全宇昕科技股份有限公司
Cystech Electronics Corp.

235 台北縣中和市中正路 716 號 15 樓之 7(遠東世紀廣場 L 棟)
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(Far East Century Park,Building L)
TEL:+886-2-8227-3826 FAX:+886-2-8227-3830

承 認 書

FOR APPROVAL

客戶/Customer	:	盟創科技股份有限公司
零件類別/Product Name	:	MOSFET
品名/Part No.	:	MTE020N10RF3
客戶料號		16-220-000008Z
產品編號/Ordering Device		MTE020N10RF3-0-T7-G
分類/Rank	:	-
外觀/Outline	:	TO-263
包裝/Package	:	800 PCS/Tape & Reel
發行份數/Copies	:	一式 2 份
連絡人	:	羅曉琦/Angela

承認書內容
1. MTE020N10RF3 _規格書
2. SGS test report for TO-263

AUTHORIZED SIGNATURE	
CYSTEK	CUSTOMER
全宇昕科技股份有限公司 Cystek data sheet 請勿轉印 TEL:(02)82273826 台北縣中和市中正路716號15樓之7	
DATE： 2021/05/03	DATE: / /

N-Channel Enhancement Mode Power MOSFET

MTE020N10RF3

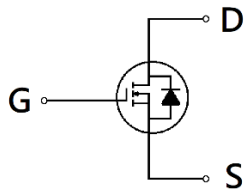
Features

- Low On Resistance
- Simple Drive Requirement
- Low Gate Charge
- Fast Switching Characteristic
- RoHS compliant package

BV_{DSS}	100V
I_D@V_{GS}=10V, T_C=25˚C	24.5A
I_D@V_{GS}=10V, T_A=25˚C	7.5A
$R_{DS(ON)}$@V_{GS}=10V, I_D=20A	21mΩ

Equivalent Circuit

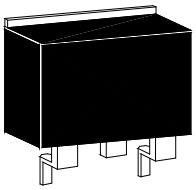
MTE020N10RF3



G : Gate S : Source D : Drain

Outline

TO-263



G D S

Ordering Information

Device	Package	Shipping
MTE020N10RF3-0-T7-G	TO-263 (Pb-free lead plating and halogen-free package)	800 pcs / Tape & Reel

- Environment friendly grade : S for RoHS compliant products, G for RoHS compliant and green compound products
- Packing spec, T7 : 800 pcs / tape & reel,13” reel
- Product rank, zero for no rank products
- Product name

Absolute Maximum Ratings (T_A=25°C)

Parameter		Symbol	Limits	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current @ V_{GS}=10V, T_C=25°C	*a	I_D	24.5	A
Continuous Drain Current @ V_{GS}=10V, T_C=100°C	*a		15.5	
Continuous Drain Current @ V_{GS}=10V, T_A=25°C	*b		7.5	
Continuous Drain Current @ V_{GS}=10V, T_A=70°C	*b		6	
Pulsed Drain Current	*c	I_{DM}	98	
Continuous Body Diode Forward Current @ T_C=25°C	*a	I_S	20	
Avalanche Current @ L=0.1mH		I_{AS}	15	
Avalanche Energy @ L=0.5mH		E_{AS}	25	mJ
Total Power Dissipation	T_C=25°C *a	P_D	35	W
	T_C=100°C *a		14	
	T_A=25°C *b		3.3	
	T_A=70°C *b		2.1	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55~+150	°C

Thermal Data

Parameter		Symbol	Steady State	Unit
Thermal Resistance, Junction-to-case		$R_{\theta JC}$	3.5	°C/W
Thermal Resistance, Junction-to-ambient	*b	$R_{\theta JA}$	37	

Note:

*a. The power dissipation P_D is based on $T_{J(MAX)}$=150°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.

*b. The value of $R_{\theta JA}$ is measured with the device mounted on 1 in² FR-4 board with 2 oz. copper, in a still air environment with T_A=25°C. The power dissipation P_D is based on $R_{\theta JA}$ and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.

*c. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C. Ratings are based on low frequency and low duty cycles to keep initial T_J=25°C.

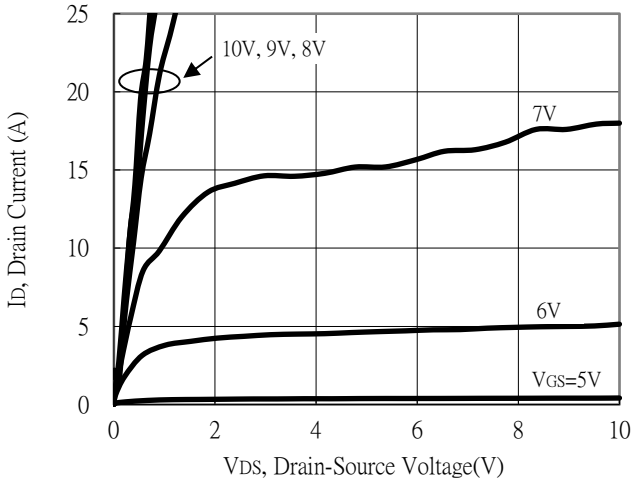
Characteristics (T_A=25°C, unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	100	-	-	V	V_{GS}=0V, I_D=250μA
$V_{GS(th)}$	2	-	4		V_{DS}=V_{GS}, I_D=250μA
G_{FS}	-	32	-	S	V_{DS}=5V, I_D=20A
I_{GSS}	-	-	±100	nA	V_{GS}=±20V, V_{DS}=0V
I_{DSS}	-	-	1	μA	V_{DS}=80V, V_{GS}=0V
$R_{DS(ON)}$	-	21	30	mΩ	V_{GS}=10V, I_D=20A
Dynamic					
Ciss	-	830	-	pF	V_{DS}=50V, V_{GS}=0V, f=1MHz
Coss	-	108	-		
Crss	-	16	-		
Rg	-	1.3	-	Ω	f=1MHz
Qg *1, 2	-	13	-	nC	V_{DS}=50V, I_D=20A, V_{GS}=10V
Qgs *1, 2	-	5.6	-		
Qgd *1, 2	-	2.8	-		
$t_{d(ON)}$ *1, 2	-	13	-	ns	V_{DS}=50V, I_D=20A, V_{GS}=10V, R_{GS}=1Ω
tr *1, 2	-	15	-		
$t_{d(OFF)}$ *1, 2	-	18	-		
t_f *1, 2	-	6.2	-		
Source-Drain Diode					
V_{SD} *1	-	0.9	1.2	V	I_S=20A, V_{GS}=0V
trr	-	30	-	ns	I_F=20A, dI_F/dt=100A/μs
Qrr	-	40	-	nC	

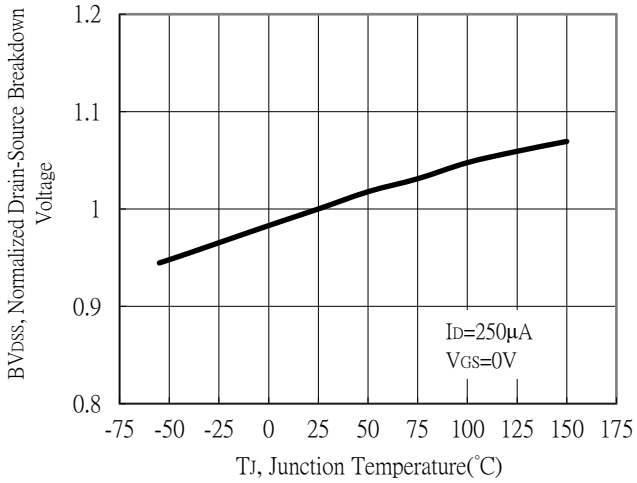
Note:
*1. Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%
*2. Independent of operating temperature

Typical Characteristics

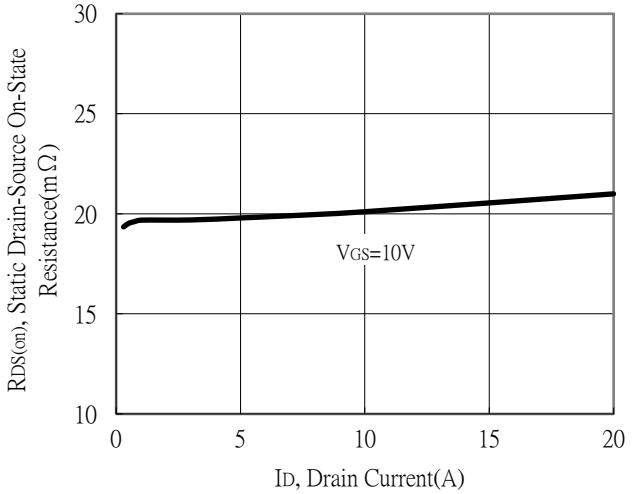
Typical Output Characteristics



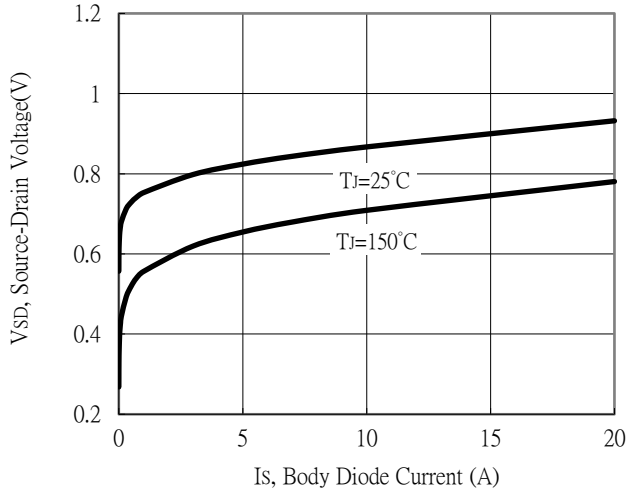
Breakdown Voltage vs Ambient Temperature



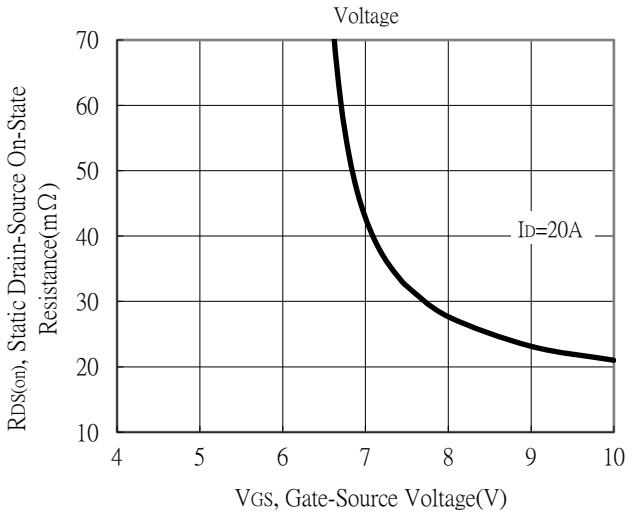
Static Drain-Source On-State resistance vs Drain Current



