

Radial Lead Type

Series : **EB** Type : **A**



Features

- Endurance : +105 °C 5000 h to 10000 h
- High ripple high frequency (High Voltage)
- RoHS compliant

Specifications

Category temperature range	-40 °C to +105 °C	-25 °C to +105 °C
Rated voltage range	10 V.DC to 63 V.DC	160 V.DC to 450 V.DC
Capacitance range	2.2 μF to 3300 μF	10 μF to 330 μF
Capacitance tolerance	±20 % (120 Hz/+20 °C)	
Leakage current	I < 0.01 CV or 3 (μA) After 2 minutes (Whichever is greater)	I < 0.06 CV + 10 (μA) After 2 minutes
Dissipation factor (tan d)	Please see the attached characteristics list	
Endurance	After following life test with DC voltage and +105 °C±2 °C ripple current value applied (The sum of DC and ripple peak voltage shall not exceed the rated working voltage), when the capacitors are restored to 20 °C, the capacitors shall meet the limits specified below.	
	(10 V.DC to 63 V.DC) Duration : 05×11 to 08×11.5 : 5000 hours 08×15 to 012.5×25 : 10000 hours	
	Capacitance change	Within ±30 % of the initial value
	tan d	< 300 % of the initial limit
	DC leakage current	Within the initial limit
	(160 V.DC to 450 V.DC) Duration : 5000 hours	
Shelf life	Capacitance change	Within ±20 % of the initial value
	tan d	< 200 % of the initial limit
	DC leakage current	Within the initial limit
Shelf life	After storage for 1000 hours at +105 °C±2 °C with no voltage applied and then being stabilized at +20 °C, capacitors shall meet the limits specified in Endurance. (With voltage treatment)	

Frequency correction factor for ripple current

(10 V.DC ~ 63 V.DC)

Capacitance (μF)	Frequency (Hz)				
	60	120	1 k	10 k	100 k
2.2 to 10	0.75	1.00	1.40	1.55	1.65
22 to 470	0.85	1.00	1.20	1.25	1.30
1000 to 3300	0.95	1.00	1.05	1.10	1.15

Rated voltage (V.DC)	Frequency (Hz)			
	120	1 k	10 k to 30k	30 k to 100k
160 to 250	0.55	0.85	0.90	1.00
350 to 450	0.50	0.80	0.90	1.00

Dimensions

(Unit : mm)

	5	6.3	8	10	12.5	16	18
OD	5	6.3	8	10	12.5	16	18
Od	0.5	0.5	0.6	0.6	0.6	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5

Characteristics list

Endurance : 105 °C 05×11 to 08×11.5=5000 h, 08×15 to 012.5×25=10000 h

Rated voltage (V.DC)	Cap. (±20 %) (μF)	Case size (mm)		Specification			Lead length (mm)			Part No.	Min. Packaging Q'ty		
		OD	L	Ripple current (120 Hz) (+105 °C) (mA r.m.s.)	tan d (120 Hz) (+20 °C)	Endurance (hours)	Lead dia. Od	Lead space			Straight leads (pcs)	Taping (pcs)	
								Straight	Taping *B				Taping *H
10	100	5	11	66	0.30	5000	0.5	2.0	5.0	2.5	EEUEB1A101S()	200	2000
	220	6.3	11.2	100	0.30	5000	0.5	2.5	5.0	2.5	EEUEB1A221S()	200	2000
	470	8	15	278	0.30	10000	0.6	3.5	5.0		EEUEB1A471()	200	1000
		8	11.5	180	0.30	5000	0.6	3.5	5.0		EEUEB1A471S()	200	1000
	2200	12.5	20	540	0.32	10000	0.6	5.0	5.0		EEUEB1A222()	200	500
	3300	12.5	25	802	0.34	10000	0.6	5.0	5.0		EEUEB1A332()	200	500
16	1000	10	20	430	0.25	10000	0.6	5.0	5.0		EEUEB1C102()	200	500
	2200	12.5	25	706	0.27	10000	0.6	5.0	5.0		EEUEB1C222()	200	500
25	47	5	11	55	0.22	5000	0.5	2.0	5.0	2.5	EEUEB1E470S()	200	2000
	100	6.3	11.2	95	0.22	5000	0.5	2.5	5.0	2.5	EEUEB1E101S()	200	2000
	220	8	11.5	125	0.22	5000	0.6	3.5	5.0		EEUEB1E221S()	200	1000
	330	8	15	255	0.22	10000	0.6	3.5	5.0		EEUEB1E331()	200	1000
	470	10	16	321	0.22	10000	0.6	5.0	5.0		EEUEB1E471()	200	500
	1000	12.5	20	498	0.22	10000	0.6	5.0	5.0		EEUEB1E102()	200	500
35	33	5	11	46	0.18	5000	0.5	2.0	5.0	2.5	EEUEB1V330S()	200	2000
	220	8	15	197	0.18	10000	0.6	3.5	5.0		EEUEB1V221()	200	1000
	330	10	16	278	0.18	10000	0.6	5.0	5.0		EEUEB1V331()	200	500
	470	10	20	349	0.18	10000	0.6	5.0	5.0		EEUEB1V471()	200	500
	1000	12.5	25	586	0.18	10000	0.6	5.0	5.0		EEUEB1V102()	200	500
50	2.2	5	11	15	0.15	5000	0.5	2.0	5.0	2.5	EEUEB1H2R2S()	200	2000
	3.3	5	11	18	0.15	5000	0.5	2.0	5.0	2.5	EEUEB1H3R3S()	200	2000
	4.7	5	11	18	0.15	5000	0.5	2.0	5.0	2.5	EEUEB1H4R7S()	200	2000
	10	5	11	27	0.15	5000	0.5	2.0	5.0	2.5	EEUEB1H100S()	200	2000
	22	5	11	39	0.15	5000	0.5	2.0	5.0	2.5	EEUEB1H220S()	200	2000
	47	6.3	11.2	61	0.15	5000	0.5	2.5	5.0	2.5	EEUEB1H470S()	200	2000
	100	8	11.5	99	0.15	5000	0.6	3.5	5.0		EEUEB1H101S()	200	1000
	220	10	16	234	0.15	10000	0.6	5.0	5.0		EEUEB1H221()	200	500
	330	10	20	293	0.15	10000	0.6	5.0	5.0		EEUEB1H331()	200	500
470	12.5	20	370	0.15	10000	0.6	5.0	5.0		EEUEB1H471()	200	500	
63	2.2	5	11	16.5	0.12	5000	0.5	2.0	5.0	2.5	EEUEB1J2R2S()	200	2000
	3.3	5	11	20	0.12	5000	0.5	2.0	5.0	2.5	EEUEB1J3R3S()	200	2000
	4.7	5	11	23	0.12	5000	0.5	2.0	5.0	2.5	EEUEB1J4R7S()	200	2000
	10	5	11	30	0.12	5000	0.5	2.0	5.0	2.5	EEUEB1J100S()	200	2000
	22	6.3	11.2	40	0.12	5000	0.5	2.5	5.0	2.5	EEUEB1J220S()	200	2000
	33	6.3	11.2	50	0.12	5000	0.5	2.5	5.0	2.5	EEUEB1J330S()	200	2000
	47	8	15	94	0.12	10000	0.6	3.5	5.0		EEUEB1J470()	200	1000
		8	11.5	80	0.12	5000	0.6	3.5	5.0		EEUEB1J470S()	200	1000
	100	8	15	180	0.12	10000	0.6	3.5	5.0		EEUEB1J101()	200	1000
	220	10	20	292	0.12	10000	0.6	5.0	5.0		EEUEB1J221()	200	500
	330	12.5	20	381	0.12	10000	0.6	5.0	5.0		EEUEB1J331()	200	500
	470	12.5	25	454	0.12	10000	0.6	5.0	5.0		EEUEB1J471()	200	500

· When requesting taped product, please put the letter "B" or "H" between the "()". Lead wire pitch *B=5 mm, 7.5 mm, H=2.5 mm.

· Please refer to the page of "Taping dimensions".

