and performed by ICP-AES.	2	n.d.	n.d.
鉛 / Lead (Pb)	mg/kg	參考IEC 62321-5: 2013方法, 以感應耦合電漿原子發射光譜儀檢測. / With reference to IEC 62321-5: 2013 and performed by ICP-AES.	2	n.d.	8
汞 / Mercury (Hg)	mg/kg	參考IEC 62321-4: 2013方法, 以感應耦合電漿原子發射光譜儀檢測. / With reference to IEC 62321-4: 2013 and performed by ICP-AES.	2	n.d.	n.d.
六價鉻 / Hexavalent Chromium Cr(VI)	mg/kg	參考IEC 62321: 2008方法, 以UV-VIS檢測. / With reference to IEC 62321: 2008 and performed by UV-VIS.	2	n.d.	---
	**	參考IEC 62321: 2008方法, 以沸水萃取法檢測. / With reference to IEC 62321: 2008 and performed by Boiling water extraction Method.#	#	---	Negative

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4F-2, NO. 16, LANE 609, SEC. 5, CHUNG-HSIN RD., SAN-CHUNG DISTRICT, NEW TAIPEI CITY,
TAIWAN, R. O. C.

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測 極限值 (MDL)	結果 (Result)	
				No.1	No.2
多溴聯苯總和 / Sum of PBBs	mg/kg	參考IEC 62321: 2008方法, 以氣相層析 / 質譜儀檢測. / With reference to IEC 62321: 2008 and performed by GC/MS.	-	n.d.	---
一溴聯苯 / Monobromobiphenyl	mg/kg		5	n.d.	---
二溴聯苯 / Dibromobiphenyl	mg/kg		5	n.d.	---
三溴聯苯 / Tribromobiphenyl	mg/kg		5	n.d.	---
四溴聯苯 / Tetrabromobiphenyl	mg/kg		5	n.d.	---
五溴聯苯 / Pentabromobiphenyl	mg/kg		5	n.d.	---
六溴聯苯 / Hexabromobiphenyl	mg/kg		5	n.d.	---
七溴聯苯 / Heptabromobiphenyl	mg/kg		5	n.d.	---
八溴聯苯 / Octabromobiphenyl	mg/kg		5	n.d.	---
九溴聯苯 / Nonabromobiphenyl	mg/kg		5	n.d.	---
十溴聯苯 / Decabromobiphenyl	mg/kg		5	n.d.	---
多溴聯苯醚總和 / Sum of PBDEs	mg/kg		-	n.d.	---
一溴聯苯醚 / Monobromodiphenyl ether	mg/kg		5	n.d.	---
二溴聯苯醚 / Dibromodiphenyl ether	mg/kg		5	n.d.	---
三溴聯苯醚 / Tribromodiphenyl ether	mg/kg		5	n.d.	---
四溴聯苯醚 / Tetrabromodiphenyl ether	mg/kg		5	n.d.	---
五溴聯苯醚 / Pentabromodiphenyl ether	mg/kg		5	n.d.	---
六溴聯苯醚 / Hexabromodiphenyl ether	mg/kg		5	n.d.	---
七溴聯苯醚 / Heptabromodiphenyl ether	mg/kg		5	n.d.	---
八溴聯苯醚 / Octabromodiphenyl ether	mg/kg		5	n.d.	---
九溴聯苯醚 / Nonabromodiphenyl ether	mg/kg		5	n.d.	---
十溴聯苯醚 / Decabromodiphenyl ether	mg/kg		5	n.d.	---

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TAIWAN, R. O. C.



備註(Note) :

1. mg/kg = ppm ; 0.1wt% = 1000ppm
2. n.d. = Not Detected (未檢出)
3. MDL = Method Detection Limit (方法偵測極限值)
4. "-" = Not Regulated (無規格值)
5. "---" = Not Conducted (未測項目)
6. ** = Qualitative analysis (No Unit) 定性分析(無單位)
7. # =
 - a. Positive means the presence of CrVI on the tested areas
(Positive表示測試區域偵測到六價鉻)
 - b. Negative means the absence of CrVI on the tested areas
(Negative表示測試區域未偵測到六價鉻)

The detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm² tested areas. / 該溶液濃度 \geq 0.02 mg/kg with 50 cm² (tested areas)

8. 樣品的測試是基於申請人要求混合測試，報告中的混合測試結果不代表其中個別單一材質的含量。(The samples was/were analyzed on behalf of the applicant as mixing sample in one testing. The above results was/were only given as the informality value.)

