

File E231499
Project 02CA04580

November 1, 2002

REPORT

ON

COMPONENT - PRINTED WIRING

Real Time Focus Technology Corp.
Taoyuan Hsien, Taiwan

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ZPMV8.E231499
Wiring, Printed Certified for Canada - Component

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Wiring, Printed Certified for Canada - Component

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REAL TIME FOCUS TECHNOLOGY CORP

E231499

33 JINGJIAN 3RD RD


GUANYIN HSIANG

TAOYUAN HSIEN, 328 TAIWAN

	Cond Width		Cond	SS/ DSO	Max Area	Solder		Max Oper Temp	Meets UL796	C T	
	Min	Edge				Thk	DSO				Diam
Type	mm(in)	mm(in)	mic(mil)	DSO	mm(in)	C	sec	C	Class	DSR	I
Multilayer printed wiring boards.											
M-1	0.1 (0.004)	0.15 (0.006)	17 (0.67) Int:35	DS	90 (3.5)	288	10	130	V-0	All	*
M-3	0.37 (0.015)	0.47 (0.019)	103 (4.06) Int:206	DS	76.5 (3.0)	288	10	130	V-0	All	*
Single layer printed wiring boards.											
D-1	0.1 (0.004)	0.15 (0.006)	17 (0.67)	DS	90 (3.5)	288	10	130	V-0	All	*
D-3	0.37 (0.015)	0.47 (0.019)	103 (4.06)	DS	76.5 (3.0)	288	10	130	V-0	All	*

* - CTI marking is optional and may be marked on the printed wiring board.

Marking: Company name or tradename "RTF" , or file number and type designation and the Recognized Component

Mark for Canada,  . May be followed by a suffix to denote factory identification or burning test classification.
[Last Updated](#) on 2018-01-16

conductor limitations.

C

TABLE II - BASE MATERIALS

Type	Base Material &								Total Build-Up Thk. (mm)	Conductor Thk.# (mic)	PWB Mfg. Proc.	Meets UL 746E DSR	CTI V (PLC)
	Individual Laminate Matl.				Individual Bonding Sheet Matl.								
	UL/ANSI Grade	Mfr. +	Grade	Min. Thk. (mic)	UL/ANSI Grade	Mfr. +	Grade	Min. Thk. (mic)					
M-1	FR-4.0	NY	NP-140R [NY2]	70	FR-4.0	NY	NP-140B [NY2]	38	0.63	E:17 I:35	A	Yes	175 (3)
	FR-4.0	NY	NP-170R, NP-170TL, NP-170SR, NP-170STL	50	FR-4.0	NY	NP-170B, NP-170SB	50	0.63	E:17 I:35	A	Yes	100 (4)
	FR-4.0	S	SM-730R, SM-730M,	70	FR-4.0	S	SM-730B	50	0.63	E:17 I:35	A	Yes	175 (3)
	FR-4.0	HT	HTE-420	70	FR-4.0	HT	HTE-42B	50	0.63	E:17 I:35	A	Yes	175 (3)
	FR-4.0	IT	IT-140TC	70	FR-4.0	IT	IT-140BS	50	0.63	E:17 I:35	A	Yes	175 (3)
	FR-4.1	IT	IT-140GTC, IT-150GTC	100	FR-4.1	IT	IT-140GBS, IT-150GBS	50	0.63	E:17 I:35	A	Yes	100 (4)
	FR-4.0	IT	IT-180TC	50	FR-4.0	IT	IT-180BS	50	0.63	E:17 I:35	A	Yes	175 (3)
	FR-4.0	UP	UP-001, UP-TL, UP-001TC	100	FR-4.0	UP	UP-P, UP-001P, UP-001-PTC	50	0.63	E:17 I:35	A	Yes	175 (3)
	FR-4.0	IS	IS400 [I1]	50	FR-4.0	IS	IS400++ [I1]	50	0.63	E:17 I:35	A	Yes	175 (3)
	FR-4.0	IS	IS410, IS410BC, Ultra Ec 25	50	FR-4.0	IS	IS410++	50	0.63	E:17 I:35	A	Yes	175 (3)
	FR-4.0	PE	N4103-13-** [PE2]	50	FR-4.0	PE	N4203-13-** [PE2]	40	0.63	E:17 I:35	A1	Yes	175 (3)
	FR-4.0	IT	IT-180ATC	50	FR-4.0	IT	IT-180ABS	50	0.63	E:17 I:35	A	Yes	175 (3)