Characteristics list

Endurance : 105 °C 5000 h

Rated voltage (V.DC)	Cap. (±20 %) (μF)	Case size (mm)		Specification			Lead length (mm)			Part No.	Min. Packaging Q'ty		
		OD	L	Ripple current (120 Hz) (+105 °C) (mA r.m.s.)	tan d (120 Hz) (+20 °C)	Endurance (hours)	Lead dia. Od	Lead space			Straight leads (pcs)	Taping (pcs)	
								Straight	Taping *B				
160	22	10	20	470	0.15	5000	0.6	5.0	5.0	EEUEB2C220()	200	500	
	33	10	20	470	0.15	5000	0.6	5.0	5.0	EEUEB2C330()	200	500	
	47	12.5	20	600	0.15	5000	0.6	5.0	5.0	EEUEB2C470()	200	500	
	68	12.5	25	750	0.15	5000	0.6	5.0	5.0	EEUEB2C680()	200	500	
		16	20	750	0.15	5000	0.8	7.5	7.5	EEUEB2C680S()	100	250	
	100	16	25	1060	0.15	5000	0.8	7.5	7.5	EEUEB2C101()	100	250	
		18	20	1060	0.15	5000	0.8	7.5	7.5	EEUEB2C101S()	100	250	
	150	16	31.5	1280	0.15	5000	0.8	7.5	–	EEUEB2C151	100	–	
		18	25	1280	0.15	5000	0.8	7.5	7.5	EEUEB2C151S()	100	250	
	220	16	31.5	1280	0.15	5000	0.8	7.5	–	EEUEB2C221	100	–	
		18	25	1280	0.15	5000	0.8	7.5	7.5	EEUEB2C221S()	100	250	
	330	18	31.5	1690	0.15	5000	0.8	7.5	–	EEUEB2C331	50	–	
200	22	10	20	470	0.15	5000	0.6	5.0	5.0	EEUEB2D220()	200	500	
	33	12.5	20	600	0.15	5000	0.6	5.0	5.0	EEUEB2D330()	200	500	
	47	12.5	20	600	0.15	5000	0.6	5.0	5.0	EEUEB2D470()	200	500	
	68	12.5	25	750	0.15	5000	0.6	5.0	5.0	EEUEB2D680()	200	500	
		16	20	750	0.15	5000	0.8	7.5	7.5	EEUEB2D680S()	100	250	
	100	16	25	1060	0.15	5000	0.8	7.5	7.5	EEUEB2D101()	100	250	
		18	20	1060	0.15	5000	0.8	7.5	7.5	EEUEB2D101S()	100	250	
	150	16	31.5	1280	0.15	5000	0.8	7.5	–	EEUEB2D151	100	–	
		18	25	1280	0.15	5000	0.8	7.5	7.5	EEUEB2D151S()	100	250	
	220	18	31.5	1690	0.15	5000	0.8	7.5	–	EEUEB2D221	50	–	
	250	22	12.5	20	560	0.15	5000	0.6	5.0	5.0	EEUEB2E220()	200	500
		33	12.5	20	560	0.15	5000	0.6	5.0	5.0	EEUEB2E330()	200	500
47		12.5	25	710	0.15	5000	0.6	5.0	5.0	EEUEB2E470()	200	500	
		16	20	710	0.15	5000	0.8	7.5	7.5	EEUEB2E470S()	100	250	
68		16	25	990	0.15	5000	0.8	7.5	7.5	EEUEB2E680()	100	250	
		18	20	990	0.15	5000	0.8	7.5	7.5	EEUEB2E680S()	100	250	
100		16	31.5	1200	0.15	5000	0.8	7.5	–	EEUEB2E101	100	–	
		18	25	1200	0.15	5000	0.8	7.5	7.5	EEUEB2E101S()	100	250	
150		18	31.5	1470	0.15	5000	0.8	7.5	–	EEUEB2E151	50	–	
350		10	10	20	270	0.20	5000	0.6	5.0	5.0	EEUEB2V100()	200	500
		22	12.5	20	350	0.20	5000	0.6	5.0	5.0	EEUEB2V220()	200	500
		33	16	20	480	0.20	5000	0.8	7.5	7.5	EEUEB2V330S()	100	250
	16		25	640	0.20	5000	0.8	7.5	7.5	EEUEB2V470()	100	250	
	47	18	20	640	0.20	5000	0.8	7.5	7.5	EEUEB2V470S()	100	250	
		16	31.5	780	0.20	5000	0.8	7.5	–	EEUEB2V680	100	–	
	68	18	25	780	0.20	5000	0.8	7.5	7.5	EEUEB2V680S()	100	250	
		100	18	31.5	970	0.20	5000	0.8	7.5	–	EEUEB2V101	50	–
	400	10	10	20	250	0.24	5000	0.6	5.0	5.0	EEUEB2G100()	200	500
		22	12.5	25	410	0.24	5000	0.6	5.0	5.0	EEUEB2G220()	200	500
			16	20	410	0.24	5000	0.8	7.5	7.5	EEUEB2G220S()	100	250
		33	16	25	600	0.24	5000	0.8	7.5	7.5	EEUEB2G330()	100	250
18			20	600	0.24	5000	0.8	7.5	7.5	EEUEB2G330S()	100	250	
47		16	31.5	730	0.24	5000	0.8	7.5	–	EEUEB2G470	100	–	
		18	25	730	0.24	5000	0.8	7.5	7.5	EEUEB2G470S()	100	250	
450		10	12.5	20	310	0.24	5000	0.6	5.0	5.0	EEUEB2W100()	200	500
		22	16	25	560	0.24	5000	0.8	7.5	7.5	EEUEB2W220()	100	250
			18	20	560	0.24	5000	0.8	7.5	7.5	EEUEB2W220S()	100	250
		33	16	31.5	680	0.24	5000	0.8	7.5	–	EEUEB2W330()	100	–
			18	25	680	0.24	5000	0.8	7.5	7.5	EEUEB2W330S()	100	250
	47	18	31.5	850	0.24	5000	0.8	7.5	–	EEUEB2W470	50	–	

· When requesting taped product, please put the letter "B" between the "()". Lead wire pitch *B=5 mm, 7.5 mm.

· Please refer to the page of "Taping dimensions".

***XiGHOiQHV DQG SUHFDXWiRQV UHJDUGiQJ WKH
WHFKQiFDO iQIRUPDWiRQ DQG XVH RI RXU SURGXFWV
GHVFUiEHG iQ WKiV RQOiQH FDWDORJ.**

- II \RX ZDQW WR XVH RXU SURGXFWV GHVFUiEHG iQ WKiV RQOiQH FDWDORJ IRU DSSOiFDWiRQV UHTXiUiQJ VSHFiDO TXDOiWiHV RU UHOiDEiOiW\, RU IRU DSSOiFDWiRQV ZKHUH WKH IDiOXUH RU PDOIXQFWiRQ RI WKH SURGXFWV PD\ GiUHFwO\ jHRSdUGi]H KXPdQ OiH RU SRWHQWiD00\ FDXVH SHUVRQDO iQjXU\ (H. J. DiUFUDIW DQG DHURVSDFH HTXiSPHQW, WUDIiF DQG WUDQVSRUWDWiRQ HTXiSPHQW, FRPEXVWiRQ HTXiSPHQW, PHGiFDO HTXiSPHQW, DFFiGHQW SUHYHQWiRQ, DQWi-FUiPH HTXiSPHQW, DQG/RU VDIHW\ HTXiSPHQW3, iW iV QHFHVVDU\ WR YHUiI\ ZKHWKHU WKH VSHFiLiFDWiRQV RI RXU SURGXFWV iW WR VXFk DSSOiFDWiRQV. 30HDVH HQVXUH WKDW \RX Zi00 DVN DQG FKHFN ZiWk RXU iQTXiu\ GHVN DV WR ZKHWKHU WKH VSHFiLiFDWiRQV RI RXU SURGXFWV iW WR VXFk DSSOiFDWiRQV XVH EHIRUH \RX XVH RXU SURGXFWV.
- 7KH TXDOiW\ DQG SHUIRUPDQFH RI RXU SURGXFWV DV GHVFUiEHG iQ WKiV RQOiQH FDWDORJ RQ0\ DSS0\ WR RXU SURGXFWV ZKHQ XVHG iQ iVRODWiRQ. 7KHUHIRUH, SOHDVH HQVXUH \RX HYDOXDWH DQG YHUiI\ RXU SURGXFWV XQGHU WKH VSHFiLiF FiUFXPVWDQFHV iQ ZKiFk RXU SURGXFWV DUH DVVHPEOHG iQ \RXU RZQ SURGXFWV DQG iQ ZKiFk RXU SURGXFWV Zi00 DFwXD00\ EH XVHG.
- II \RX XVH RXU SURGXFWV iQ HTXiSPHQW WKDW UHTXiUHV D KiJK GHJUHH RI UHOiDEiOiW\, UHJDUGOHVV RI WKH DSSOiFDWiRQ, iW iV UHFRPPHQGHG WKDW \RX VHW XS SURWHFWiRQ FiUFXiWV DQG UHGxQGdQF\ FiUFXiWV iQ RUGHU WR HQVXUH VDIHW\ RI \RXU HTXiSPHQW.
- 7KH SURGXFWV DQG SURGXFW VSHFiLiFDWiRQV GHVFUiEHG iQ WKiV RQOiQH FDWDORJ DUH VXEjHFw WR FKdQJH IRU iPSURYHPhQW ZiWKRw SUiRU QRWiFh. 7KHUHIRUH, SOHDVH EH VXUH WR UHTXHVW DQG FRQiUP WKH 0DWHVW SURGXFW VSHFiLiFDWiRQV ZKiFk H[SODiQ WKH VSHFiLiFDWiRQV RI RXU SURGXFWV iQ GHWDi0, EHIRUH \RX iQDOi]H WKH GHViJQ RI \RXU DSSOiFDWiRQV, SXUFKDVH, RU XVH RXU SURGXFWV.
- 7KH WHFKQiFDO iQIRUPDWiRQ iQ WKiV RQOiQH FDWDORJ SURYiGHV H[DPSOHV RI RXU SURGXFWV' W\SiFDO RSHUDWiRQV DQG DSSOiFDWiRQ FiUFXiWV. :H GR QRW JXDUDQWHH WKH QRQ-iQiUiQJHPHQW RI WKiUG SDUW\ 'V iQWHOOHFwXD0 SURSHUW\ UiJKWV DQG ZH GR QRW JUDQW DQ\ OiFHQVH, UiJKW, RU iQWHUHVVW iQ RXU iQWHOOHFwXD0 SURSHUW\.
- II DQ\ RI RXU SURGXFWV, SURGXFW VSHFiLiFDWiRQV DQG/RU WHFKQiFDO iQIRUPDWiRQ iQ WKiV RQOiQH FDWDORJ iV WR EH H[SRUWHG RU SURYiGHG WR QRQ-UHVIGHQWV, WKH ODZV DQG UHjXODWiRQV RI WKH H[SRUiQJ FRXQWU\, HVSHFiD00\ ZiWk UHJDUG WR VHFxUiW\ DQG H[SRUW FRQWURO, VKD00 EH REVHUYHG.