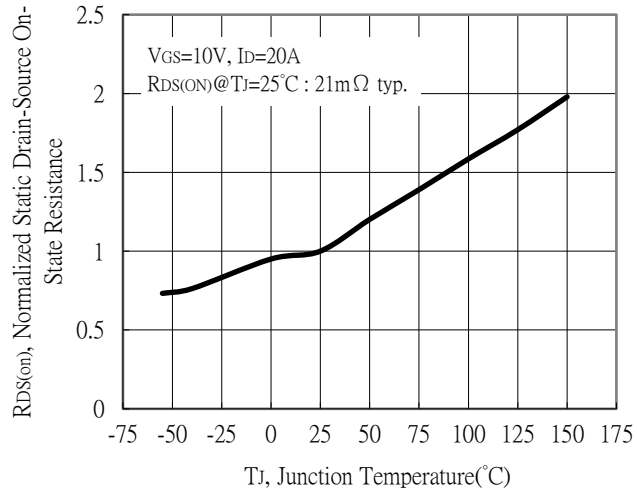
Body Diode Current vs Source-Drain Voltage



Static Drain-Source On-State Resistance vs Gate-Source Voltage

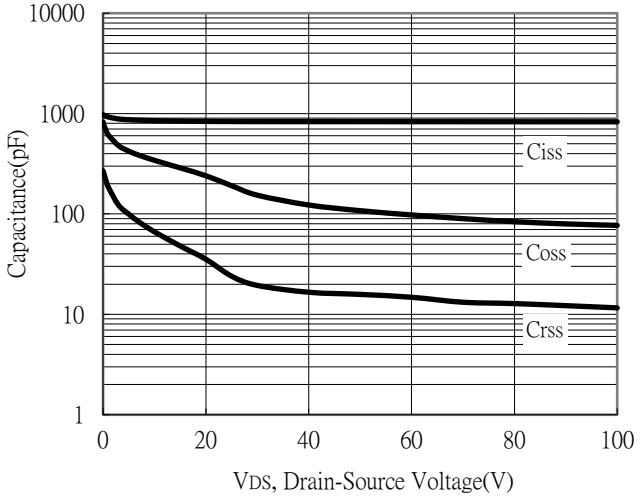


Drain-Source On-State Resistance vs Junction Temperature

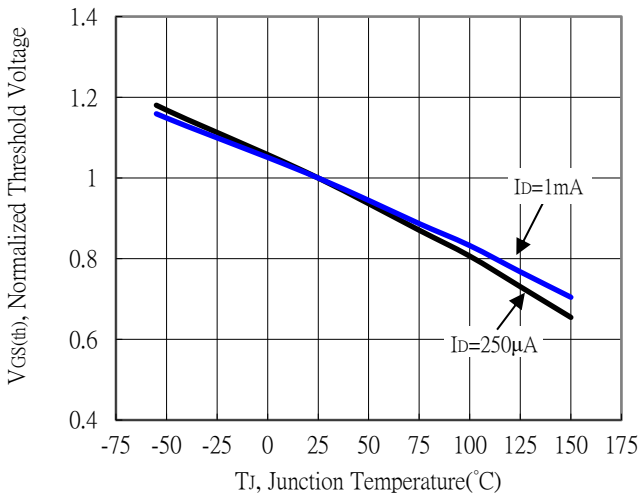


Typical Characteristics (Cont.)

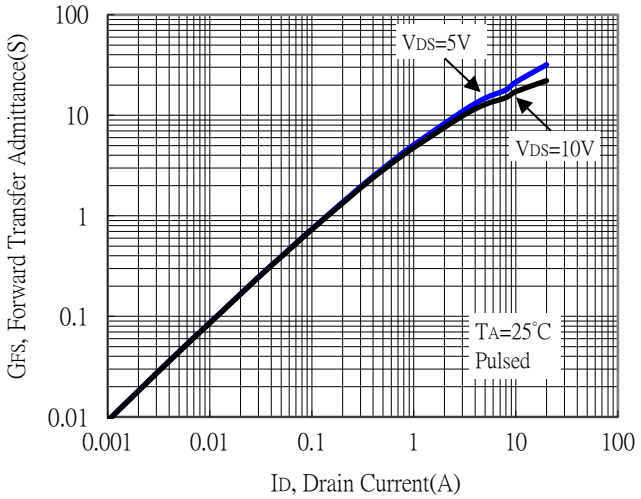
Capacitance vs Drain-to-Source Voltage



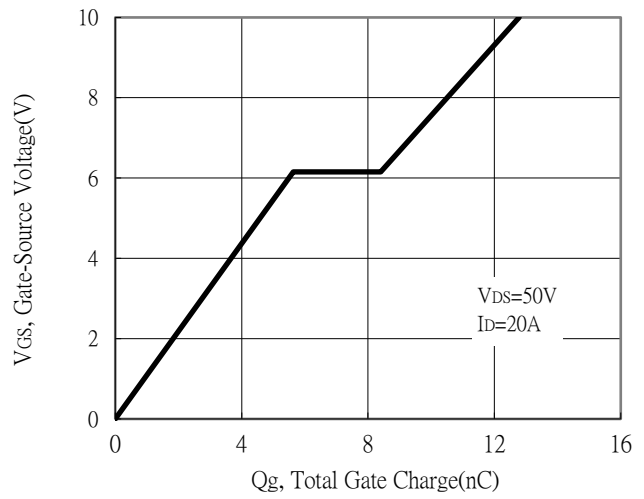
Threshold Voltage vs Junction Temperature



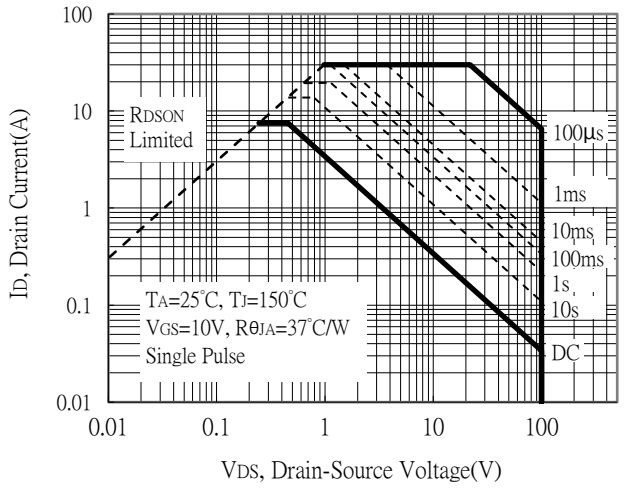
Forward Transfer Admittance vs Drain Current



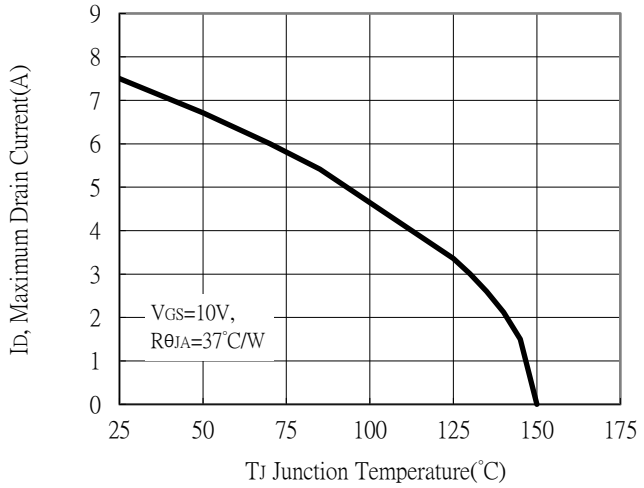
Gate Charge Characteristics



Maximum Safe Operating Area

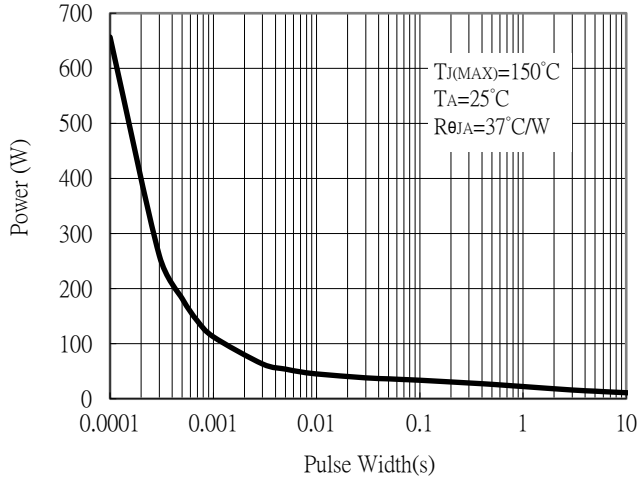


Maximum Drain Current vs Junction Temperature

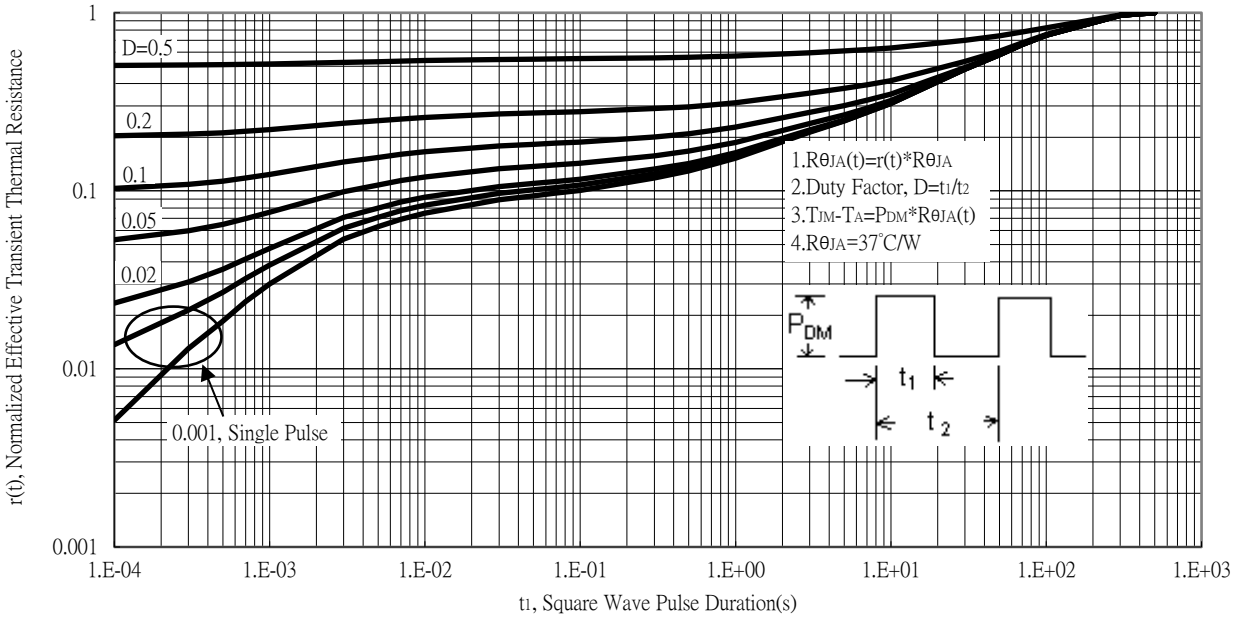


Typical Characteristics (Cont.)