See following pages for foot note

TABLE II - BASE MATERIALS

Type	Base Material &								Total Build-Up Thk. (mm)	Conductor Thk.# (mic)	PWB Mfg. Proc.	Meets UL 746E DSR	CTI V (PLC)
	Individual Laminate Matl.				Individual Bonding Sheet Matl.								
	UL/ANSI Grade	Mfr. +	Grade	Min. Thk. (mic)	UL/ANSI Grade	Mfr. +	Grade	Min. Thk. (mic)					
M-1	FR-4.0	NY	NP-155R, NP-155TL, NP-175R, NP-175TL	50	FR-4.0	NY	NP-155B, NP-175B	50	0.63	E:17 I:35	A	Yes	175 (3)
	FR-4.0	TU	TU-752, TU-768 F, TU-768, TU-788	50	FR-4.0	TU	TU-75P, TU-768P F, TU-768P, TU-788P	50	0.63	E:17 I:35	A	Yes	75 (3)
	FR-4.0	VT	VT-41, VT-42, VT-45, VT-42S	70	FR-4.0	VT	VT-41PP, VT-42PP, VT-45PP, VT-42S PP	50	0.63	E:17 I:35	A	Yes	100 (4)
	FR-4.0	HT	HTE-570, HTE-760	50	FR-4.0	HT	HTE-57B, HTE-76B	50	0.63	E:17 I:35	A	Yes	100 (4)
	FR-4.0	HT	HTE-590-2, HTE-770	50	FR-4.0	HT	HTE-59B-2, HTE-77B	50	0.63	E:17 I:35	A	Yes	175 (3)
	FR-4.0	UP	UP-170TL, UP-170	100	FR-4.0	UP	UP-170B	50	0.63	E:17 I:35	A	Yes	175 (3)
	FR-4.0	E	EM-310, EM-320, EM-320 (5)	50	FR-4.0	E	EM-32B, EM-32B (5)	50	0.63	E:17 I:35	A	Yes	175 (3)
	FR-4.0	E	EM-827, EM-827 (E)	50	FR-4.0	E	EM-827B, EM-827B (E)	50	0.63	E:17 I:35	A	Yes	175 (3)
	FR-4.1	VT	VT-441, VT-441TC, VT-447, VT-447TC	50	FR-4.1	VT	VT-441PP, VT-447PP	50	0.63	E:17 I:35	A	Yes	175 (3)
	FR-4.0	HT	HTE-500, HTE-800	50	FR-4.0	HT	HTE-50B, HTE-80B	50	0.63	E:17 I:35	A	Yes	175 (3)

See following pages for foot note

TABLE II - BASE MATERIALS (CONT'D)

Type	Base Material &								Total Build- Up Thk. (mm)	Con- ductor Thk.# (mic)	PWB Mfg. Proc.	Meets UL 746E DSR	CTI V (PLC)
	Individual Laminate Matl.				Individual Bonding Sheet Matl.								
	UL/ ANSI Grade	Mfr. +	Grade	Min. Thk. (mic)	UL/ ANSI Grade	Mfr. +	Grade	Min. Thk. (mic)					
M-3	FR-4.0	IT	IT-140TC	70	FR-4.0	IT	IT-140BS	50	1.00	E:103~206 I:206	A	Yes	175 (3)
*	FR-4.0	UP	UP-001, UP-TL, UP-001TC	200	FR-4.0	UP	UP-P, UP-001P, UP-001-PTC	50	1.00	E:103~206 I:206	A	Yes	175 (3)
	FR-4.0	HT	HTE-420	200	FR-4.0	HT	HTE-420B	50	1.00	E:103~206 I:206	A	Yes	175 (3)
	FR-4.0	S	SM-730R, SM-730M	200	FR-4.0	S	SM-770B	50	1.00	E:103~206 I:206	A	Yes	175 (3)
	FR-4.0	HT	HTE-590- 2, HTE- 770	50	FR-4.0	HT	HTE-59B-2, HTE-77B	50	1.00	E:103~206 I:206	A	Yes	175 (3)
	FR-4.0	NY	NP-140R [NY2]	50	FR-4.0	NY	NP-140B [NY2]	38	1.00	E:103~206 I:206	A	Yes	175 (3)
M-5	FR-4.0	UP	UP-001, UP-TL, UP-001TC	200	FR-4.0	UP	UP-P, UP-001P, UP-001-PTC	50	0.63	E:103 I:103	A	Yes	175 (3)
*M6	FR-4.0	NY	NP-140R [NY2]	50	FR-4.0	NY	NP-140B [NY2]	38	0.32	E:17 I:34	A	Yes	175 (3)