**<5HJDUGiQJ WKH &HUWiliFDWH RI &RPSOiDQFH ZiWk
WKH (8 5R+6 DiUHFWiYH/5 (\$&+ 5HjXODWiRQV !**

- 7KH VZiWFKRYHU GDWH IRU FRPSOiDQFH ZiWk WKH 5R+6 DiUHFWiYH/5 (\$&+ 5HjXODWiRQV YDUiHV GHSHQGiQJ RQ WKH SDUW QXPEHU RU VHUiHV RI RXU SURGXFWV.
- :KHQ \RX XVH WKH iQYHQWRU\ RI RXU SURGXFWV IRU ZKiFk iW iV XQFOHDU ZKHWKHU WKRvH SURGXFWV DUH FRPSOiDQW ZiWk WKH 5R+6 DiUHFWiYH/5 (\$&+ 5HjXODWiRQ, SOHDVH VHOHFw "6DOHV iQTXiu\" iQ WKH ZHEViWH iQTXiu\ IRUP DQG FRQWDFW XV.

= H GR QRW WDNH DQ\ UHVSROViEi0W\ IRU WKH XVH RI RXU SURGXFWV RXWViGH WKH VFRSH RI WKH VSHFiLiFDWiRQV, GHVFUiSWiRQV, jXiGHOiQHV DQG SUHFDXWiRQV GHVFUiEHG iQ WKiV RQOiQH FDWDORJ.

1RWiFHV

□ \$\$\$oIFDEOH 0DZV DQG UHJXODWiRQV

- 塘7KiV SURGXFW FRPSOIH ZiWK WKH 5R+6 DiUHFwiYH (5HVWUifwiRQ RI WKH XVH RI FHUWDiQ KD)DUGRXV VXEVWDQFHV iQ HOHFwUifDO DQG HOHFwURQiF HTXisPHQW (DI5(&7I9(2011/65/(8 DQG(832015/86333.
- 1R 2]RQH DHSOHwiQJ &KHPiFDOV(2D&'V3, FRQWUROOHG XQGHU WKH ORQUWUDO 3URWRFRQ \$JUHHPHQW, DUH XVHG iQ SURGXFiQJ WKiV SURGXFW.
: H GR QRW XVH 3%%V RU 3%D(V DV EURPiQDWHG IDPH UHWDUGDQWV.
 - ([SRUW SURFHGXUH ZKiFK IROORZHG H[SRUW UHODWHG UHJXODWiRQV, VXFK DV IRUHiJQ H[FKDQJH DQG D IRUHiJQ WUDGH PHWKRG, RQ WKH RFFDViRQ RI H[SRUW RI WKiV SURGXFW.
 - 7KHVH SURGXFWV DUH QRW GDQJHURXV JRRGV RQ WKH WUDQVSRUWDWiRQ DV iGHQWiIHG E\ 81(8QiWHG IDWiRQV3 QXPEHU RU 81 FODVViIfDwiRQ.

□ /iPiWHG DSSoIFDwiRQV

- 7KiV FDSDFiWRU iV GHViJQH WR EH XVHG IRU HOHFwURQiFV FiUFxiWV VXFK DV DXGiR/YiVXDO HTXisPHQW, KRPH DSSoIDQFHV, FRPSXWHUV DQG RWKHU RiIiFw HTXisPHQW, RSWiFDO HTXisPHQW, PHDVXUiQJ HTXisPHQW.
- 塘 +iJK UHOiDEiOiW\ DQG VDIHW\ DUH UHTXiUHG > EH / D SRVViEiOiW\ WKDW iQFRUHFw RSHUDWiRQ RI WKiV SURGXFW P\ GR KDUP WR D KXPdq OiH RU SURSHUW\ @ PRUH. :KHQ XVH iV FRQViGHUHG E\ WKH XVH, WKH GHoiYHU\ VSHFiIfDwiRQV ZKiFK VXiWHG WKH XVH VHSdUDWHO\ QHHG WR EH H[FKDQJHG.

□ IQWHOHFwXDO SURSHUW\ UiJKWV DQG OiFHQVHV

- 7KH WHFKQiFDO iQIRUPDwiRQ iQ WKiV VSHFiIfDwiRQ SURYiGHV H[DPSOHV RI RXU SURGXFWV' W\SiFDO RSHUDWiRQV DQG DSSoIFDwiRQ FiUFxiWV. :H GR QRW JXDUDQWHH WKH QRQ-iQiUiQJHPHQW RI WKiUG SDUW\iV iQWHOHFwXDO SURSHUW\ UiJKWV DQG ZH GR QRW JUDQW DQ\ OiFHQVH, UiJKW, RU iQWUHUVW iQ RXU iQWHOHFwXDO SURSHUW\.

IWHPV WR EH REVHUYHG

□)RU VSHFiIfDwiRQ

- 7KiV VSHFiIfDwiRQ JXDUDQWHV WKH TXDoiW\ DQG SHUIRUPDQFH RI WKH SURGXFW DV iQGiYiGXDO FRPSRQHQWV. 7KH GXUDEiOiW\ GiIiHUV GHSHQGiQJ RQ WKH HQYiURQPHQW DQG WKH FRQGiWiRQV RI XVDJH. %HIRUH XVH, FKHFN DQG HYDOXDWH WKHiU FRPSDwiEiOiW\ ZiWK DFWXDO FRQGiWiRQV ZKHQ iQVWDOOHG iQ WKH SURGXFWV. :KHQ VDIHW\ UHTXiUHPhQWV FDQRW EH VDWiViIHG iQ \RXU WHFKQiFDO H[DPiQDwiRQ, iQIRUP XV iPPHGidWHO\.
- 塘 DR QRW XVH WKH SURGXFWV EH\RQG WKH VSHFiIfDwiRQV GHVFUiEHG iQ WKiV GRFXPHQW.