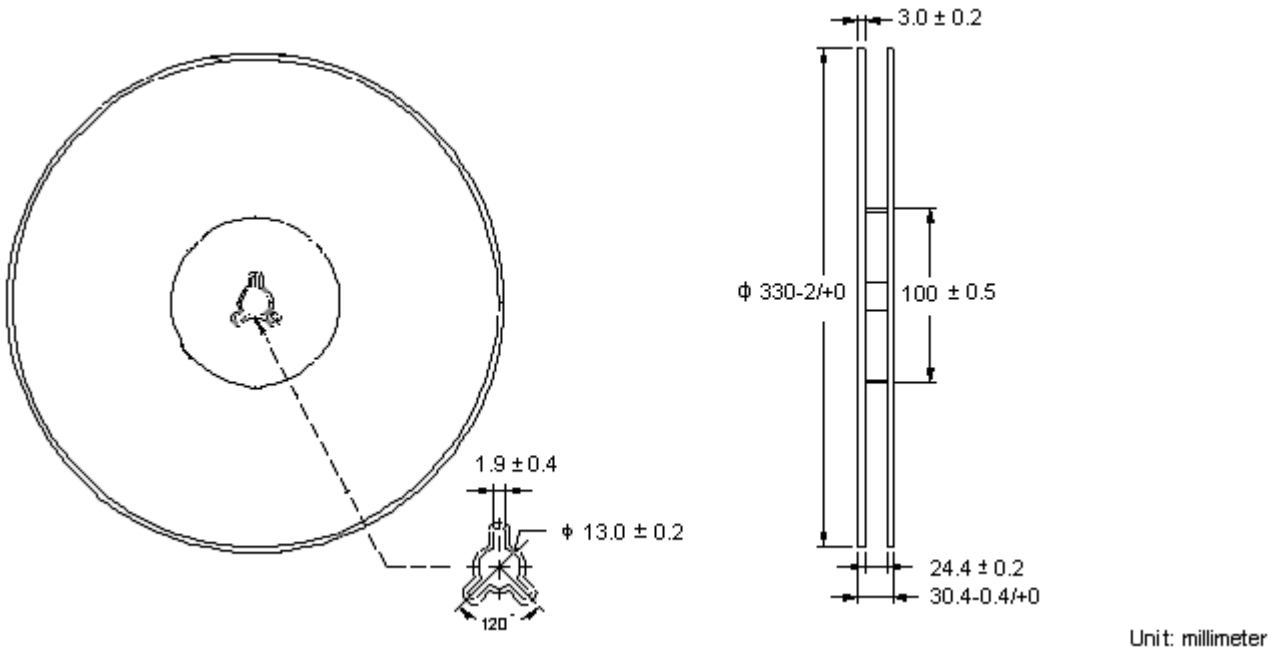
Single Pulse Power Rating, Junction to Ambient



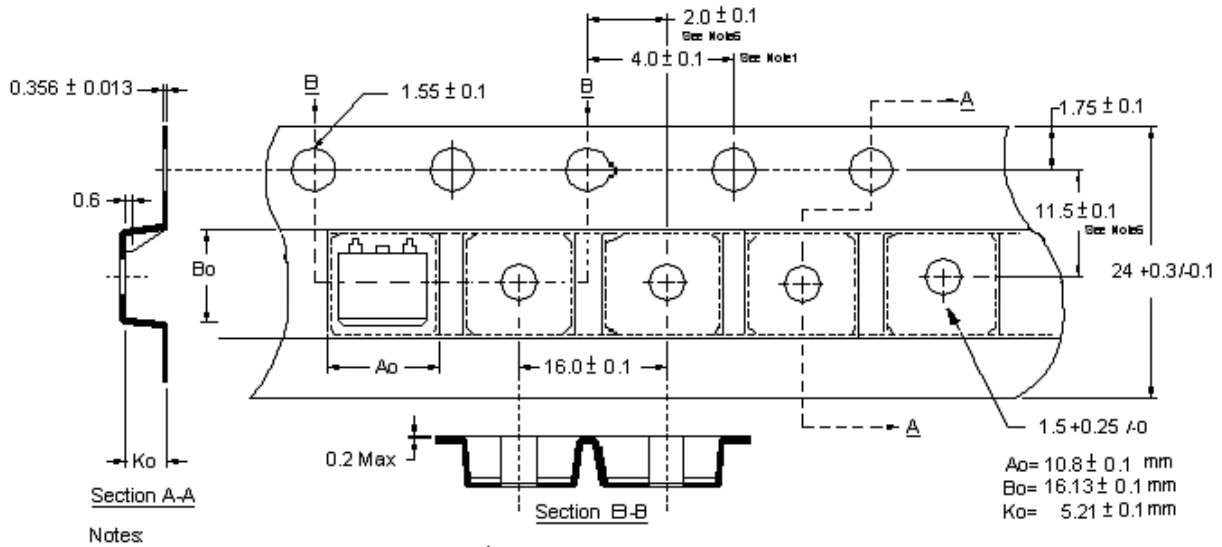
Transient Thermal Response Curves



Reel Dimension



Carrier Tape Dimension



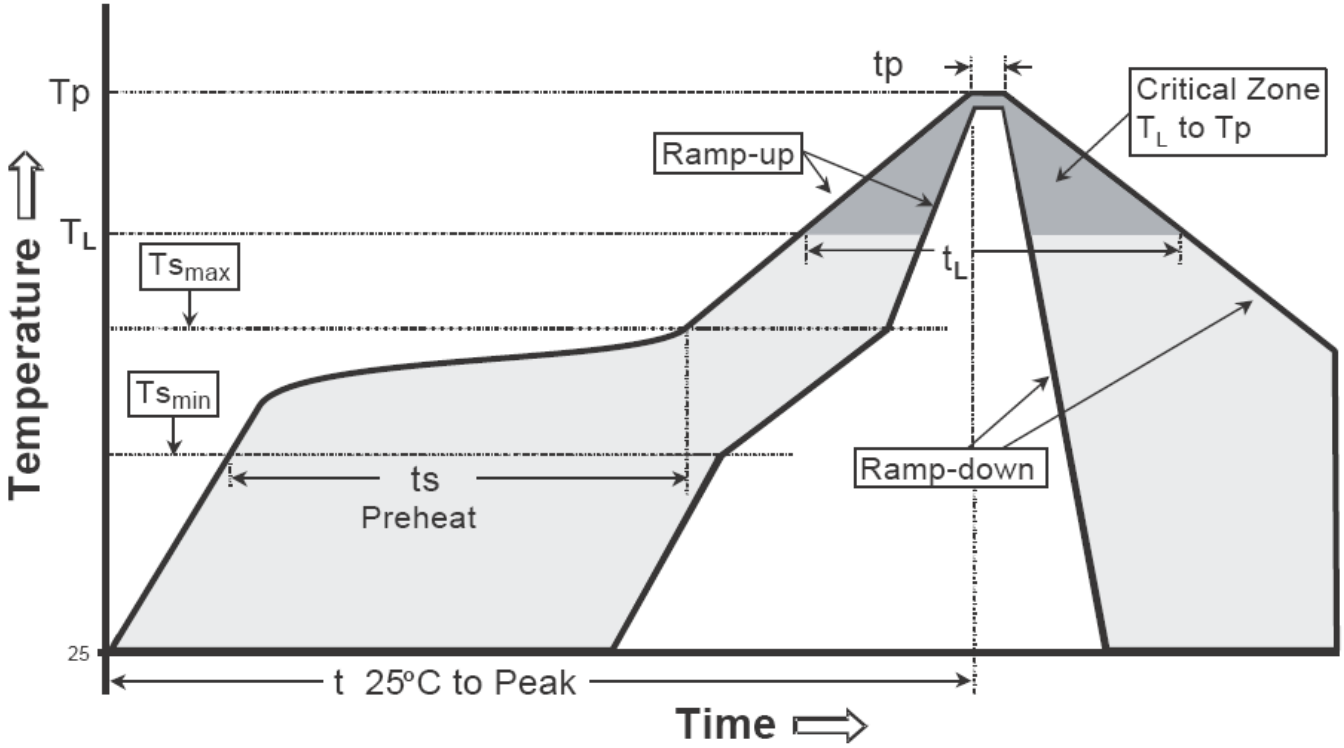
Notes:
1. 10 sprocket hole pitch cumulative tolerace ±0.2.
2. Camber not to exceed 1mm in 100mm.
3. Material: Conductive Black Advantek Polystyrene.
4. Ao & Bo measured on a plane 0.3mm above the bottom of the pocket.
5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
6. Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole.