See following pages for foot note

TABLE II - BASE MATERIALS (CONT'D)

Type	Base Material &								Total Build-Up Thk. (mm)	Conductor Thk.# (mic)	PWB Mfg. Proc.	Meets UL 746E DSR	CTI V (PLC)
	Individual Laminate Matl.				Individual Bonding Sheet Matl.								
	UL/ANSI Grade	Mfr. +	Grade	Min. Thk. (mic)	UL/ANSI Grade	Mfr. +	Grade	Min. Thk. (mic)					
M-11	FR-4.0	NY	NP-175FTL [NY1]	50	FR-4.0	NY	NP-175FB [NY1]	50	0.63	E: 17 I: 35	A	Yes	175 (3)
M-12	FR-4.0	VT	VT-41 [V1]	50	FR-4.0	VT	VT-41PP [V1]	50	0.63	E: 17 I: 35	A	Yes	100 (4)
	FR-4.0	VT	VT-42 [V2]	50	FR-4.0	VT	VT-42PP [V2]	50	0.63	E: 17 I: 35	A	Yes	175 (3)
M15	FR-4.0	ZH	H1170	75	FR-4.0	ZH	H1170P	75	0.38	E: 12 I: 35	A	Yes	175 (3)
	FR-4.0	ZH	H150 (LF), H150 (LF) Q	50	FR-4.0	ZH	H150P (LF), H150P (LF) Q	50	0.38	E: 12 I: 35	A	Yes	100 (4)
M-HF	FR-4.1	ZH	H140HF [ZH1]	50	FR-4.1	ZH	H140HFPP [ZH1]	50	0.63	E: 12 I: 35	A	Yes	600 (0)
	FR-4.1	TU	TU-862 HF [TU1]	50	FR-4.1	TU	TU-86P HF [TU1]	50	0.38	E: 12 I: 35	A	Yes	175 (3)
	FR-4.1	E	EM-370 [E1]	55	FR-4.1	E	EM-37B [E1]	50	0.15	E: 12 I: 35	A	Yes	175 (3)
	FR-4.1	E	EM-370 (D)	55	FR-4.1	E	EM-37B (D)	50	0.15	E: 12 I: 35	A	Yes	175 (3)
	FR-4.1	HT	HTE-650 [HT1]	50	FR-4.1	HT	HTE-65B [HT1]	50	0.15	E: 12 I: 35	A	Yes	250 (2)
RF1	-	TU	TU-883 [TU2]	50	-	TU	TU-883P [TU2]	50	0.38	E: 12 I: 70	A	Yes	175 (3)
RF2	-	R	RO4350B TM [R1]	100	-	R	RO4450B TM [R1]	90	0.50	E: 12 I: 34	A	Yes	600 (0)
RF3	-	TU	TU-933 [TU3]	50	-	TU	TU-933P [TU3]	50	0.38	E: 12 I: 70	A	Yes	175 (3)
RF4	<u>FR-4.0</u>	<u>IS</u>	<u>FR408HR</u>	<u>50</u>	<u>FR-4.0</u>	<u>IS</u>	<u>FR408HR++</u>	<u>50</u>	<u>0.38</u>	<u>E: 12</u> <u>I: 70</u>	<u>A</u>	<u>Yes</u>	<u>250 (2)</u>

See following pages for foot note

& - Recognized Component, (QMTS2)

+ - NY: Nan Ya (E98983); IT: Iteq (E178114); S: Shinemore (E199230); HT: Hong Tai (E188094); IS: Isola (E41625); UP: Uniplus (E166524); PE: Park Electrochemical (E36295); VT: Ventec (E214381); TU: Taiwan Union (E189572); E: ELITE (E150504); ZH: Zhejiang Huazheng (E136069); R: **ROGERS (E102763)**.