□ 8SRQ DSSoIFDwiRQ WR SURGXFWV ZKHUH VDIHW\ iV UHJDUGHG DV iPSRUWDQW

- iQVWDOO WKH IROORZiQJ V\vwHPV IRU D IDioVDiH GHViJQ WR HQVXUH VDIHW\ iI WKHVH SURGXFWV DUH WR EH XVHG iQ HTXisPHQW ZKHUH D GHIHFw iQ WKHVH SURGXFWV P\ FDXVH WKH ORVV RI KXPdq OiH RU RWKHU ViJQiIfDwiRQ GDPDJH, VXFK DV GDPDJH WR YHKiFOHV (DXWRPREiOH, WUDiQ, YHVW03, WUDiIf OiJKWV, PHGiFDO HTXisPHQW, DHURVSDFH HTXisPHQW, HOHFwUif KHDWiQJ DSSoIDQFHV, FRPEXVwiRQ/ JDV HTXisPHQW, URWDWiQJ URWDWiQJ HTXisPHQW, DQG GiVDVWU/FUiPH SUHYHQWiRQ HTXisPHQW.
- (13 7KH V\vwHP iV HTXiSSHG ZiWK D SURWHFwiRQ FiUFxiW DQG SURWHFwiRQ GHYiFH.
 - (23 7KH V\vwHP iV HTXiSSHG ZiWK D UHGXQGDQW FiUFxiW RU RWKHU V\vwHP WR SUHYHQW DQ XQVDiH VWDWXV iQ WKH HYHQW RI D ViQJOH iDXOW.

□ &RQGiWiRQV RI XVH

- %HIRUH XViQJ WKH SURGXFWV, FDUHiX00\ FKHFN WKH HiHFwV RQ WKHiU TXDoiW\ DQG SHUIRUPDQFH, DQG GHWHUPiQHG ZKHWKHU RU QRW WKH\ FDQ EH XVHG. 7KHVH SURGXFWV DUH GHViJQH DQG PDQXiDFWXUHG IRU JHQHUDO-SXUSRVH DQG VWDQGDUG XVH iQ JHQHUDO HOHFwURQiF HTXisPHQW. 7KHVH SURGXFWV DUH QRW iQWHQGHG IRU XVH iQ WKH IROORZiQJ VSHFiIfDwiRQV.
 - (13 IQ 0iTXiG, VXFK DV :DWHU, 2i0, &KHPiFDOV, RU 2UJDQiF VROYHQW.
 - (23 IQ GiUHFw VXQOiJKW, RXWGRUV, RU iQ GXVW.
 - (33 IQ YDSRU, VXFK DV GHZ FRQGHQVDWiRQ ZDWHU RI UHVivwiYH HOHPHQW, RU ZDWHU OHNDNJH, VDOW\ DiU, RU DiU ZiWK D KiJK FRQFHQWUDWiRQ FRUURViYH JDV, VXFK DV 02, +26, 1+3, 622, RU 12[.
 - (43 IQ DQ HQYiURQPHQW ZKHUH VWURQJ VWDWiF HOHFwUifwiW\ RU HOHFwURPDJHQWiF ZDYHV H[iVW.
 - (53 ORXQWiQJ RU SODFiQJ KHDW-JHQHUDWiQJ FRPSRQHQWV RU iQiODPPDEOHV, VXFK DV YiQ\O-FRDWHG ZiUHV, QHDU WKHVH SURGXFWV.
 - (63 6HDOiQJ RU FRDWiQJ RI WKHVH SURGXFWV RU D SuiQWHG FiUFxiW ERDUG RQ ZKiFK WKHVH SURGXFWV DUH PRXQWHG, ZiWK UHViQ DQG RWKHU PDWHUiDO.
 - (73 8ViQJ UHVROYHQW, ZDWHU RU ZDWHU-VROXEOH FOHDQHU IRU IOX[FOHDQiQJ DJHQW DiWHU VROGHUiQJ. (iQ SDUWiFXODU, ZKHQ XViQJ ZDWHU RU D ZDWHU-VROXEOH FOHDQiQJ DJHQW, EH FDUHiXO QRW WR OHDYH ZDWHU UHVigXHV3
 - (83 8ViQJ iQ WKH DWPRVSKUH ZKHUH VWUD\V DFig RU DONDOIQH.
 - (93 8ViQJ iQ WKH DWPRVSKUH ZKHUH WKUH DUH H[FHVViYH YiEUDWiRQ DQG VKRFN.
- 塘 3iHDVH DUUDQJH FiUFxiW GHViJQ IRU SUHYHQWiQJ iPSXOVH RU WUDQViWiRQDO YROWDJH. DR QRW DSS\ YROWDJH, ZKiFK H[FHHGV WKH iX00 UDWHG YROWDJH ZKHQ WKH FDSDFiWRUV UHFHiYH iPSXOVH YROWDJH, iQVWDQDQHRXV KiJK YROWDJH, KiJK SXOVH YROWDJH HWF.
- 2XU SURGXFWV WKHUH iV D SURGXFW DUH XViQJ DQ HOHFwURO\WH VROXWiRQ. 7KHUHIRUH, PiVXVH FDQ UHVXOW iQ UDSiG GHWHUiRUDWiRQ RI FKDUDFWHUivwiFV DQG iXQFwiRQV RI HDFK SURGXFW. (OHFWURO\WH OHNDNJH GDPDJH SuiQWHG FiUFxiW DQG DiHFwV SHUIRUPDQFH, FKDUDFWHUivwiFV, DQG iXQFwiRQV RI FXVWRPHU V\vwHP.

! \$\$\$oiFDWiRQ JXiGH0iQHvق5DGiDO OHDG 7ASHك

1. &iUFxiW GHViQ

1.1 2SHUDWiQJ WHPSHUDWXUH DQG IUHTXHQF

(OHFWUiFDO FKDUDFWHUiVWiFV RI WKH FDSDFiWRU DUH OiNHO\ WR FKDQJH GXH WR YDUiDWiRQ iQ WHPSHUDWXUH DQG/RU IUHTXHQF\ &iUFxiW GHViQJQHUV VKRXOG WDNH WKHVH FKDQJHV iQWR FRQViGHUDWiRQ.

(13 (IiHFW RI RSHUDWiQJ WHPSHUDWXUH RQ HOHFWUiFDO SDUDPHWHUV

\$W KiJKHU WHPSHUDWXUHV : OHNDNJH FXUUHQW DQG FDSDFiWDQFH iQFUHDVH ZKiOH HTXiYDOHQW VHUiHV UHViVWDQFH ((653 GHFUHDVHV.

\$W ORZHU WHPSHUDWXUHV : OHNDNJH FXUUHQW DQG FDSDFiWDQFH GHFUHDVH ZKiOH HTXiYDOHQW VHUiHV UHViVWDQFH ((653 iQFUHDVHV.

(23 (IiHFW RI IUHTXHQF\ RQ HOHFWUiFDO SDUDPHWHUV

\$W KiJKHU IUHTXHQFiHV : FDSDFiWDQFH DQG iPSHGQFH GHFUHDVH ZKiOH WDQ G iQFUHDVHV.

\$W ORZHU IUHTXHQFiHV : KHDW JHQHUDWHG E\ UisSOH FXUUHQW ZiOO UivH GXH WR DQ iQFUHDVH iQ HTXiYDOHQW VHUiHV UHViVWDQFH ((653.

1.2 2SHUDWiQJ WHPSHUDWXUH DQG OiH H[SHFWDQF

(13 ([SHFWHG OiH iV DiHFWHG E\ RSHUDWiQJ WHPSHUDWXUH. *HQHUDOO\, HDFK 10 & UHGXFWiRQ iQ WHPSHUDWXUH ZiOO GRXEONH WKH H[SHFWHG OiH. 8VH FDSDFiWRUV DW WKH ORZHVW SRVViEONH WHPSHUDWXUH EHORZ WKH XSSHU FDWHJRU\ WHPSHUDWXUH.

(23 Ii RSHUDWiQJ WHPSHUDWXUHV H[FHHG WKH XSSHU FDWHJRU\ OiPiW, UDSiG GHWHUiRUDWiRQ RI HOHFWUiFDO SDUDPHWHU ZiOO RFFXU DQG iUHYHUViEONH GDPDJH ZiOO UHVXOW.

&KHFN IRU WKH PD[iXP FDSDFiWRU RSHUDWiQJ WHPSHUDWXUHV iQFOXGiQJ DPEiHQW WHPSHUDWXUH, iQWHUQDO FDSDFiWRU WHPSHUDWXUH UivH GXH WR UisSOH FXUUHQW, DQG WKH IiHFW RI UDGidWHG KHDW IURP SRZHU WUDQViVWRUV, I&'V RU UHViVWRUV.

\$YRiG SODFiQJ FRPSRQHQWV, ZKiFK FRXOG FRQGXFV KHDW WR WKH FDSDFiWRU IURP WKH EDFN ViGH RI WKH FiUFxiW ERDUG.