Unit : millimeter

Recommended wave soldering condition

Product	Peak Temperature	Soldering Time
Pb-free devices	260 +0/-5 °C	5 +1/-1 seconds

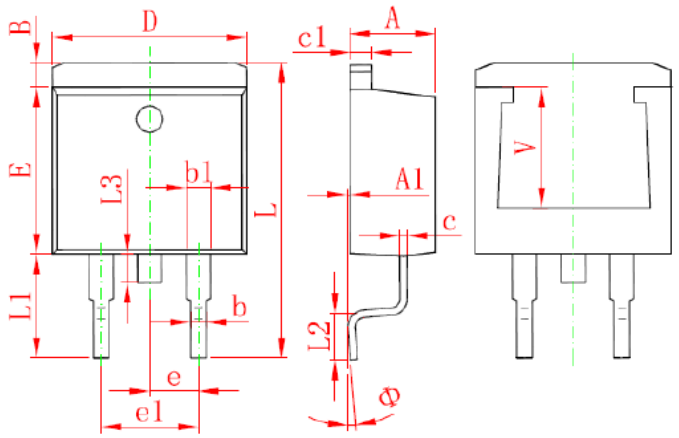
Recommended temperature profile for IR reflow



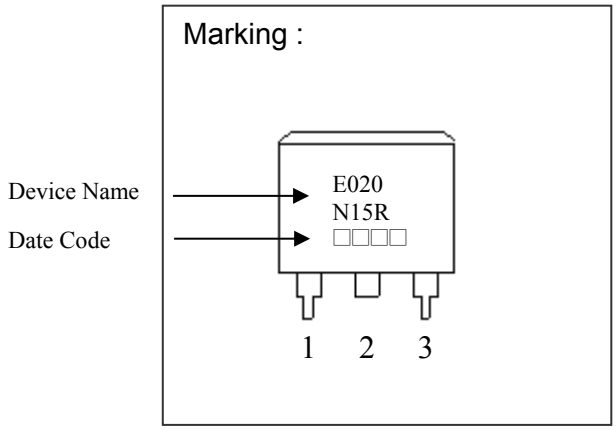
Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat −Temperature Min(T_S min) −Temperature Max(T_S max) −Time($t_{s\,min}$ to $t_{s\,max}$)	100°C 150°C 60-120 seconds	150°C 200°C 60-180 seconds
Time maintained above: −Temperature (T_L) − Time (t_L)	183°C 60-150 seconds	217°C 60-150 seconds
Peak Temperature(T_P)	240 +0/-5 °C	260 +0/-5 °C
Time within 5°C of actual peak temperature(tp)	10-30 seconds	20-40 seconds
Ramp down rate	6°C/second max.	6°C/second max.
Time 25 °C to peak temperature	6 minutes max.	8 minutes max.

Note : All temperatures refer to topside of the package, measured on the package body surface.

TO-263 Dimension



3-Lead Plastic Surface Mounted Package
CYStek Package Code : F3



Style : Pin 1.Gate 2.Drain 3.Source

Date Code(counting from left to right) :
1st code: year code, the last digit of Christian year
2nd code : month code, Jan→A, Feb→B, Mar→C, Apr→D
May→E, Jun→F, Jul→G, Aug→H, Sep→J,
Oct→K, Nov→L, Dec→M
3rd and 4th codes : production serial number, 01~99

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	4.470	4.670	0.176	0.184	e	2.540	TYP	0.100	TYP
A1	0.000	0.150	0.000	0.006	e1	4.980	5.180	0.196	0.204
B	1.120	1.420	0.044	0.056	L	14.940	15.500	0.588	0.610
b	0.710	0.910	0.028	0.036	L1	4.950	5.450	0.195	0.215
b1	1.170	1.370	0.046	0.054	L2	2.340	2.740	0.092	0.108
c	0.310	0.530	0.012	0.021	L3	1.300	1.700	0.051	0.067
c1	1.170	1.370	0.046	0.054	Φ	0°	8°	0°	8°
D	10.010	10.310	0.394	0.406	V	6.400	REF	0.253	REF
E	8.500	8.900	0.335	0.350					

Notes : 1.Controlling dimension : millimeters.
2.Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.
3.If there is any question with packing specification or packing method, please contact your local CYStek sales office.

Material :

- Lead : Pure tin plated.
- Mold Compound : Epoxy resin family, flammability solid burning class:UL94V-0.

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全宇昕科技股份有限公司

CYStech Electronics Corp.

SGS TEST REPORT

Package：	TO263(7L)
SGS Document no. ：	ETR20C03576
Date：	2020/12/22

AUTHORIZED SIGNAUTRE

OFFICE ADD：13F-7, NO. 716, ZHONGZHENG RD., ZHONGHE DISTRICT, NEW TAIPEI CITY, TAIWAN, 235-52 (FAR EAST CENTURY PARK, BUILDING L)

TEL：(02) 8227-3826

FAX：(02) 8227-3830

http://www.cystekec.com/

簽名有效
For Question Please Contact with SGS
www.sgs.com.tw

測試報告
Test Report

號碼(No.): ETR20C03576　　日期(Date): 22-Dec-2020　　

全宇昕科技股份有限公司 (CYSTECH ELECTRONICS CORP.)
235-52新北市中和區中正路716號15F之7(遠東世紀廣場L棟) (15F-7, NO.716, ZHONGZHENG RD, ZHONGHE DISTRICT, NEW TAIPEI CITY 235-52, TAIWAN (FAR EAST CENTURY PARK, BUILDING L))

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) : 全宇昕科技股份有限公司 (CYSTECH ELECTRONICS CORP.)
樣品名稱(Sample Name) : DFN SERIES、SOP SERIES、SOT SERIES、TO277、TO251、TO252、TSOP-6、TO92(L)、TO126(ML)、TO220(FP)、TO262、TO263(7L)、DBS、SAME、SMX SERIES、GEM2928-8J

==========

收件日(Sample Receiving Date) : 15-Dec-2020
測試期間(Testing Period) : 15-Dec-2020 to 22-Dec-2020

測試需求(Test Requested) : 依據客戶要求進行測試，測試項目請參閱測試結果表格。 (Testing item(s) is/are specified by client. Please refer to result table for testing item(s).)

測試結果(Test Results) : 請參閱下一頁 (Please refer to following pages.)

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

CHECK REPORT
PIN CODE: 34B08B32

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測試報告
Test Report

全宇昕科技股份有限公司 (CYSTECH ELECTRONICS CORP.)
235-52新北市中和區中正路716號15F之7(遠東世紀廣場L棟) (15F-7, NO.716, ZHONGZHENG RD, ZHONGHE DISTRICT, NEW TAIPEI CITY 235-52, TAIWAN (FAR EAST CENTURY PARK, BUILDING L))

測試部位敘述 (Test Part Description)

No.1 : 混測銀色金屬接腳鍍層 (MIXED PLATING LAYER OF SILVER COLORED METAL PIN)
No.2 : 混測銀色金屬接腳底材 (MIXED BASE MATERIAL OF SILVER COLORED METAL PIN)
No.3 : 混測銀色金屬 (含鍍層) (MIXED SILVER COLORED METAL (INCLUDING THE PLATING LAYER))
No.4 : 混測本體 (MIXED BODY)

測試結果 (Test Results)

測試項目 (Test Items)	測試方法 (Method)	單位 (Unit)	MDL	結果 (Result)		
				No.1	No.2	No.3
鎘 (Cd) (Cadmium (Cd)) (CAS No.: 7440-43-9)	酸洗脫鍍層，參考IEC 62321-5: 2013，以感應耦合電漿發射光譜儀分析。(IEC 62321-5: 2013 application of modified digestion by surface etching, analysis was performed by ICP-OES.)	mg/kg	2	n.d.	---	---
鉛 (Pb) (Lead (Pb)) (CAS No.: 7439-92-1)		mg/kg	2	76.3	---	---
汞 (Hg) (Mercury (Hg)) (CAS No.: 7439-97-6)	酸洗脫鍍層，參考IEC 62321-4: 2013+AMD1: 2017，以感應耦合電漿發射光譜儀分析。(IEC 62321-4: 2013+AMD1: 2017 application of modified digestion by surface etching, analysis was performed by ICP-OES.)	mg/kg	2	n.d.	---	---
鎘 (Cd) (Cadmium (Cd)) (CAS No.: 7440-43-9)	參考IEC 62321-5: 2013，以感應耦合電漿發射光譜儀分析。(With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.)	mg/kg	2	---	n.d.	---
鉛 (Pb) (Lead (Pb)) (CAS No.: 7439-92-1)		mg/kg	2	---	6.94	---
汞 (Hg) (Mercury (Hg)) (CAS No.: 7439-97-6)	參考IEC 62321-4: 2013+ AMD1: 2017，以感應耦合電漿發射光譜儀分析。(With reference to IEC 62321-4: 2013+ AMD1: 2017, analysis was performed by ICP-OES.)	mg/kg	2	---	n.d.	---
六價鉻 (Hexavalent Chromium) Cr(VI) (CAS No.: 18540-29-9) (#2)	參考IEC 62321-7-1: 2015，以紫外光-可見光分光光度計分析。(With reference to IEC 62321-7-1: 2015, analysis was performed by UV-VIS.)	μg/cm²	0.1	n.d.	n.d.	---

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測試報告
Test Report

全宇昕科技股份有限公司 (CYSTECH ELECTRONICS CORP.)
235-52新北市中和區中正路716號15F之7(遠東世紀廣場L棟) (15F-7, NO.716, ZHONGZHENG RD, ZHONGHE DISTRICT, NEW TAIPEI CITY 235-52, TAIWAN (FAR EAST CENTURY PARK, BUILDING L))

測試項目 (Test Items)	測試方法 (Method)	單位 (Unit)	MDL	結果 (Result)		
				No.1	No.2	No.3
一溴聯苯 (Monobromobiphenyl)	參考IEC 62321-6: 2015，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-6: 2015, analysis was performed by GC/MS.)	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.
多溴聯苯總和 (Sum of PBBs)		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.
多溴聯苯醚總和 (Sum of PBDEs)		mg/kg	-	---	---	n.d.