測試報告 Test Report

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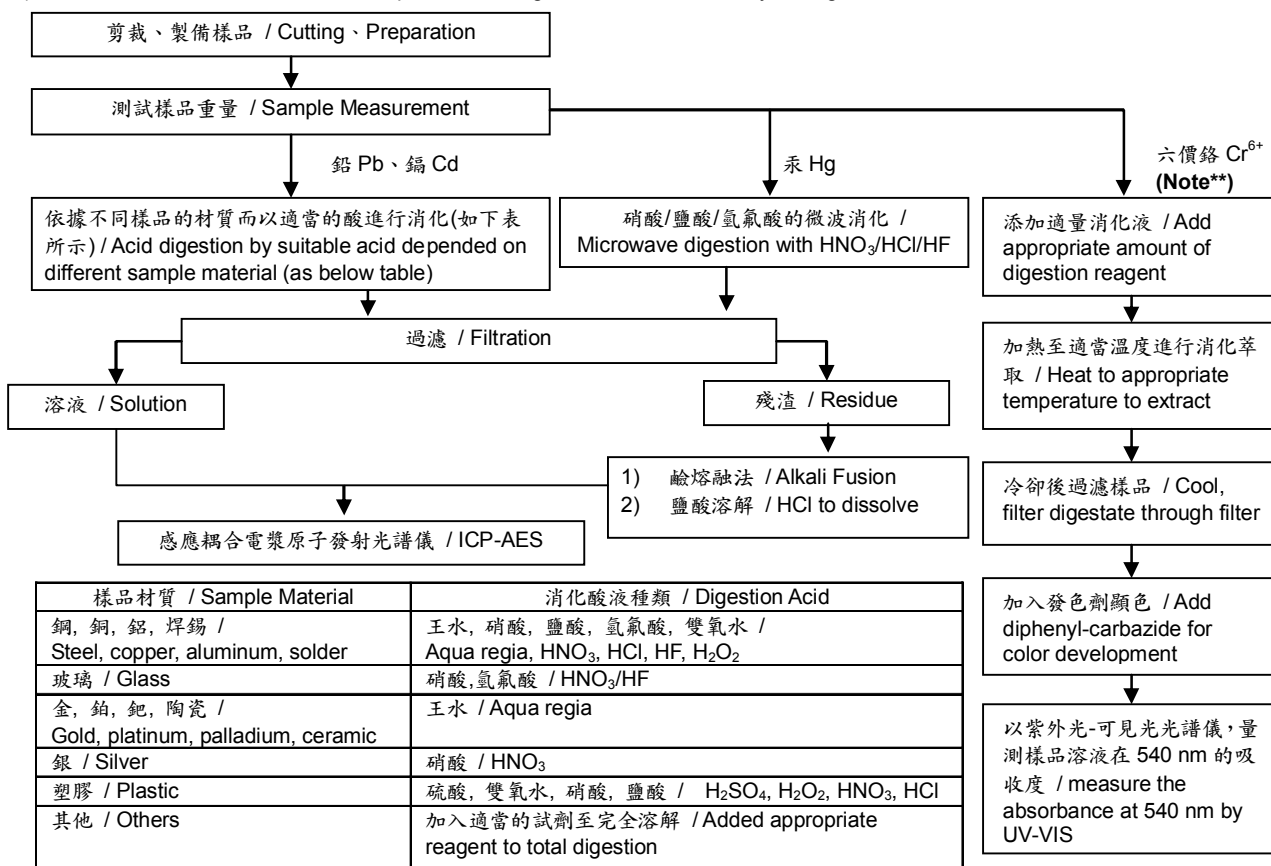
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- 1) 根據以下的流程圖之條件，樣品已完全溶解。(六價鉻測試方法除外) / These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr⁶⁺ test method excluded)
- 2) 測試人員：楊登偉 / Name of the person who made measurement: Climbgreat Yang
- 3) 測試負責人：張啓興 / Name of the person in charge of measurement: Troy Chang



Note** : (1) 針對非金屬材料加入鹼性消化液，加熱至 90~95℃ 萃取。 / For non-metallic material, add alkaline digestion reagent and heat to 90~95℃.
(2) 針對金屬材料加入純水，加熱至沸騰萃取。 / For metallic material, add pure water and heat to boiling.