(33 7KH IRUPXOD IRU FDOFXODWiQJ H[SHFWHG OiH DW ORZHU RSHUDWiQJ WHPSHUDWXUHV iV DV IROORZV ;

$$/2 = /1^{1/2} \cdot 10^{71-72}$$

/1 \$*XDUDQWHG OiH (K3 DW WHPSHUDWXUH, 71 &

/2 \$([SHFWHG OiH (K3 DW WHPSHUDWXUH, 72 &

71 \$SSHU FDWHJRU\ WHPSHUDWXUH + WHPSHUDWXUH UivH GXH WR UDWHG UisSOH FXUUHQW (&3

72 \$FWXDO RSHUDWiQJ WHPSHUDWXUH, DPEiHQW WHPSHUDWXUH + WHPSHUDWXUH UivH GXH WR UisSOH FXUUHQW (&3

(43 8ViQJ WKH FDSDFiWRU EH\RQG WKH HVWiPDWHG OiHWHiPH ZiOO UHVXOW iQ VKRUW FiUFxiW, HOHFWURO\WH OHDN, YHQW RSHQ,

DQG ODUJH GHWHUiRUDWiRQ RI FKDUDFWHUiVWiFV. 7KH OiHWHiPH FDQQRW JR DERYH 15 \HDUV GXH WR DJiQJ RI VHDOiQJ UXEEHU.

1.3 &RPPRQ DSSoiFDWiRQ FRQGiWiRQV WR DYRiG

7KH IROORZiQJ PiVDSSoiFDWiRQ ORDQ FRQGiWiRQV ZiOO FDXVH UDSiG GHWHUiRUDWiRQ RI D FDSDFiWRUv HOHFWUiFDO SDUDPHWHUV.

IQ DGGiWiRQ, UDSiG KHDWiQJ DQG JDV JHQHUDWiRQ ZiWiKi WKH FDSDFiWRU FDQ RFFXU, FDXViQJ WKH SUHVXUH UHOiHI YHQW

WR RSHUDWH DQG UHVXOWDQW OHNDNJH RI HOHFWURO\WH. 8QGHU H[WUHPH FRQGiWiRQV, H[SORViRQ DQG Iiuh iQJiWiRQ FRXOG UHVXOW.

7KH OHDNHG HOHFWURO\WH iV FRPEXVViEONH DQG HOHFWUiFDO\ FRQGXFWiYH.

(13 5HYHUVH YROWDJH

D& FDSDFiWRUV KDYH SRODUiW\, 7KHUHIRUH, SOHDVH GR QRW DSSO\ WKH UHYHUVH YROWDJH. 9HUiI\ FRUHFV SRODUiW\ EHIRUH iQVHUWiRQ.

)RU FiUFxiWv ZiWK FKDQJiQJ RU XQFHUWDiQ SRODUiW\, XVH D& EisRODU FDSDFiWRUV. D& EisRODU FDSDFiWRUV DUH QRW VXiWDEONH IRU XVH iQ \$& FiUFxiWv.

(23 &KDUJH / DiVFKDUJH DSSoiFDWiRQV

6WDQGDUG FDSDFiWRUV DUH QRW VXiWDEONH IRU XVH iQ UHSHDWiQJ FKDUJH/GiVFKDUJH DSSoiFDWiRQV.)RU FKDUJH/

GiVFKDUJH DSSoiFDWiRQV, FRQVXOW XV ZiWK \RXU DFWXDO DSSoiFDWiRQ FRQGiWiRQ.

)RU UXVK FXUUHQW, SOHDVH WR QRU H[FHHG 100 \$.

(33 21-2)) FiUFxiW

DR QRW XVH FDSDFiWRUV iQ FiUFxiW ZKHUH 21-2)) VZiWFKiQJ iV UHSHDWHG PRUH WKDQ 10000 WiPHV/SHU GD\.

IQ FDVH RI DSSoiQJ WR WKH WKHVHV 21-2)) FiUFxiW, FRQVXOW ZiWK XV DERXW FiUFxiW FRQGiWiRQ DQG VR RQ.

(43 2YHU YROWDJH

DR QRW DSSO\ YROWDJHV H[FHHGiQJ WKH PD[iPXP VSHFiIHG UDWHG YROWDJH. 9ROWDJHV XS WR WKH VXUJH YROWDJH UDWiQJ DUH DFFHSWDEOH IRU VKRUW SHUiRGV RI WiPH.

(QVXUH WKDW WKH VXP RI WKH D& YROWDJH DQG WKH VXSHUiPSRVHG \$& UissoH YROWDJH GRHV QRW H[FHHG WKH UDWHG YROWDJH.

(53 5iSSOH FXUHQW

DR QRW DSSO\ UissoH FXUHQWV H[FHHGiQJ WKH PD[iPXP VSHFiIHG YDOXH.)RU KiJK UissoH FXUHQW DSSoIFDWiRQV, XVH D FDSDFiWRU GHViJQH IRU KiJK UissoH FXUHQWV. IQ DGGiWiRQ, FRQVXOW XV iL WKH DSSoIHG UissoH FXUHQW iV WR EH KiJKHU WKDQ WKH PD[iPXP VSHFiIHG YDOXH. (QVXUH WKDW UDWHG UissoH FXUHQWV WKDW VXSHUiPSRVHG RQ ORZ D& EIdV YROWDJHV GR QRW FDXVH UHYHUVH YROWDJH FRQGiWiRQV.

(YHQ iW iV ZiWkiQ D UDWHG UissoH FXUHQW, iQ FDVH WKH SUDFiWfD0 XVH iV RYHU WKH SUH GHVFiEHG HQGXUDQFH oIHWiPH, iW FDXVHVH WKH iQFUHDVH RI GHWHUiRUDWiRQ RI (65 FKDUDFWHUiVWiF DQG WKH iQWHUQD0 JHQHUDWiRQ KHDW E\ UissoH FXUHQW. DXH WR WKiV, WKHUH iV VRPH SRVViEioiW\ RI YHQW RSHQ, EXOJiQJ RI VOHHYH DQG UXEEHU, HOHFWURO\WH OHdNDJH, DQG VKRW FiUFXiW, H[SORViRQ DQG iJQiWiRQ iQ WKH ZRUVV FDVH.

1.4 8ViQJ WZR RU PRUH FDSDFiWRUV iQ SDUDOOHO

(13 &DSDFiWRUV FRQQHFWHG iQ SDUDOOHO

7KH FiUFXiW UHViVWDQFH FDQ FORVHO\ DSSUR[iPDWH WKH VHUiHV UHViVWDQFH RI WKH FDSDFiWRU, FDXViQJ DQ iPEDODQFH RI UissoH FXUHQW ORDGV ZiWkiQ WKH FDSDFiWRUV. &DUHiX0 ZiUiQJ PHWKRGV FDQ PiQiPi]H WKH SRVViEoH DSSoIFDWiRQ RI DQ H[FHVViYH UissoH FXUHQW WR D FDSDFiWRU.

(23 &DSDFiWRUV FRQQHFWHG iQ VHUiHV

DiIHUHQFHV iQ QRUPD0 D& OHdNDJH FXUHQW DPRQJ FDSDFiWRUV FDQ FDXVH YROWDJH iPEDODQFHV.

7KH XVH RI YROWDJH GiYiGHU VKXQW UHVivWRUV ZiWk FRQViGHUDWiRQ WR OHdNDJH FXUHQWV FDQ SUHYHQW FDSDFiWRU YROWDJH iPEDODQFHV.

127 (: 30HDVH GR QRW XVH iQ WKH VHUiHV iQ WKH FDVH RI FRQGXFiWiYH SRO\PHU K\EUiG DOXPiQXP HOHFWURO\WIF FDSDFiWRU.

1.5 &DSDFiWRU PRXQWiQJ FRQViGHUDWiRQ

(13 DRXEOH-ViHG FiUFXiW ERDUGV

\$YRiG ZiUiQJ SDWWHUQV UXQV, ZKiFK SDVV EHWZHHQ WKH PRXQWHG FDSDFiWRU DQG WKH FiUFXiW ERDUG.

:KHQ GiSSiQJ iQWR D VROGHU EDWK, DQ H[FHV VROGHU PD\ GHSRViW XQGHU WKH FDSDFiWRU E\ FDSioODU\ DFiWiRQ, FDXViQJ VKRUW FiUFXiW EHWZHHQ DQRGH DQG FDWKRGH WHUPiQD0V.

(23 &iUFXiW %RDUG +ROH 3RViWiRQiQJ

7KH YiQ\0 VOHHYH RI WKH FDSDFiWRU FDQ EH GDPDJHG iL VROGHU SDVVHV WKURXJK D OHdG KROH iQWR WKH VXEVTXHQW\ SURFHVVG SDUWV.