- I = Maximum internal thickness; E = Minimum external thickness.

- [I1] - Isola (E41625) IS400, PCL-FR-254, PCL-FR-370HR, Auto-HR, PCL-FR-370 Turbo, PCL-HP-850, PCL-FR-250HR, PCL-HP-870, 185HR/IS400++, PCL-FRP-254, PCL-FRP-370HR, PCL-FRP-370 Turbo, PCL-HPP-850, PCL-FRP-250HR, PCL-HPP-870, 185HR
- [NY1]- Nan Ya (E98983) NP-175FR, NP-175FTL, NP-155FR, NP-155FTL, NP-180FR, NP-180FTL, NP-175FMR, NP-175FMTL, NP-155FMR, NP-155FMTL/NP-175FB, NP-155FB, NP-180FB, NP-175FMB, NP-155FMB.
- [NY2]- Nan Ya (E98983) NP-140R, NP-140TL, NP-140MR, NP-140MTL/NP-140B, NP-140MB
- [PE2]- Park Electrochemical (E36295) N4103-13-**, N4^{^^}-13RF-**, N4103-13EP**/N4203-13-**, N4203-13EP**
** - May be followed by suffix "SI" denoting alternate glass type.
- [V1] - Ventec (E214381) VT-41, VT-41TC, VT-45, VT-45TC/VT-41PP, VT-45PP
- [V2] - Ventec (E214381) VT-42, VT-42TC, VT-42S/VT-42PP, VT-42S PP.
- [ZH1] - Zhejiang Huazheng (E136069) H140HF, H145HF, H150HF, H155HF, H160HF, H170HF, H175HF, H180HF, H185HF, H190HF, H200HF, H1600HF/ H140HFPP, H145HFPP, H150HFPP, H155HFPP, H160HFPP, H170HFPP, H175HF, H180HFPP, H185HFPP, H190HFPP, H200HFPP, H1600HFPP
- [TU1] - Taiwan Union (E189572) TU-862, TU-863, TU-862 HF, TU-862 LK, TU-862S, TU-742 HF, TU-742 MV, TU-747 HF, TU-747 LK, TU-747 HF (C), TU-865, TU-868, TU-815, TU-862T, TU-747T, TU-787 LK, TU-863+, TU-748, TU-788 LK/TU-86P, TU-863P, TU-86P HF, TU-86P LK, TU-862P S, TU-84P NF, TU-84P MF, TU-84P LF, TU-74P HF, TU-74P MV, TU-747P HF, TU-747P LK, TU-747P HF (C), TU-865P, TU-868P, TU-815P, TU-862P T, TU-747P T, TU-787P LK, TU-863P+, TU-748P, TU-788P LK
- [TU2] - Taiwan Union (E189572) TU-883, TU-883 Sp, TU-883A, TU-883A Sp, TU-883C, TU-883C Sp, TU-885, TU-901/TU-883P, TU-883P Sp, TU-883P A, TU-883P A Sp, TU-883P C, TU-883P C Sp, TU-885P, TU-901P
- [TU3] - **Taiwan Union (E189572) TU-933, TU-933B, TU-933E, TU-933+, TU-933D, TU-933A, TU-943, TU-933V, TU-933 (P2), TU-943E, TU-943N, TU-943R, TU-933+ (R), TU-933+ (Z)/ TU-933P, TU-933P B, TU-933P E, TU-933P+, TU-933P D, TU-933P A, TU-943P, TU-933P V, TU-933P (P2), TU-943P E, TU-943P N, TU-943P R, TU-933P+ (R), TU-933P+ (Z)**
- [E1] - ELITE (E150504) EM-370, EM-370 (Z), EM-370 (5)/ EM-37B, EM-37B (Z), EM-37B (L), EM-37B (5)
- [HT1] - Hong Tai (E188094) HTE-650, HTE-650-D, HTE-700/HTE-65B, HTE-65B-D, HTE-70B
- [R1] - **ROGERS (E102763) RO4350B™, RO4350B2™, RO4350B3™, RO4350D™/RO4450B™, RO4450F™**