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全宇昕科技股份有限公司 (CYSTECH ELECTRONICS CORP.)
235-52新北市中和區中正路716號15F之7(遠東世紀廣場L棟) (15F-7, NO.716, ZHONGZHENG RD, ZHONGHE DISTRICT, NEW TAIPEI CITY 235-52, TAIWAN (FAR EAST CENTURY PARK, BUILDING L))

測試項目 (Test Items)	測試方法 (Method)	單位 (Unit)	MDL	結果 (Result)		
				No.1	No.2	No.3
鄰苯二甲酸丁苯甲酯 (BBP) (Butyl benzyl phthalate (BBP)) (CAS No.: 85-68-7)	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	---	---	n.d.
鄰苯二甲酸二丁酯 (DBP) (Dibutyl phthalate (DBP)) (CAS No.: 84-74-2)	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	---	---	n.d.
鄰苯二甲酸二(2-乙基己基)酯 (DEHP) (Di-(2-ethylhexyl) phthalate (DEHP)) (CAS No.: 117-81-7)	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	---	---	n.d.
鄰苯二甲酸二異丁酯 (DIBP) (Diisobutyl phthalate (DIBP)) (CAS No.: 84-69-5)	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	---	---	n.d.
鄰苯二甲酸二異癸酯 (DIDP) (Diisodecyl phthalate (DIDP)) (CAS No.: 26761-40-0, 68515-49-1)	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	---	---	n.d.
鄰苯二甲酸二異壬酯 (DINP) (Diisononyl phthalate (DINP)) (CAS No.: 28553-12-0, 68515-48-0)	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	---	---	n.d.
鄰苯二甲酸二正辛酯 (DNOP) (Di-n-octyl phthalate (DNOP)) (CAS No.: 117-84-0)	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	---	---	n.d.
鄰苯二甲酸二正己酯 (DNHP) (Di-n-hexyl phthalate (DNHP)) (CAS No.: 84-75-3)	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	---	---	n.d.

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測試報告

Test Report

全宇昕科技股份有限公司 (CYSTECH ELECTRONICS CORP.)
235-52新北市中和區中正路716號15F之7(遠東世紀廣場L棟) (15F-7, NO.716, ZHONGZHENG RD, ZHONGHE DISTRICT, NEW TAIPEI CITY 235-52, TAIWAN (FAR EAST CENTURY PARK, BUILDING L))

測試項目 (Test Items)	測試方法 (Method)	單位 (Unit)	MDL	結果 (Result)
				No.4
鎘 (Cd) (Cadmium (Cd)) (CAS No.: 7440-43-9)	參考IEC 62321-5: 2013，以感應耦合電漿發射光譜儀分析。(With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.)	mg/kg	2	n.d.
鉛 (Pb) (Lead (Pb)) (CAS No.: 7439-92-1)		mg/kg	2	3180
汞 (Hg) (Mercury (Hg)) (CAS No.: 7439-97-6)	參考IEC 62321-4: 2013+ AMD1: 2017，以感應耦合電漿發射光譜儀分析。(With reference to IEC 62321-4: 2013+ AMD1: 2017, analysis was performed by ICP-OES.)	mg/kg	2	n.d.
六價鉻 Cr(VI) (Hexavalent Chromium Cr(VI)) (CAS No.: 18540-29-9)	參考IEC 62321-7-2: 2017，以紫外光-可見光分光光度計分析。(With reference to IEC 62321-7-2: 2017, analysis was performed by UV-VIS.)	mg/kg	8	n.d.
一溴聯苯 (Monobromobiphenyl)	參考IEC 62321-6: 2015，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-6: 2015, analysis was performed by GC/MS.)	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.
多溴聯苯總和 (Sum of PBBs)		mg/kg	-	n.d.

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測試項目 (Test Items)	測試方法 (Method)	單位 (Unit)	MDL	結果 (Result) No.4
一溴聯苯醚 (Monobromodiphenyl ether)	參考IEC 62321-6: 2015，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-6: 2015, analysis was performed by GC/MS.)	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.
多溴聯苯醚總和 (Sum of PBDEs)		mg/kg	-	n.d.
鄰苯二甲酸丁苯甲酯 (BBP) (Butyl benzyl phthalate (BBP)) (CAS No.: 85-68-7)	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.
鄰苯二甲酸二丁酯 (DBP) (Dibutyl phthalate (DBP)) (CAS No.: 84-74-2)	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.
鄰苯二甲酸二(2-乙基己基)酯 (DEHP) (Di-(2-ethylhexyl) phthalate (DEHP)) (CAS No.: 117-81-7)	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.
鄰苯二甲酸二異丁酯 (DIBP) (Diisobutyl phthalate (DIBP)) (CAS No.: 84-69-5)	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.
鄰苯二甲酸二異癸酯 (DIDP) (Diisodecyl phthalate (DIDP)) (CAS No.: 26761-40-0, 68515-49-1)	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.

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全宇昕科技股份有限公司 (CYSTECH ELECTRONICS CORP.)
235-52新北市中和區中正路716號15F之7(遠東世紀廣場L棟) (15F-7, NO.716, ZHONGZHENG RD, ZHONGHE DISTRICT, NEW TAIPEI CITY 235-52, TAIWAN (FAR EAST CENTURY PARK, BUILDING L))

測試項目 (Test Items)	測試方法 (Method)	單位 (Unit)	MDL	結果 (Result)
				No.4
鄰苯二甲酸二異壬酯 (DINP) (Diisononyl phthalate (DINP)) (CAS No.: 28553-12-0, 68515-48-0)	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.
鄰苯二甲酸二正辛酯 (DNOP) (Di-n-octyl phthalate (DNOP)) (CAS No.: 117-84-0)	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.
六溴環十二烷及所有主要被辨別出的異構物 (HBCDD) (α- HBCDD, β- HBCDD, γ- HBCDD) (Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α- HBCDD, β- HBCDD, γ- HBCDD)) (CAS No.: 25637-99-4, 3194-55-6 (134237-51-7, 134237-50-6, 134237-52-8))	參考IEC 62321: 2008，以氣相層析儀/質譜儀分析。(With reference to IEC 62321: 2008, analysis was performed by GC/MS.)	mg/kg	5	n.d.
氟 (F) (Fluorine (F)) (CAS No.: 14762-94-8)	參考BS EN 14582: 2016，以離子層析儀分析。(With reference to BS EN 14582: 2016, analysis was performed by IC.)	mg/kg	50	n.d.
氯 (Cl) (Chlorine (Cl)) (CAS No.: 22537-15-1)	參考BS EN 14582: 2016，以離子層析儀分析。(With reference to BS EN 14582: 2016, analysis was performed by IC.)	mg/kg	50	n.d.
溴 (Br) (Bromine (Br)) (CAS No.: 10097-32-2)	參考BS EN 14582: 2016，以離子層析儀分析。(With reference to BS EN 14582: 2016, analysis was performed by IC.)	mg/kg	50	n.d.
碘 (I) (Iodine (I)) (CAS No.: 14362-44-8)	參考BS EN 14582: 2016，以離子層析儀分析。(With reference to BS EN 14582: 2016, analysis was performed by IC.)	mg/kg	50	n.d.

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全宇昕科技股份有限公司 (CYSTECH ELECTRONICS CORP.)
235-52新北市中和區中正路716號15F之7(遠東世紀廣場L棟) (15F-7, NO.716, ZHONGZHENG RD, ZHONGHE DISTRICT, NEW TAIPEI CITY 235-52, TAIWAN (FAR EAST CENTURY PARK, BUILDING L))

測試項目 (Test Items)	測試方法 (Method)	單位 (Unit)	MDL	結果 (Result)
				No.4
全氟辛烷磺酸及其鹽類 (PFOS and its salts) (CAS No.: 1763-23-1 and its salts)	參考CEN/TS 15968: 2010，以液相層析串聯質譜儀分析。(With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.)	mg/kg	0.01	n.d.
全氟辛酸及其鹽類 (PFOA and its salts) (CAS No.: 335-67-1 and its salts)	參考CEN/TS 15968: 2010，以液相層析串聯質譜儀分析。(With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.)	mg/kg	0.01	n.d.
四溴雙酚-A (TBBP-A) (Tetrabromobisphenol A (TBBP-A)) (CAS No.: 79-94-7)	參考RSTS-E&E-121，以液相層析儀/質譜儀分析。(With reference to RSTS-E&E-121, analysis was performed by LC/MS.)	mg/kg	10	n.d.
鄰苯二甲酸二正己酯 (DNHP) (Di-n-hexyl phthalate (DNHP)) (CAS No.: 84-75-3)	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.
銻 (Sb) (Antimony (Sb)) (CAS No.: 7440-36-0)	參考US EPA 3052: 1996，以感應耦合電漿發射光譜儀分析。(With reference to US EPA 3052: 1996, analysis was performed by ICP-OES.)	mg/kg	2	56.0
鈹 (Be) (Beryllium (Be)) (CAS No.: 7440-41-7)	參考US EPA 3052: 1996，以感應耦合電漿發射光譜儀分析。(With reference to US EPA 3052: 1996, analysis was performed by ICP-OES.)	mg/kg	2	n.d.
砷 (As) (Arsenic (As)) (CAS No.: 7440-38-2)	參考US EPA 3052: 1996，以感應耦合電漿發射光譜儀分析。(With reference to US EPA 3052: 1996, analysis was performed by ICP-OES.)	mg/kg	2	n.d.

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全宇昕科技股份有限公司 (CYSTECH ELECTRONICS CORP.)
235-52新北市中和區中正路716號15F之7(遠東世紀廣場L棟) (15F-7, NO.716, ZHONGZHENG RD, ZHONGHE DISTRICT, NEW TAIPEI CITY 235-52, TAIWAN (FAR EAST CENTURY PARK, BUILDING L))

備註(Note)：

1. mg/kg = ppm；0.1wt% = 1000ppm
2. MDL = Method Detection Limit (方法偵測極限值)
3. n.d. = Not Detected (未檢出)；小於MDL / Less than MDL
4. "-" = Not Regulated (無規格值)
5. "---" = Not Conducted (未測試項目)
6. 全氟辛烷磺酸及其鹽類包含 (PFOS and its salts including)：
   CAS No.: 29081-56-9, 2795-39-3, 29457-72-5, 70225-14-8, 56773-42-3, 251099-16-8, 307-35-7.
7. 全氟辛酸及其鹽類包含 (PFOA and its salts including)：
   CAS No.: 3825-26-1, 335-95-5, 2395-00-8, 335-93-3, 335-66-0.
8. (#2) =
   a. 當六價鉻結果大於0.13 μg/cm²，表示樣品表層含有六價鉻。(The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13 μg/cm². The sample coating is considered to contain Cr(VI).)
   b. 當六價鉻結果為n.d. (濃度小於0.10 μg/cm²)，表示表層不含六價鉻。(The sample is negative for Cr(VI) if Cr(VI) is n.d. (concentration less than 0.10 μg/cm²). The coating is considered a non-Cr(VI) based coating)
   c. 當六價鉻結果介於 0.10 及 0.13 μg/cm² 時，無法確定塗層是否含有六價鉻。(The result between 0.10 μg/cm² and 0.13 μg/cm² is considered to be inconclusive - unavoidable coating variations may influence the determination.)
9. 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 sample(s) was/were analyzed on behalf of the applicant as mixing sample in one testing. The above result(s) was/were only given as the informality value.