6SHFiD0 FDUH ZKHQ ORFDWiQJ KROH SRViWiRQV iQ SUR[iPiW\ WR FDSDFiWRUV iV UHFRPPHQGHG.

(33 &iUFXiW %RDUG +ROH 6SDFiQJ

7KH VSDFiQJ RI FiUFXiW ERDUG KROHV VKRX0G PDWFK WKH OHdG ZiUH VSDFiQJ RI FDSDFiWRUV ZiWkiQ WKH VSHFiIHG WROHUDQFHV. IQFRUHFV VSDFiQJ FDQ FDXVH DQ H[FHVViYH OHdG ZiUH VUHV V GXUiQJ WKH iQVHUWiRQ SURFHV.

7KiV PD\ UHVXOW iQ SUHPDWXUH FDSDFiWRU IdiOXUH GXH WR WKH VKRUW RU RSHQ FiUFXiW, iQFUHDVHG OHdNDJH FXUHQW, RU HOHFWURO\WH OHdNDJH.

(43 &OHdUDQFH IRU FDVH PRXQWHG SUHVXUH UHOiHI

&DSDFiWRUV ZiWk FDVH PRXQWHG SUHVXUH UHOiHI UHTXiUH VXiiFiHQW FOHDUDQFH WR DOORZ IRU SURSHU SUHVXUH UHOiHI RSHUDWiRQ.

7KH PiQiPXP FOHDUDQFH DUH GHSHQGHQW RQ FDSDFiWRU GiDPHHUV DV iROORZV.

(DiD 10 PP WR DiD 16 PP : 2 PP PiQiPXP, DiD 18 PP : 3 PP PiQiPXP3

(53 :iUiQJ QHDU WKH SUHVXUH UHOiHI

\$YRiG ORFDWiQJ KiJK YROWDJH RU KiJK FXUHQW ZiUiQJ RU FiUFXiW ERDUG SDWKV DERYH WKH SUHVXUH UHOiHI.

)ODPPDEOH, KiJK WHPSHUDWXUH JDV WKDW H[FHHGV 100 & PD\ EH UHOHDVHG ZKiFK FRXOG GiVVROYH WKH ZiUH iQVXODWiRQ DQG iJQiWH.

(63 &iUFXiW ERDUG SDWWHUQV XQGHU WKH FDSDFiWRU

\$YRiG FiUFXiW ERDUG UXQV XQGHU WKH FDSDFiWRU, DV DQ HOHFWUiFD0 VKRUW FDQ RFFXU GXH WR DQ HOHFWURO\WH OHdNDJH.

(73 30HDVH QRWH WKH UHVRQDQW DiWHU SURGXFW iPSOHPHQWDWiRQ

7KH YiFiQW\ RI WKH UHVRQDQW SRiQW Zi00 WDNH D KHDY\ ORDQ RQ WKH FDSDFiWRU.

&DSDFiWRUV FDQ FDXVH UDSiG FkdQJH iQ FkdUDFWHUiVWiF DQG GURSRXW E\ WKiV ORDQ.

1.6 (OHFWUiFD0 iVR0DWiRQ RI WKH FDSDFiWRU

&RPSOHWHO\ iVR0DWH WKH FDSDFiWRU DV iROORZV.

%HWZHHQ WKH FDWKRGH DQG WKH FDVH DQG EHWZHHQ WKH DQRGH WHUPiQD0 DQG RWKHU FiUFXiW SDWKV.

1.7 &DSDFiWRU 6OHYH

7KH YiQ\O VOHHYH RU ODPiQDWH FRDwiQJ iV iQWQHGHG IRU PDUNiQJ DQG iGHQWiIiFDWiRQ SXUSRVHV DQG iV QRW PHDQW WR HOHFWUiFD00\ iQVXODWH WKH FDSDFiWRU.
7KH VOHHYH PD\ VSOiW RU FUDFN iI iPPHUVHG iQWR VROYHQWV VXFK DV WROXHQH RU [\OHQH DQG WKHQ VXEVHTXHQW\ H[SRVHG WR KiJK WHPSHUDWXUHV.

2. &DSDFiWRU KDQGOiQJ WHFKQiTXHV**2.1 &RQViGHUdWiRQV EHIRUH XViQJ**

(13 &DSDFiWRUV KDYH D IiQiWH OiIH. DR QRW UHXVH RU UHF\FOH FDSDFiWRUV IURP XVHG HTXiSPHQW.
(23 7UDQViHQW UHFYHU\ YROWDJH PD\ EH JHQHUDWHG iQ WKH FDSDFiWRU GXH WR GiHOHFWUiF DEVRUSWiRQ.
II UHTXiUHG, WKiV YROWDJH FDQ EH GiVFKDUJHG ZiWK D UHViVWRU ZiWK D YDOXH RI DERXW 1 N .
(33 &DSDFiWRUV VWRUHG IRU D ORQJ SHUiRG RI WiPH PD\ H[KiEiW DQ iQFUHDVH iQ OHDNDJH FXUUHQW.
7KiV FDQ EH FRUUHFWHG E\ JUDGXDO\ DSSO\iQJ UDWHG YROWDJH iQ VHUihV ZiWK D UHViVWRU RI DSSUR[iPDWHO\ 1 N .
(43 II FDSDFiWRUV DUH GURSSHG, WKH\ FDQ EH GDPDJHG PHFKQiFD00\ RU HOHFWUiFD00\, \$YRiG XViQJ GURSSHG FDSDFiWRUV.
(53 DHQWHG RU FUXVKHG FDSDFiWRUV VKRXOG QRW EH XVHG.
7KH VHDO iQWHiJUiW\ FDQ EH GDPDJHG DQG ORVV RI HOHFWURO\WH/ VKRUWHQHG OiIH FDQ UHVXOW.

2.2 &DSDFiWRU iQVHUWiRQ

(13 9HUiI\ WKH FRUUHFw FDSDFiWDQFH DQG UDWHG YROWDJH RI WKH FDSDFiWRU.
(23 9HUiI\ WKH FRUUHFw SRODUiW\ RI WKH FDSDFiWRU EHIRUH iQVHUWiRQ.
(33 9HUiI\ WKH FRUUHFw WHUPiQDO GiPHQiRQ DQG ODQG SDWWHUQ Vi]H EHIRUH PRXQW WR DYRiG VWUHV RQ WKH WHUPiQDOV.
(43 (QVXUH WKDW WKH OHdG FOiQFKiQJ RSHUdWiRQ GRQH E\ DXWR iQVHUWiRQ HTXiSPHQW GRHV QRW VWUHV WKH FDSDFiWRU OHdG ZKHUH WKH\ HQWHU WKH VHDO RI WKH FDSDFiWRU.

2.3 ORZ 6ROGHUiQJ

(13 DR QRW iPPHUVH WKH FDSDFiWRU ERG\ iQWR WKH VROGHU EDWK DV H[FHVViYH iQWUHQDO SUHVXUH FRXOG UHVXOW.
(23 \$\$SO\ SURSHU VROGHUiQJ FRQGiWiRQV (WHPSHUDWXUH, WiPH, HWF.3. DR QRW H[FHHG WKH VSHFiIiHG OiPiWV.
(33 DR QRW DOORZ RWKHU SDUUV RU FRPSRQHQWV WR WRXFK WKH FDSDFiWRU GXUiQJ VROGHUiQJ.
(43 5DGiD0 OHdG W\SH FDSDFiWRUV DUH QRW DOORZHG IRU WKH UHIORZ VROGHUiQJ.

2.4 ODQXD0 VROGHUiQJ

(13 \$\$SO\ VROGHUiQJ FRQGiWiRQV (WHPSHUDWXUH DQG WiPH3 EDVHG RQ WKH VSHFiIiFDWiRQ, RU GR QRW H[FHHG WHPSHUDWXUH RI 350 ˆ IRU 3 VHFRRQV RU OHVV.
(23 II OHdG ZiUH PXXV EH PRGiIiHG WR PHHW WHUPiQDO ERDUG KROH VSDFiQJ, DYRiG VWUHV RQ WKH OHdG ZiUH ZKHUH iW HQWHUWKH WKH FDSDFiWRU VHDO.
(33 II D VROGHUHG FDSDFiWRU PXXV EH UHPRYHG DQG UHiQVHUWHG, DYRiG H[FHVViYH VWUHV RQ WKH FDSDFiWRU OHdGV.
(43 \$YRiG SK\ViFD0 FRQWDFWV EHWZHHQ WKH WiS RI WKH VROGHUiQJ iURQ DQG FDSDFiWRUV WR SUHYHQW PHOWiQJ RI WKH YiQ\O VOHHYH.