Solder Resists

Types	Process	Solder Resists ^e
M-1	A	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 21, 22, 28
	A1	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 21, 22
M-3	A	2, 3, 4, 5, 6, 7, 8, 9, 12, 14, 17, 18, 19, 21, 22
M-5	A	20, 21, 22
M6	A	18, 19, 21, 22
M-11	A	8, 14, 22
M-12	A	23, 24, 25
M15	A	15, 18, 22
M-HF	A	14, 26, 27
RF1	A	14, 28
RF2	A	14, 28
RF3	A	14, 28
RF4	A	14, 28

@ - Solder Resist Grades (Recognized Component, QMJU2):

No.	Solder Resists		
	Manufacturer	Grade	File Number
1.	Chung-Yu	ZSR-150/ZSH-3 (ALL)	E112960
2.	Taiyo	S-502AA/HD-B (GN)	E69262
3.	Taiyo	S-502AB/HD-A (GN)	E69262
4.	Tamura	DSR-2200K/CA-2200K (GN, BL)	E67710
5.	Tamura	DSR-2200KG/CA-2200KG (GN)	E67710
6.	Tamura	DSR-2200NK/CA-2200NK (BL, RD, GN, YL)	E67710
7.	Tamura	DSR-2200NC/CA-2200NC (CL, BL, YL)	E67710
8.	Tamura	DSR-2200TL/CA-2200TL (GN, BK, BL, RD, YL WT)	E67710
9.	Tamura	DSR-2200TS01/CA-2200TS01 (GN, BL, RD)	E67710
10.	Tamura	DSR-2200TS11/CA-2200TS06 (GN)	E67710
11.	Tamura	DSR-2200TS13/CA-2200TS01 (BK)	E67710
12.	Tamura	DSR-2200TS25/CA-2200TS01 (GN)	E67710
13.	Tamura	DSR-2200TS05/CA-2200TS05 (AL, OR)	E67710
14.	Onstatic	R-500/HD-5 (ALL)	E208670
15.	Taiyo	PSR-2000AV/CA-25AV (GN)	E69262
16.	Taiyo	PSR-2000AN/CA-25AA (GN, RD, BL, YL)	E69262
17.	Taiyo	PSR-4000CE/CA-40CE (GN)	E69262
18.	Advance	PSR-550B/LS-55B (ALL)	E210858
19.	Advance	SR-6000/CA-60 (ALL)	E210858
20.	Taiyo	PSR-4000MP/CA-40MP (GN)	E69262
21.	Taiyo	PSR-4000DE/CA-40DE (GN, BK, BL)	E69262
22.	Taiyo	PSR-2000BK/CA-25BK (GN)	E69262
23.	Taiyo	PSR-4000JB/CA-40JB (WT)	E69262
24.	Taiyo	PSR-4000JN/CA-40JN (WT)	E69262
25.	Taiyo	PSR-4000JD/CA-40JD (WT)	E69262
26.	Taiyo	PSR-2000BA/CA-25AX (GN)	E69262
27.	Taiyo	PSR-2000BJ/CA-25BJ (GN)	E69262
28.	Nan Ya	LP-4G/HP-25D (ALL)	E123174

TABLE II - BASE MATERIALS

Type	Base Material &			Min. Thk. (mm)	Min. Copper Thk. (mics)	SS/ DS [®]	PWB Mfg. Process	Meets UL 746E DSR	CTI V (PLC)
	UL/ ANSI Grade	Mfr +	Grade						
D-1	CEM-1	NY	CEM-1-87, UV Block CEM-1-87	0.63	17	DS	B	Yes	175 (3)
	FR-4	NY	FR-4-86, UV Block FR-4-86	0.63	17	DS	B	Yes	175 (3)
	FR-4	JL	LS-4Y	0.63	17	DS	B	Yes	175 (3)
	FR-4	UP	UP-L, UP-LTC	0.63	17	DS	B	Yes	175 (3)
	FR-4	NY	NP-170R, NP-170TL, NP-170SR, NP-170STL	0.63	17	DS	B	Yes	100 (4)
	FR-4	S	SM-730R, SM-730M	0.63	17	DS	B	Yes	175 (3)
	FR-4	IT	IT-140GTC, IT-150GTC	0.63	17	DS	B	Yes	175 (3)
	CEM-1	CC	CCP-508	0.63	17	DS	B	Yes	600 (0)
	FR-4	IS	IS400 [I1]	0.63	17	DS	B	Yes	175 (3)
	FR-4	IS	IS410, IS410BC, Ultra Ec 25	0.63	17	DS	B	Yes	175 (3)
	FR-4	PE	N4103-13-** [PE1]	0.63	17	DS	B1	Yes	175 (3)
	FR-4	IT	IT-180ATC	0.63	17	DS	B	Yes	175 (3)
	CEM-3	NY	UV Block CEM-3-92, CEM-3-92	0.63	17	DS	B	Yes	175 (3)
	FR-4	NY	NP-155R, NP-155TL, NP-175R, NP-175TL	0.63	17	DS	B	Yes	175 (3)
	FR-4	TU	TU-752, TU-768 F, TU-768, TU-788	0.63	17	DS	B	Yes	175 (3)