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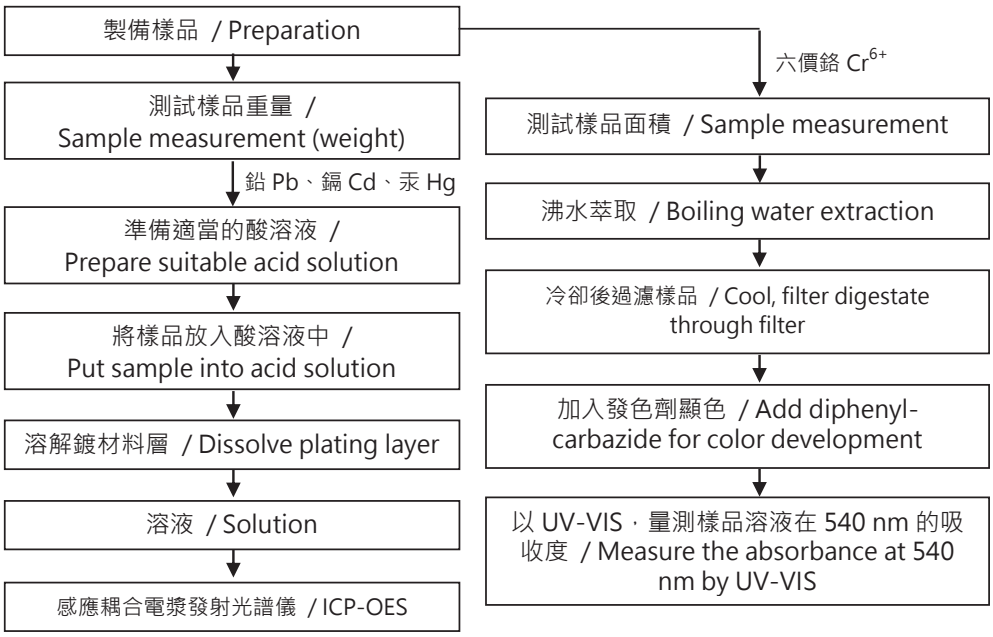
No.1

鍍層重金屬測試流程圖 / Flow Chart of Stripping method for metal analysis

根據以下的流程圖之條件，樣品之外部鍍層已完全溶解。(六價鉻測試方法除外) / The plating layer of samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr^{6+} test method excluded)



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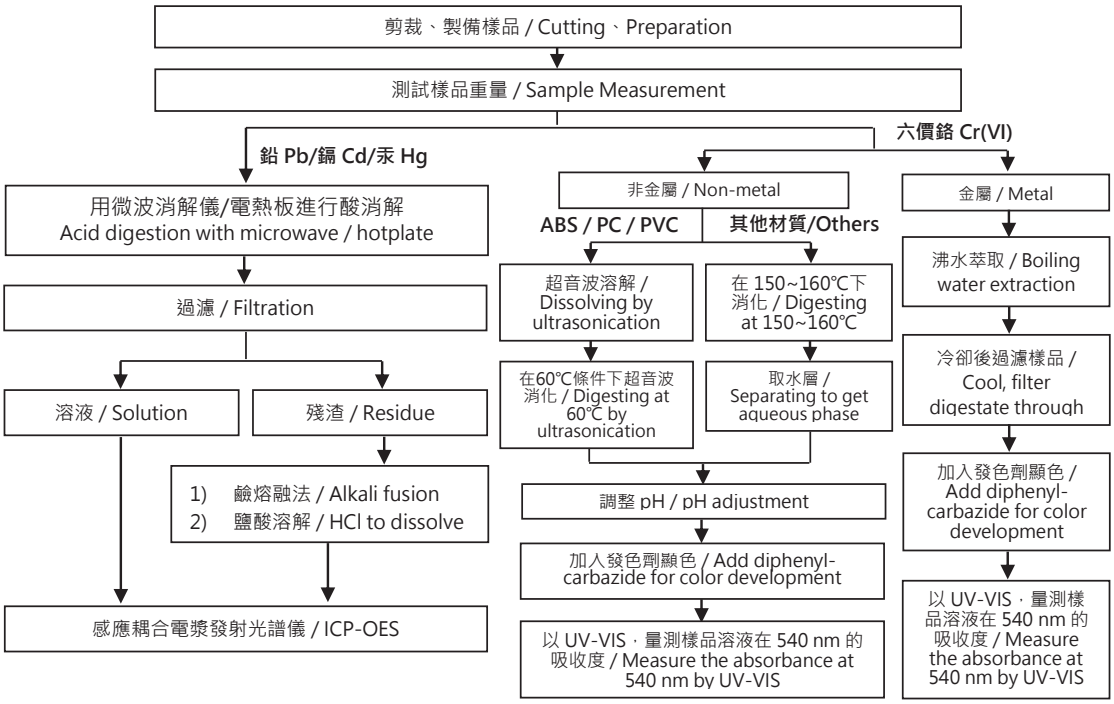
No.2, 4

重金屬流程圖 / Analytical flow chart of Heavy Metal

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.

（Cr^{6+} test method excluded）



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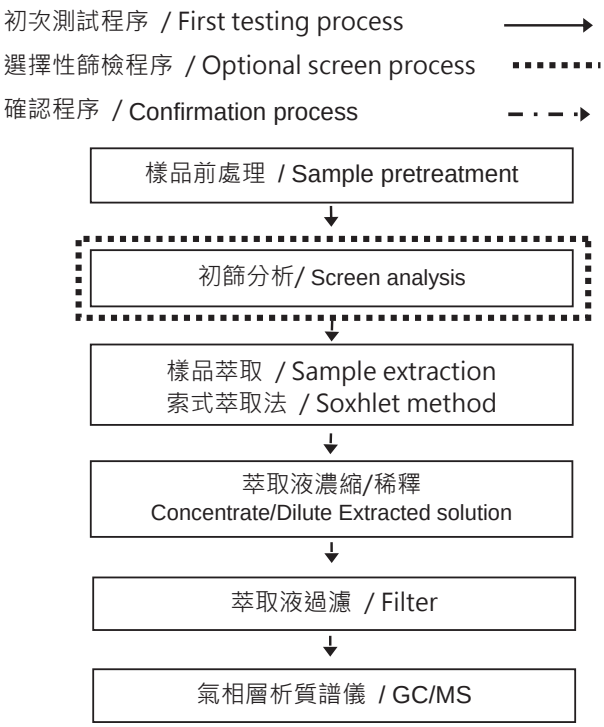
多溴聯苯/多溴聯苯醚分析流程圖 / Analytical flow chart - PBBs/PBDEs



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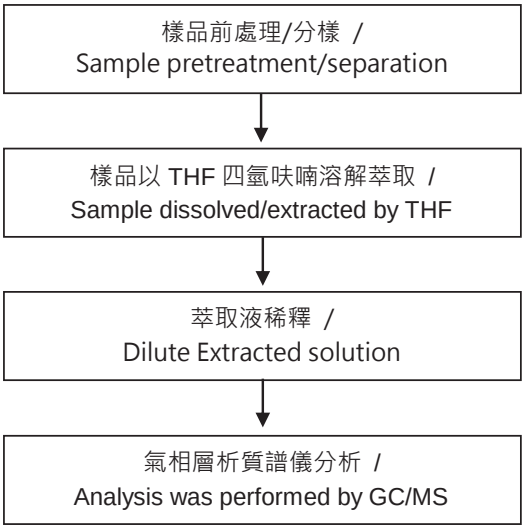
可塑劑分析流程圖 / Analytical flow chart - Phthalate

【測試方法/Test method: IEC 62321-8】



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六溴環十二烷分析流程圖 / Analytical flow chart - HBCDD

樣品前處理 / Sample pretreatment

↓

樣品萃取 Sample extraction /
超音波萃取法 Ultrasonic method

↓

萃取液濃縮/稀釋 /
Concentrate/Dilute Extracted solution

↓

萃取液過濾 / Filter

↓

以氣相層析/質譜儀分析 /
Analysis was performed by GC/MS

↓

數據 / Data

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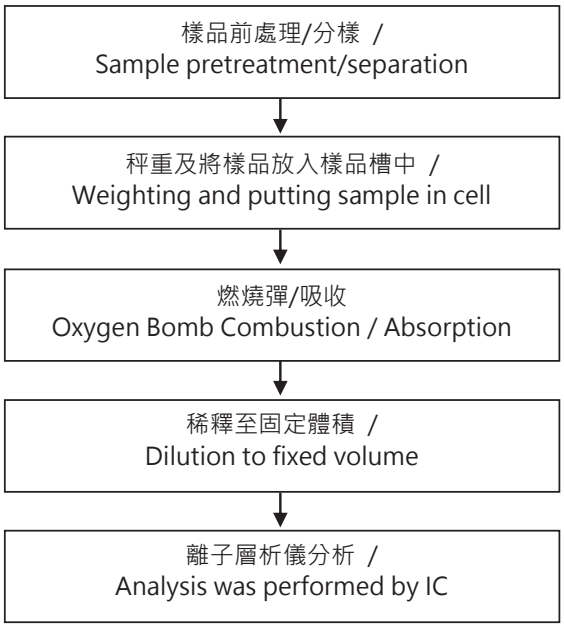
鹵素分析流程圖 / Analytical flow chart - Halogen



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全氟辛酸/全氟辛烷磺酸分析流程圖 / Analytical flow chart - PFOA/PFOS