測試報告

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友順科技股份有限公司

UNISONIC TECHNOLOGIES CO., LTD.

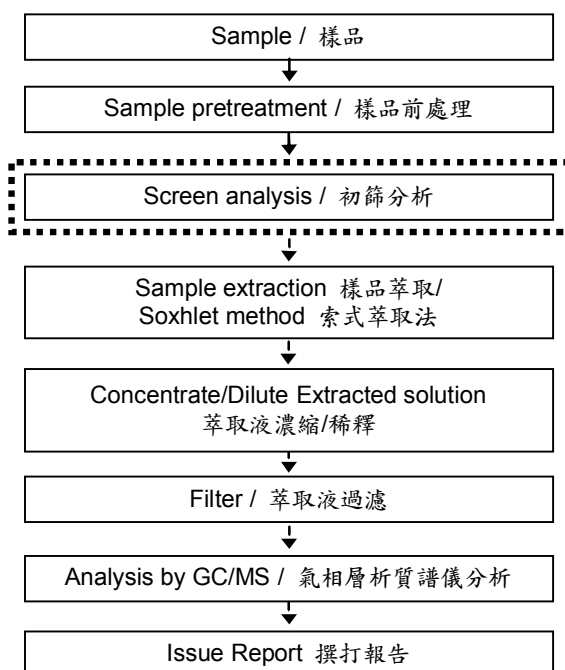
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TAIWAN, R. O. C.



多溴聯苯/多溴聯苯醚分析流程圖 / PBB/PBDE analytical FLOW CHART

- 測試人員：翁賜彬 / Name of the person who made measurement: Roman Wong
- 測試負責人：張啓興 / Name of the person in charge of measurement: Troy Chang
- 初次測試程序 / First testing process →
- 選擇性篩檢程序 / Optional screen process ······
- 確認程序 / Confirmation process - - - -▶



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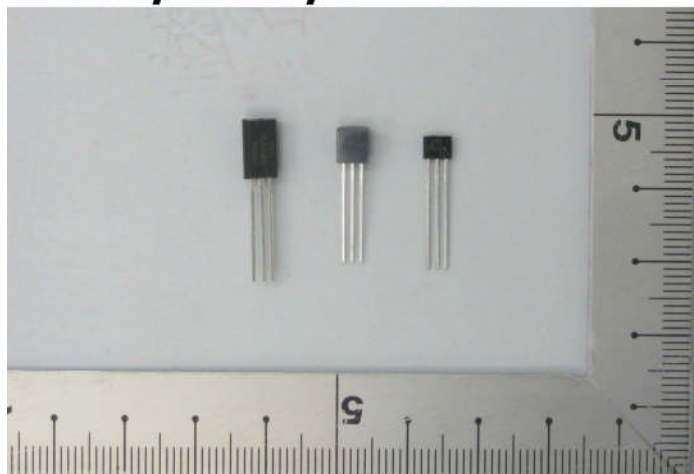
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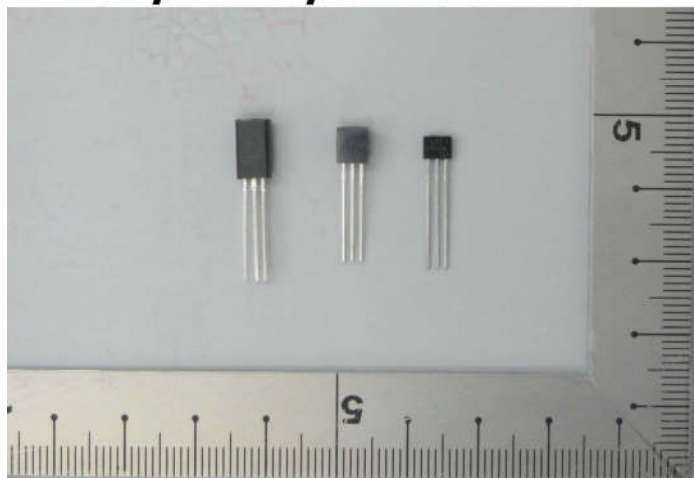


* 照片中如有箭頭標示，則表示為實際檢測之樣品/部位。*
(The tested sample / part is marked by an arrow if it's shown on the photo.)

CE/2013/82466 NO.1



CE/2013/82466 NO.2



** 報告結尾 (End of Report) **

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