See page 5B for footnotes.

TABLE II - BASE MATERIALS (CONT'D)

Type	Base Material &			Min. Thk. (mm)	Min. Copper Thk. (mics)	SS/ DS ^e	PWB Mfg. Process	Meets UL 746E DSR	CTI V (PLC)
	UL/ ANSI Grade	Mfr +	Grade						
D-1	FR-4.0	VT	VT-45, VT-42S, VT-41, VT-42, VT-41RD, VT-42RD, VT-45RD	0.63	17	DS	B	Yes	100 (4)
	FR-4.0	ZH	H140A	0.63	17	DS	B	Yes	175 (3)
	FR-4.0	HT	HTE-570, HTE-760	0.63	17	DS	B	Yes	100 (4)
	FR-4.0	HT	HTE-590-2, HTE-770	0.63	17	DS	B	Yes	175 (3)
	FR-4.0	UP	UP-170TL, UP-170	0.63	17	DS	B	Yes	175 (3)
	FR-4.0	E	EM-310, EM-320, EM-320 (5)	0.63	17	DS	B	Yes	175 (3)
	FR-4.0	E	EM-827, EM-827 (E)	0.63	17	DS	B	Yes	175 (3)
	FR-4.0	IT	IT-180TC	0.63	17	DS	B	Yes	175 (3)
	FR-4.0	HT	HTE-500, HTE-800	0.63	17	DS	B	Yes	175 (3)
D-3	FR-4.0	IT	IT-140TC	1.00	103~206	DS	B	Yes	175 (3)
	FR-4.0	UP	UP-L, UP-LTC	1.00	103~206	DS	B	Yes	175 (3)
	FR-4.0	HT	HTE-420	1.00	103~206	DS	B	Yes	175 (3)
	FR-4.0	S	SM-730R, SM-730M	1.00	103~206	DS	B	Yes	175 (3)
	FR-4.0	HT	HTE-590-2, HTE-770	1.00	103~206	DS	B	Yes	175 (3)
	FR-4.0	ZH	H140A	1.00	103~206	DS	B	Yes	175 (3)
	FR-4.0	NY	NP-140R [NY2]	1.00	103~206	DS	B	Yes	175 (3)

*

See page 5B for footnotes.

TABLE II - BASE MATERIALS (CONT'D)

Type	Base Material &			Min. Thk. (mm)	Min. Copper Thk. (mics)	SS/ DS ^e	PWB Mfg. Process	Meets UL 746E DSR	CTI V (PLC)
	UL/ ANSI Grade	Mfr +	Grade						
D6	FR-4.0	NY	NP-140R [NY2]	0.08	E:17	DS	B	-	175 (3)
D-11	FR-4.0	NY	NP-175FTL [NY1]	0.63	E:17	DS	B	Yes	175 (3)
D-12	FR-4.0	VT	VT-41 [V1]	0.63	E:17	DS	B	Yes	100 (4)
	FR-4.0	VT	VT-42 [V2]	0.63	E:17	DS	B	Yes	175 (3)
D15	FR-4.0	ZH	H1170	0.38	12	DS	B	Yes	175 (3)
	FR-4.0	ZH	H150 (LF) , H150 (LF) Q	0.38	12	DS	B	Yes	100 (4)
D-HF	FR-4.1	ZH	H140HF [ZH1]	0.63	12	DS	B	Yes	600 (0)
	FR-4.1	TU	TU-862 HF [TU1]	0.38	12	DS	B	Yes	175 (3)
	FR-4.1	E	EM-370 [E1]	0.15	12	DS	B	Yes	175 (3)
	FR-4.1	E	EM-370 (D)	0.15	12	DS	B	Yes	175 (3)
	FR-4.1	HT	HTE-650 [HT1]	0.15	12	DS	B	Yes	250 (2)

See page 5B for footnotes.