樣品前處理 / Sample pretreatment

↓

超音波萃取法萃取 /
Sample extraction by Ultrasonic extraction

↓

萃取液稀釋/濃縮 /
Concentrate/Dilute Extracted solution

↓

以液相層析質譜儀或串聯質譜儀分析 /
Analysis was performed by LC/MS or LC/MS/MS

↓

數據 / Data

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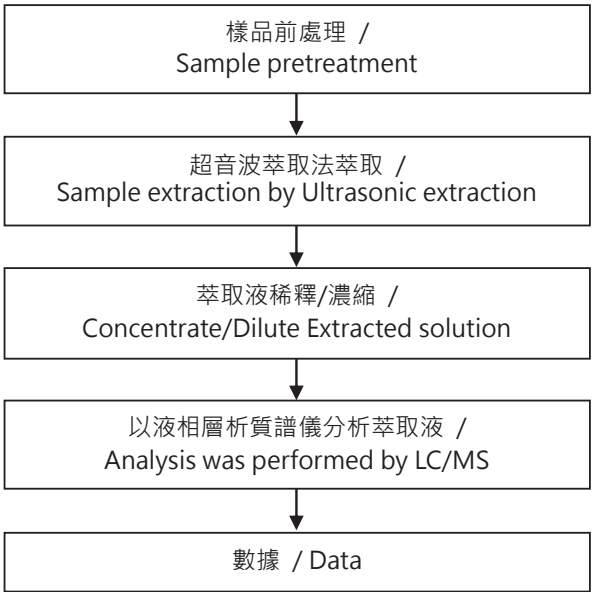
四溴雙酚-A 分析流程圖 / Analytical flow chart - TBBP-A



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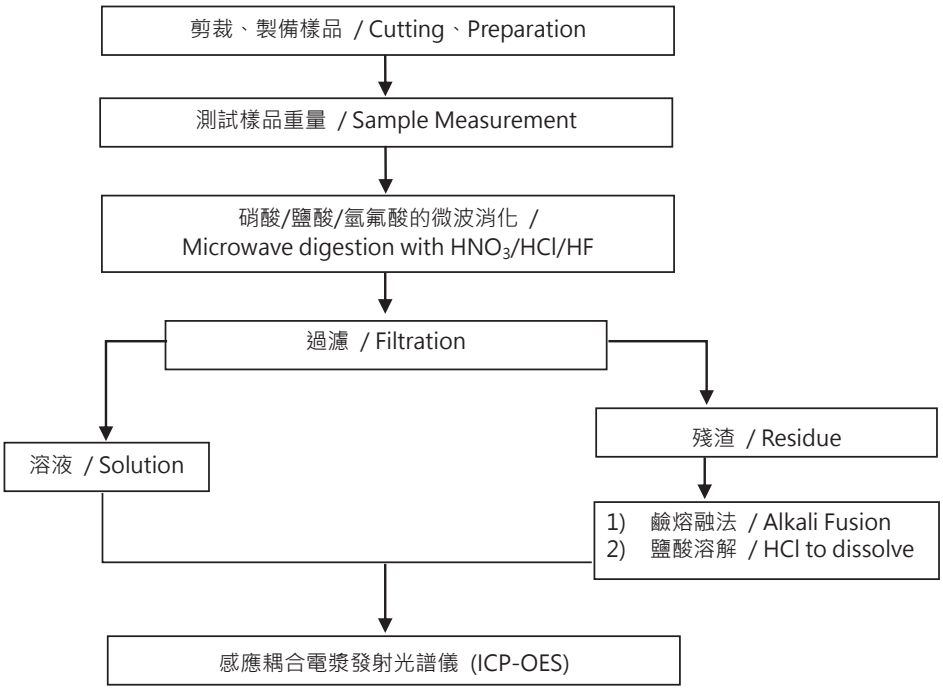
重金屬流程圖 / Analytical flow chart of Heavy Metal

根據以下的流程圖之條件，樣品已完全溶解。

These samples were dissolved totally by pre-conditioning method according to below flow chart.

【參考方法/Reference method：US EPA 3051、US EPA 3052】



* US EPA 3051 方法未添加氫氟酸 / US EPA 3051 method does not add HF.

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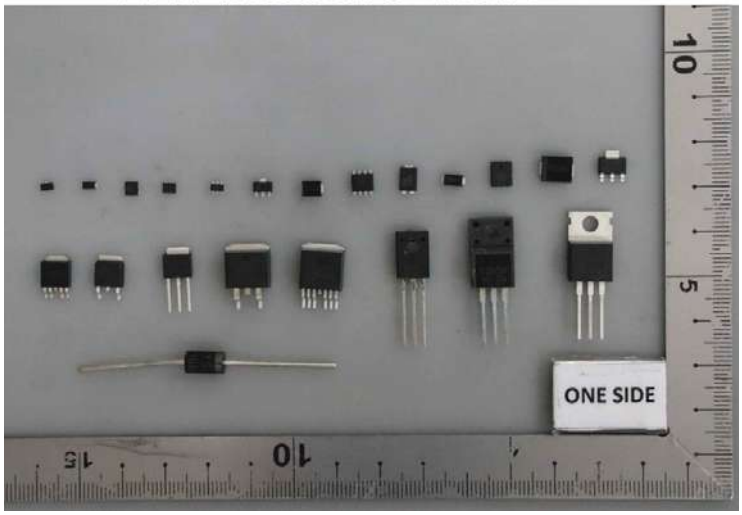
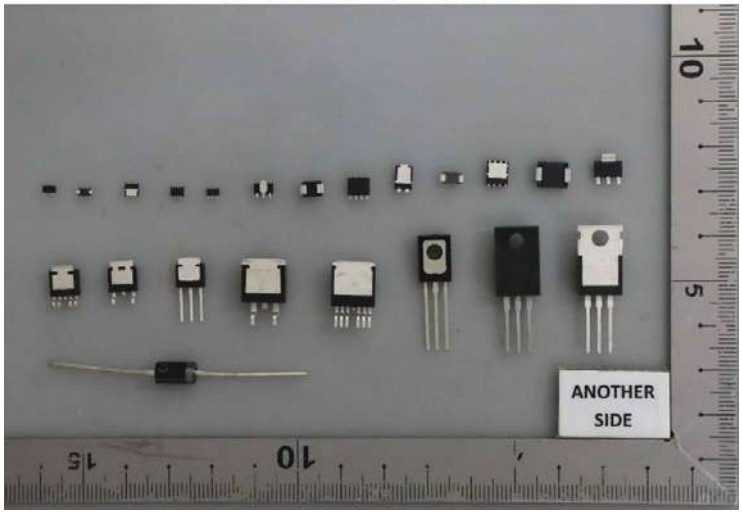
*** 照片中如有箭頭標示，則表示為實際檢測之樣品/部位. ***
(The tested sample / part is marked by an arrow if it's shown on the photo.)

ETR20C03576 NO.1



ETR20C03576 NO.1



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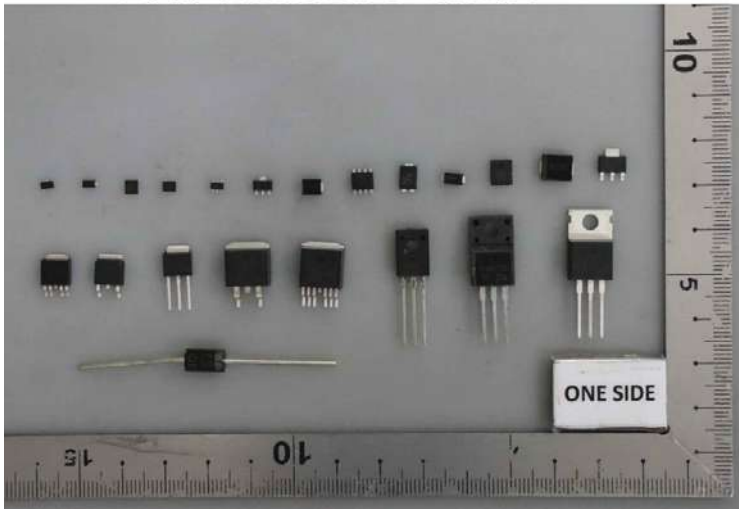
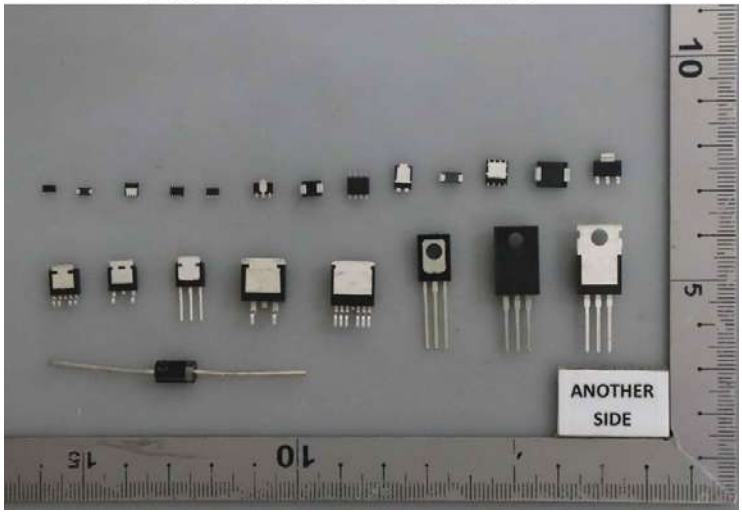
ETR20C03576 NO.2



ETR20C03576 NO.2



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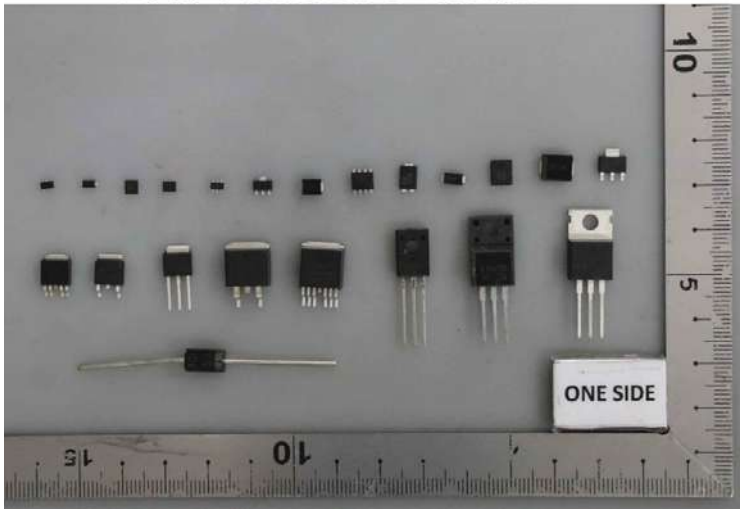
ETR20C03576 NO.3