2.5 2WKHU 6ROGHUiQJ &RQViGHUdWiRQV

5DSiG WHPSHUDWXUH UiVH GXUiQJ WKH SUHKHDW RSHUdWiRQ DQG UHViQ ERQGiQJ RSHUdWiRQ FDQ FDXVH FUDFNiQJ RI WKH FDSDFiWRUv YiQ\O VOHHYH.
)RU KHDW FXUiQJ, GR QRW H[FHHG 150 ˆ & IRU WKH PD[iXP WiPH RI 2 PiQXWHV.

2.6 &DSDFiWRU KDQGOiQJ DIWHU VROGHUiQJ

(13 \$YRiG PRYiQJ WKH FDSDFiWRU DIWHU VROGHUiQJ WR SUHYHQW H[FHVViYH VWUHV RQ WKH OHdG ZiUH ZKHUH WKH\ HQWHUWKH WKH VHDO. 7KH FDSDFiWRU PD\ EUHDN IURP HOHPHQW SRUWiRQ GXH WR D WRUTXH DW RXWHU UiP, FDXViQJ D ODUJH VWUHV WR WHUPiQDOV.
(23 DR QRW XVH WKH FDSDFiWRU DV D KDQGOH ZKHQ PRYiQJ WKH FiUFXiW ERDUG DVVHPEO\, 7KH WRWDO ZHiJKW RI WKH ERDUG ZRXOG DSSO\ WR HOHPHQW SRUWiRQ WKURXJK WHUPiQDOV, DQG WKH FDSDFiWRU PD\ EUHDN.
(33 \$YRiG VWUHV WKH FDSDFiWRU DIWHU DVVHPEO\ WR SUHYHQW IDiXUH GXH WR H[FHVViYH VKRFN. 7KH FDSDFiWRU PD\ EUHDN GXH WR H[FHVViYH VKRFN RU ORDG DERYH VSHFiIiHG UDQJH.

2.7 &iUFXiW ERDUG FOHDQiQJ

(13 &iUFXiW ERDUGV FDQ EH iPPHUVHG RU XOWUDVRQiFD00\ FOHDQHG XViQJ VXiWDEOH FOHDQiQJ VROYHQWV IRU XS WR 5 PiQXWHV DQG XS WR 60 ˆ & PD[iXP WHPSHUDWXUHV. 7KH ERDUGV VKRXOG EH WKURXJKO\ UiQVHG DQG GiUHG. 7KH XVH RI R]RQH GHSOHWiQJ FOHDQiQJ DJHQWV iV QRW UHFRRPPHQGHG IRU WKH SXUSRVH RI SURWHFWiQJ RXU HQYiURQPHQW.

岩7DUJHW VROYHQW

3iQH \$OSKD 67-1006, \$TXD &OHdQHU 2106(3, &OHdQ-WKUX 750+ / 750 / 7100, 6XQHOFH %-12, 6XQHOFH %-12, &ROG &OHdQHU 33-375, 7HFQR &OHdQHU 219, DK %H-FOHDU &:-5790, 7HOSHQH &OHdQHU (&-75, 7HFQRFDUH)5:-17 /)5:-1 /)59-1

(23 \$YRiG XViQJ WKH IROORZiQJ VROYHQW JURXSV XQOHVV VSHFiFD00\ DOORZHG iQ WKH VSHFiFDWiRQ ;
 (D3 +DORJHQDWHG FOHDQiQJ VROYHQWV ? H[FHSW IRU VROYHQW UHVivVDQW FDSDFiWRU W\SHV, KDORJHQDWHG VROYHQWV FDQ
 SHUPHDWH WKH VHDO DQG FDXVH iQWHUQDO FDSDFiWRU FRUURViRQ DQG IDiOXUH.
)RU VROYHQW UHVivVDQW FDSDFiWRUV, FDUHIX00\ IROORZ WKH WHPshudwxUH DQG WiPH UHTXiUHPHQWV EDVHG RQ WKH
 VSHFiFDWiRQ. 1,1,1-WUifKORURHWKDKH VKRXOG QHYHU EH XVHG RQ DQ\ DOXPiQXP HOHFwURO\WIF FDSDFiWRU.
 (E3 \$iND0iQH VROYHQWV ? FRXOG UHDFW DQG GiVvROYH WKH DOXPiQXP FdVH.
 (F3 3HWUROHXp EDVHG VROYHQWV ? GHWHUirUDWiRQ RI WKH UXEEHU VHDO FRXOG UHVX0W.
 (G3 ;\OHQH ? GHWHUirUDWiRQ RI WKH UXEEHU VHDO FRXOG UHVX0W.
 (H3 \$FHWRRH ? UHPRYDO RI WKH iQN PDUNiQJV RQ WKH YiQ\0 VOHHYH FRXOG UHVX0W.
 (33 \$ WKRURXJK GU\iQJ DIWHU FOHDQiQJ iV UHTXiUHG WR UHPRYH UHVigXD0 FOHDQiQJ VROYHQWV WKDw PD\ EH WUDSSHG
 EHWZHHQ WKH FDSDFiWRU DQG WKH FiUFXiW ERDUG. \$YRiG GU\iQJ WHPshudwxUH, ZKiFK H[FHHG WKH XSSHU FDWHJRU\
 WHPshudwxUH RI WKH FDSDFiWRU.
 (43 ORQiWRU WKH FRQWDPiQDWiRQ OHYHOV RI WKH FOHDQiQJ VROYHQWV GXUiQJ XVH iQ WHUPV RI HOHFwUifD0 FRQGXFwiYiW\,
 S+, VSHFiif JUDYiW\, RU ZDWHU FRQWHQW.
 &KORUiQH OHYHOV FDQ UivH ZiWk FRQWDPiQDWiRQ DQG DGYHUVH0 DiiHFw WKH SHUIRUPDQFH RI WKH FDSDFiWRU.
 &RQWURO WKH IOX[GHQViW\ iQ WKH FOHDQiQJ DJHQW WR EH OHVV WKDQ 2 PDVV%.
 (53 DSHHGQiQJ RQ WKH FOHDQiQJ PHWKRg, WKH PDUNiQJ RQ D FDSDFiWRU PD\ EH HUDVHG RU EOXUHG.
 3 30HDVH FRQVX0W XV il \RX DUH QRW FHUWDiQ DERXW DFFHSWDEOH FOHDQiQJ VROYHQWV RU FOHDQiQJ PHWKRgV.

2.8 ORXQWiQJ DGKHViYHV DQG FRDWiQJ DJHQW

: KHQ XViQJ PRXQWiQJ DGKHViYHV RU FRDWiQJ DJHQW WR FRQWURO KXPiGiW\, DYRiG XViQJ PDWHUiDOV FRQWDiQiQJ
 KDORJHQDWHG VROYHQWV.
 \$0VR, DYRiG WKH XVH RI FKORURSUHQH EDVHG SRO\PHUV.
 +DUGHQ RQ GU\ DGKHViYH RU FRDWiQJ DJHQWV ZH00 OHVV WKH VROYHQW VKRXOG EH OHiW.
 \$iWHU DSS0\iQJ DGKHViYHV RU FRDWiQJV, GU\ WKRURXJK0\ WR SUHYHQW UHVigXD0 VROYHQWV IURP EHiQJ WUDSSHG EHWZHHQ
 WKH FDSDFiWRU DQG WKH FiUFXiW ERDUG.

2.9)XPiJDWiRQ

iQ H[SRUWiQJ HOHFwURQiF DSS0iDQFHV ZiWk DOXPiQXP HOHFwURO\WIF FDSDFiWRUV, iQ VRPH FdVHV iXPiJDWiRQ WUHDWPHQW
 XViQJ VXFk KDORJHQ FRPSRXQG DV PHWk\0 EURPiGH iV FRQGXFwHG IRU ZRRGHQ ER[HV.
 Ii VXFk ER[HV DUH QRW GuiHG ZH00, WKH KDORJHQ OHiW iQ WKH ER[iV GiVSHUVHG ZKi0H WUDQVSRUWHG DQG HQWHUV iQ WKH
 FDSDFiWRUV iQViGH.
 7KiV SRViE0\ FDXVHV HOHFwUifD0 FRUURViRQ RI WKH FDSDFiWRUV. 7KHUHiRUH, DIWHU SHUIRUPiQJ iXPiJDWiRQ DQG GU\iQJ
 PDNH VXUH WKDw QR KDORJHQ iV OHiW.
 DRQW SHUIRUP iXPiJDWiRQ WUHDWPHQW WR WKH ZKROH HOHFwURQiF DSS0iDQFHV SDFNHG iQ D ER[.
 /HDYH PRUH WKDQ 1/3 RI WKH VHDOiQJ SRUWiRQ RSHQ, DQG GR QRW FRYHU WKDw SRUWiRQ ZiWk DQ\ DGKHViYHV RU FRDWiQJ.