& - Recognized Component, (QMTS2)
 @ - SS - Single Sided; DS - Double Sided or Single Sided
 + - NY: Nan Ya (E98983); JL: Jiangsu Lianxin (E176891);
 CC: Chang Chun (E108591); UP: Uniplus (E166524); IT: Iteq (E178114);
 S: Shinemore (E199230); PE: Park Electrochemical (E36295); TU: Taiwan
 Union (E189572); VT: Ventec (E214381); ZH: Zhejiang Huazheng New Material
 CO LTD (E136069); HT: Hong Tai (E188094); E: ELITE (E150504); IS: Isola
 (E41625); ZH: Zhejiang Huazheng (E136069).
 # - E: Minimum external thickness

[I1] Isola (E41625) IS400, PCL-FR-254, PCL-FR-370HR, Auto-HR, PCL-FR-370
 Turbo, PCL-HP-850, PCL-FR-250HR, PCL-HP-870, 185HR.
 [PE1] Park Electrochemical (E36295) N4103-13-**, N4^^-13RF-**, N4103-13EP**
 ** - May be followed by suffix "SI" denoting alternate glass type.
 [NY1] Nan Ya (E98983) NP-175FR, NP-175FTL, NP-155FR, NP-155FTL, NP-180FR,
 NP-180FTL, NP-175FMR, NP-175FMTL, NP-155FMR, NP-155FMTL
 [NY2] Nan Ya (E98983) NP-140R, NP-140TL, NP-140MR, NP-140MTL
 [V1] Ventec (E214381) VT-41, VT-41TC, VT-45, VT-45TC
 [V2] Ventec (E214381) VT-42, VT-42TC, VT-42S
 [ZH1] **Zhejiang Huazheng (E136069) H140HF, H145HF, H150HF, H155HF, H160HF,
 - H170HF, H175HF, H180HF, H185HF, H190HF, H200HF, H1600HF**
 [TU1] **Taiwan Union (E189572) TU-862, TU-863, TU-862 HF, TU-862 LK, TU-862S,
 - TU-742 HF, TU-742 MV, TU-747 HF, TU-747 LK, TU-747 HF (C), TU-865, TU-
 - 868, TU-815, TU-862T, TU-747T, TU-787 LK, TU-863+, TU-748, TU-788 LK**
 [E1] - **ELITE (E150504) EM-370, EM-370(Z), EM-370(5)**
 [HT1] **Hong Tai (E188094) HTE-650, HTE-650-D, HTE-700**
 -

SOLDER RESISTS

Types	Process	Solder Resists [®]
D-1	B	2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 27
	B1	2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21
D-3	B	1, 2, 3, 4, 5, 6, 7, 8, 9, 12, 14, 17, 18, 19, 20, 21
D6	B	18, 19
D-11	B	8, 14, 21
D-12	B	22, 23, 24
D15	B	15, 18, 21
D-HF	B	14, 25, 26

@ - Solder Resist Grades (Recognized Component, QMJU2):