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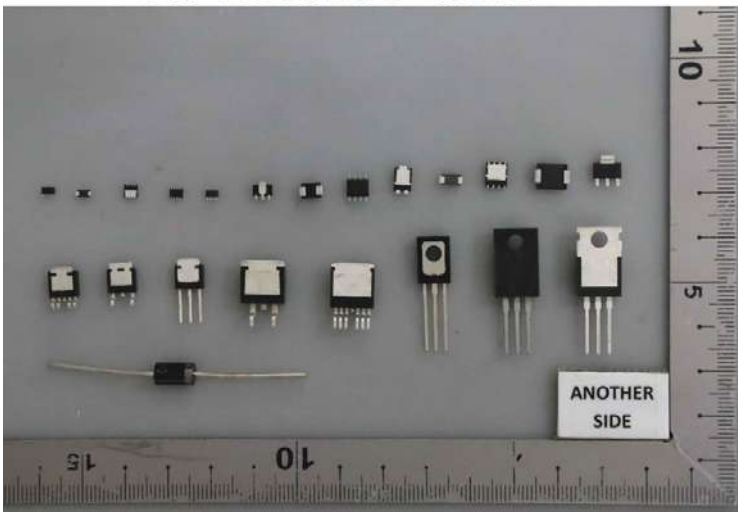

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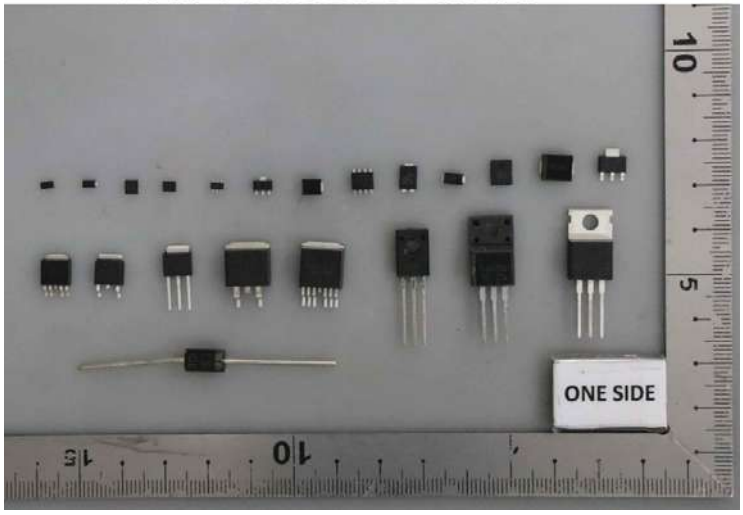
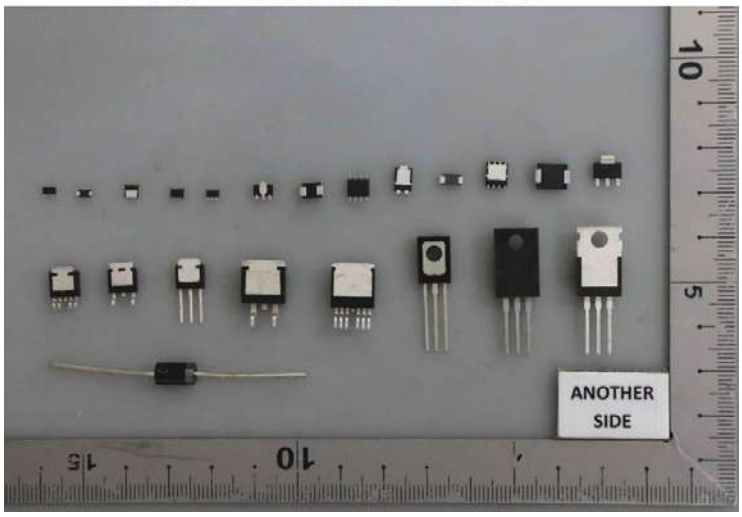
ETR20C03576 NO.4



ETR20C03576 NO.4



** 報告結尾 (End of Report) **

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全宇昕科技股份有限公司

CYStech Electronics Corp.

信賴性試驗報告

RELIABILITY TEST REPORT

Package :	**TO-263**
Part No.:	**MTE020N10RF3**
Document No :	**1803-028-1**
Date :	**2018/3/14**

制作	審核	核准
葉秀娥		

全宇昕科技股份有限公司

AUTHORIZED SIGNAUTRE

15F-7, No. 716, Chung Cheng Rd., Chung Ho City, Taipei Hsien, Taiwan, 235-52
(Far East Century Park. Building L) , Tel：+886-2-8227-3826 , Fax：+886-2-8227-3830,
http://www.cystek.com.tw

全宇昕科技股份有限公司

CYStech Electronics Corp.

信賴性試驗報告

RELIABILITY TEST REPORT

包裝別 Package:	TO-263	日期 Date :	2018/3/14
品名 Part no. :	MTE020N10RF3	文件編號 Document no. :	1803-028-1
數量 Q'ty:	330 PCS	製表者 Prepared by :	葉秀娥

試驗目的：新封裝評估實驗

一、試驗結果 Test Result :

試驗項目 Test Item	試驗條件 Test Condition	樣品數 Sample Size	試驗時間 Test Time hrs/cyc	累積實驗時間 CUM. Time hrs.	不良數 Failure Q'ty	FIT	MTTF (yr)	結果 Result	備註 Remark
高溫儲存試驗 (HTS) High Temp. Storage	Ta=175℃	77	1000hrs	77000	0	65.1	1752.8	ACC	
高溫高濕儲存試驗 (WHTS) Wet High Temp. Storage	Ta=85℃ , RH=85%	77	1000hrs	77000	0	1140.1	100.1	ACC	
壓力鍋試驗 (PCT) Pressure Cooker Test	Continuous storage Atmospheres Ta=121±2℃, P=15psig, RH=100%RH	77	168hrs	12936	0	309.7	368.6	ACC	
動作壽命試驗 (OPL) Operating Life Test	Ta=25℃,PD*max	22	1000hrs	22000	0	775.5	147.2	ACC	
冷熱衝擊試驗 (TST) Thermal Shock Test	5Minutes dwell time -65℃~175℃	77	200cys	2567	0	-	-	ACC	

二、結論 Conclusion : 以上試驗OK.

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MTE020N10RF3 電性CPK品質檢驗報告

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測試參數		BVDSS	VTH	+IGSS	-IGSS	IDSS	RDON	VFSD
參數條件		ID=250uA	ID=250uA	VGS=20V	VGS=-20V	VDS=80V	ID=20A VGS=10V	IS=20A
規格上限			4	100	100	1	30	1.2
規格下限		100	2					
		V	V	nA	nA	uA	mΩ	V
實測值	1	118.9	3.05	7.80	6.50	0.029	26.85	0.928
	2	119.0	3.10	4.90	6.90	0.029	25.82	0.927
	3	118.6	3.48	6.50	6.10	0.028	25.14	0.927
	4	118.4	3.36	6.10	5.80	0.027	26.05	0.928
	5	118.5	2.99	6.00	5.20	0.026	27.13	0.927
	6	118.6	2.95	5.00	6.00	0.027	26.02	0.926
	7	118.6	2.98	6.10	6.10	0.026	25.25	0.925
	8	118.7	2.99	5.90	5.30	0.028	24.96	0.925
	9	118.6	2.98	5.40	6.30	0.028	24.97	0.925
	10	118.6	3.04	6.50	6.50	0.028	24.82	0.925
	11	118.3	3.28	6.70	5.90	0.029	24.99	0.927
	12	118.4	3.10	6.40	6.30	0.028	24.91	0.926
	13	118.6	3.13	6.50	5.70	0.029	24.37	0.926
	14	118.6	3.32	5.30	6.90	0.029	24.30	0.925
	15	118.4	3.16	6.20	5.80	0.029	24.93	0.927
	16	118.8	3.43	6.60	6.70	0.029	25.68	0.927
	17	118.9	3.02	5.10	6.50	0.028	26.94	0.926
	18	118.9	2.98	5.90	5.70	0.028	26.02	0.925
	19	119.0	2.96	4.60	6.10	0.027	25.31	0.925
	20	118.9	3.01	4.60	6.10	0.026	25.21	0.924
	21	119.0	2.96	4.90	5.70	0.024	25.36	0.925
	22	119.0	2.97	5.70	6.10	0.024	25.98	0.925
	23	118.9	3.14	6.00	6.30	0.026	25.30	0.926
	24	119.0	3.49	5.30	6.00	0.027	24.97	0.927
	25	118.9	3.56	5.70	5.50	0.024	25.25	0.928
	26	118.8	3.35	5.70	5.50	0.024	25.56	0.928
	27	118.9	2.91	4.70	6.10	0.025	28.09	0.926
	28	119.0	2.93	4.80	6.00	0.026	27.15	0.928
	29	119.0	2.90	5.80	5.80	0.026	25.93	0.925
	30	119.0	2.96	5.70	6.20	0.026	25.63	0.926
	31	118.9	3.08	6.20	6.10	0.026	25.07	0.926
	32	118.9	3.29	5.60	5.70	0.025	25.04	0.928
	33	118.8	3.51	5.50	5.40	0.025	25.04	0.928
	34	118.7	3.60	5.60	5.40	0.025	25.32	0.929
	35	119.1	3.15	5.50	5.00	0.025	24.43	0.925
	36	119.1	3.05	5.60	6.10	0.025	24.62	0.924
	37	119.1	3.10	5.70	5.50	0.025	24.60	0.925
	38	119.0	3.25	5.80	6.00	0.026	24.55	0.924
	39	119.0	3.49	5.10	5.30	0.026	24.72	0.926
	40	118.9	3.51	5.30	5.70	0.026	25.06	0.926
	41	118.8	3.67	5.30	6.10	0.027	25.68	0.927
	42	119.0	3.40	5.10	6.10	0.027	24.91	0.926
	43	119.1	3.23	5.30	6.30	0.027	24.94	0.926
	44	119.0	3.26	5.50	6.00	0.025	24.92	0.926
	45	119.0	3.30	4.30	6.00	0.025	24.79	0.926
	46	118.9	3.33	4.30	5.80	0.024	24.75	0.926
	47	118.9	3.53	3.80	5.80	0.024	24.86	0.927
	48	118.8	3.57	4.40	5.60	0.024	25.25	0.928
	49	118.8	3.54	3.90	5.80	0.023	25.96	0.929
	50	118.8	3.43	4.20	5.90	0.024	25.71	0.929
MAX		119.10	3.67	7.80	6.90	0.029	28.09	0.929
MIN		118.30	2.90	3.80	5.00	0.023	24.30	0.924
X-bar		118.83	3.21	5.49	5.94	0.026	25.38	0.926
標準差		0.206	0.226	0.787	0.408	0.002	0.783	0.001