No.	Solder Resists		
	Manufacturer	Grade	File Number
1.	Chung-Yu	ZSR-150/ZSH-3 (ALL)	E112960
2.	Taiyo	S-502AA/HD-B (GN)	E69262
3.	Taiyo	S-502AB/HD-A (GN)	E69262
4.	Tamura	DSR-2200K/CA-2200K (GN, BL)	E67710
5.	Tamura	DSR-2200KG/CA-2200KG (GN)	E67710
6.	Tamura	DSR-2200NK/CA-2200NK (BL, RD, GN, YL)	E67710
7.	Tamura	DSR-2200NC/CA-2200NC (CL, BL, YL)	E67710
8.	Tamura	DSR-2200TL/CA-2200TL (GN, BK, BL, RD, YL, WT)	E67710
9.	Tamura	DSR-2200TS01/CA-2200TS01 (GN, BL, RD)	E67710
10.	Tamura	DSR-2200TS11/CA-2200TS06 (GN)	E67710
11.	Tamura	DSR-2200TS13/CA-2200TS01 (BK)	E67710
12.	Tamura	DSR-2200TS25/CA-2200TS01 (GN)	E67710
13.	Tamura	DSR-2200TS05/CA-2200TS05 (AL, OR)	E67710
14.	Onstatic	R-500/HD-5 (ALL)	E208670
15.	Taiyo	PSR-2000AV/CA-25AV (GN)	E69262
16.	Taiyo	PSR-2000AN/CA-25AA (GN, RD, BL, YL)	E69262
17.	Taiyo	PSR-4000CE/CA-40CE (GN)	E69262
18.	Advance	PSR-550B/LS-55B (ALL)	E210858
19.	Advance	SR-6000/CA-60 (ALL)	E210858
20.	Taiyo	PSR-4000DE/CA-40DE (GN, BK, BL)	E69262
21.	Taiyo	PSR-2000BK/CA-25BK (GN)	E69262
22.	Taiyo	PSR-4000JB/CA-40JB (WT)	E69262
23.	Taiyo	PSR-4000JN/CA-40JN (WT)	E69262
24.	Taiyo	PSR-4000JD/CA-40JD (WT)	E69262
25.	Taiyo	PSR-2000BA/CA-25AX (GN)	E69262
26.	Taiyo	PSR-2000BJ/CA-25BJ (GN)	E69262
27.	Nan Ya	LP-4G/HP-25D (ALL)	E123174

TABLE II - BASE MATERIALS

Type	Base Material &							Min. Copper Thk. (mic)	SS / DS _e	PWB Mfg. Process	Meets UL 746E DSR	CTI (PLC)
	UL/ANSI Grade	Mfr +	Grade	Metal Base Dielectric Thk		Metal Substrate						
				Min (mic)	Max (mic)	Type	Min Thk (mic)					
D8	-	E	EM-MP	50	250	Aluminum	300	17	SS	C	-	0
D88	-	ZW	HA80, HA81, HA82, HA83, HA84, HA85	75	150	Aluminum	700	17	SS	C	Yes	0
D9	-	E	EM-M1, EM-M1 (20)	75	250	Aluminum	500	30	SS	C	Yes	0
D-96	-	V	VT-4A2H	75	75	Aluminum	500	35	SS	C	Yes	2
D-98	-	V	VT-4B*, VT-4B3S	50	200	Aluminum	500	17	SS	C	-	0
D-99	-	C	CS89P, CS89C, CS-AL-89, CS88P, CS88C, CS-AL-88	80	100	Aluminum	600	34	DS _g	D	-	-

& - Recognized Component, (QMTS2)

@ - SS - Single Sided; DS - Double Sided or Single Sided

+ - E: Elite (E150504); C: Chin-Shi (E206580); V: Ventec (E214381).

% - See file E231499, report dated: 2016-08-03 for unlisted double sided construction.

SOLDER RESISTS

Types	Process	Solder Resists [@]
D8	C	1, 2
D88	C	3, 4
D9	C	1, 2
D-96	C	3, 4
D-98	C	3, 4

@ - Solder Resist and Hole Plugging Grades (Recognized Component, QMJU2):

No.	Solder Resist		
	Manufacturer	Grade	File Number
1.	Advance	PSR-550B/LS-55B (ALL)	E210858
2.	Advance	SR-6000/CA-60 (ALL)	E210858
3.	Taiyo	PSR-4000JN/CA-40JN (WT)	E69262
4.	Taiyo	PSR-4000JB/CA-40JB (WT)	E69262

SOLDER RESISTS

Types	Process	Solder Resists [@]
D-99	D	1, 2

HOLE PLUGGING/SOLDER RESIST COMBINATIONS

Types	Process	Hole Plugging Material/ Solder Resist [@]
D-99	D	A/1, A/2

@ - Solder Resist and Hole Plugging Grades (Recognized Component, QMJU2):

No.	Hole Plugging		
	Manufacturer	Grade	File Number
A.	San-Ei	PHP-900 IR-6P, PHP-900 IR-6PW, PHP-900 IR-6PS or PHP-900 IR-6PSL (WT)	E70678

No.	Solder Resist		
	Manufacturer	Grade	File Number
1.	Taiyo	PSR-4000JN/CA-40JN (WT)	E69262
2.	Taiyo	PSR-4000JB/CA-40JB (WT)	E69262