2.10)OX[

Ii \RX XVH D KDORJHQ W\SH (&KORUiQH W\SH, %URPiQH W\SH, HwF.3 KiJK-DfwiYiW\ IOX[, SOHDVH XVH iW DIWHU FRQiUPDWiRQ
 iQ DGYDQFH, DV iW PD\ KDYH DQ iPSDFW RQ SHUIRUPDQFH DQG UHOidei0iW\ RI WKiV SURGXFW GXH WR WKH UHVigXH RI WKH IOX[.

3. 3UHFDXWiRQV IRU XViQJ FDSDFiWRUV

3.1 (QYiURQPHQW0 FRQGiWiRQV

&DSDFiWRUV VKRXOG QRW EH VWRUHG RU XVHG iQ WKH IROORZiQJ HQYiURQPHQWV.
 (13 ([SRVXUH WR WHPshudwxUH DERYH WKH XSSHU FDWHJRU\ RU EHORZ WKH ORZHU FDWHJRU\ WHPshudwxUH RI WKH FDSDFiWRU.
 (23 DiUHFW FRQWDFW ZiWk ZDWHU, VDOW ZDWHU, RU Ri0.
 (33 +iJK KXPiGiW\ FRQGiWiRQV ZKHUH ZDWHU FRXOG FRQGHQVH RQ WKH FDSDFiWRU.
 (43 ([SRVXUH WR WR[iF JDVHV VXFk DV K\GURJHQ VX0iGH, VX0iXiF DFiG, QiWUiF DFiG, FKORUiQH, FKORUiQH FRPSRXQG,
 EURPiQH, EURPiQH FRPSRXQG RU DPPrQiD.
 (53 ([SRVXUH WR R]RQH, UDGiDWiRQ, RU XOWUDYiR0iW UD\.
 (63 9iEUDWiRQ DQG VKRFN FRQGiWiRQV H[FHHGiQJ VSHFiIHG UHTXiUHPHQWV.
 (YHQ ZiWkiQ WKH VSHFiIHG UHTXiUHPHQWV, D ODUJH YiEUDWiRQ DFFHOHUDWiRQ PD\ EH DSS0iHG GXH WR UHVQRDQFH,
 VR EH VXUH WR HYDOXDWH DQG FRQiUP ZiWk WKH DFwXD0 SURGXFW.

3.2 (OHFWUifD0 SUHFDXWiRQV

(13 \$YRiG WRXFKiQJ WKH WHUPiQDOV RI D FDSDFiWRU DV D SRViE0H HOHFwUif VKRFN FRXOG UHVX0W. 7KH H[SRVHG
 DOXPiQXP FdVH iV QRW iQVXODWHG DQG FRXOG DOVR FDXVH HOHFwUif VKRFN iI WRXFKHG.
 (23 \$YRiG VKRUW FiUFXiWiQJ WKH DUHD EHWZHHQ WKH FDSDFiWRU WHUPiQDOV ZiWk FRQGXFwiYH PDWHUiDOV iQFOXGiQJ OiTXiGV
 VXFk DV DFiGV RU DOND0iQH VROXWiRQV.
 (33 \$ ORZ-PROHF0ODU-ZHiJKW-VKiUR[DQH ZKiFK iV iQF0XGHG iQ D Vi0iFRQ PDWHUiD0 VKD00 FDXVHV DEQRUPD0 HOHFwUifD0
 FKDUDFWHUiVWiFV.

4. (PHUJHQF\ SURFHGXUHV

(13 II WKH SUHVXUH UHOiHI RI WKH FDSDFiWRU RSHUDWHV, iPPHGidWHO\ WXUQ RII WKH HTXiSPHQW DQG GiVFRQQHFw IURP WKH SRZHU VRXUFH.
 7KiV Zi00 PiQiPi]H DQ DGGiWiRQDO GDPDJH FDXVHG E\ WKH YDSRUi]iQJ HOHFWURO\WH.
 (23 \$YRiG FRQWDFW ZiWK WKH HVFDSiQJ HOHFWURO\WH JDV, ZKiFK FDQ H[FHHG 100 & WHPSHudWXUHV.
 II HOHFWURO\WH RU JDV HQWHUV WKH H\H, iPPHGidWHO\ IOXVK WKH H\H ZiWK ODUJH DPRXQWV RI ZDWHU.
 II HOHFWURO\WH RU JDV iV iQJHVWHG E\ PRXWK, JDUJOH ZiWK ZDWHU.
 II HOHFWURO\WH FRQWDFWV WKH VNiQ, ZDVK ZiWK VRDS DQG ZDWHU.

5. /RQJ WHUP VWRUDJH

(13 /HDNDJH FXUUHQW RI D FDSDFiWRU iQFUHDVHV ZiWK ORQJ VWRUDJH WiPHV. 7KH DOXPiQXP R[iGH i0P GHWHUiRUDWHV DV D IXQFWiRQ RI WHPSHudWXUH DQG WiPH.
 II XVHG ZiWKRXW UHFROGiWiRQiQJ, DQ DEQRUPDOO\ KiJK FXUUHQW Zi00 EH UHTXiUHG WR UHVWRUH WKH R[iGH i0P.
 7KiV VXUJH FXUUHQW FRXOG FDXVH WKH FiUXiW RU WKH FDSDFiWRU WR Idi0.
 ([SiUDWiRQ GDWH iV 42 PRQWKV IURP RXWJRiQJ iQVSHFWiRQ GDWH.
 +RZHYHU, H[SiUDWiRQ GDWH IRU VHUiHV ZKiFK DUH QRW OiVWHG EHORZ iV 12 PRQWKV IURP RXWJRiQJ iQVSHFWiRQ GDWH.

6HUiHV	([SiUDWiRQ GDWH 42 PRQWKV IURP RXWJRiQJ iQVSHFWiRQ GDWH
)&,)K, +D, 7\$, 73	

) RU VWRUDJH FRQGiWiRQ, NHHS URRP WHPSHudWXUH (5 & WR 35 &3 DQG KXPiGiW\ (45 % WR 85 %3 ZKHUH GiUHFw VXQVKiQH GRHVQ'W UHDFK.

كق (QYiURQPHQWDO &RQGiWiRQV

DR QRW VWRUH XQGHU FRQGiWiRQ RXWViGH WKH DUHD GHVFUiEHG iQ WKH VSHFiLiFDWiRQ, DQG DOVR XQGHU FRQGiWiRQV OiVWHG EHORZ.
 (D3 ([SRVXUH WR WHPSHudWXUHV DERYH WKH XSSHU FDWHJRU\ RU EHORZ WKH ORZHU FDWHJRU\ WHPSHudWXUH RI WKH FDSDFiWRU.
 (E3 DiUHFw FRQWDFW ZiWK ZDWHU, VDOW ZDWHU, RU Ri0.
 (F3 +iJK KXPiGiW\ FRQGiWiRQV ZKHUH ZDWHU FRXOG FRQGHQVH RQ WKH FDSDFiWRU.
 (G3 ([SRVXUH WR WR[iF JDVHV VXFK DV K\GURJHQ VXOiGH, VXOiXUiF DFiG, QiWUiF DFiG, FKORUiQH, &KORUiQH FRPSRXQG, %URPiQH, %URPiQH FRPSRXQG RU DPPRQiD.
 (H3 ([SRVXUH WR R]RQH, UDGiDWiRQ, RU XOWUDYiROHW UD\V.
 (I3 9iEUDWiRQ DQG VKRFN FRQGiWiRQV H[FHHGiQJ VSHFiIiHG UHTXiUHPhQWV.

6. &DSDFiWRU GiVSRVDO

:KHQ GiVSRViQJ FDSDFiWRUV, XVH RQH RI WKH IROORZiQJ PhWKRGV.
 (13 IQFiQHudWH DiWHU FUXVKiQJ WKH FDSDFiWRU RU SXQFWXiQJ WKH FDQ ZDOO (WR SUHYHQW H[SORViRQ GXH WR iQWHUQDO SUHVXUH UiVH3.
 (23 DiVSRVH DV VROiG ZDVWH.
 127(: /RFDO ODZV PD\ KDYH VSHFiIiF GiVSRVDO UHTXiUHPhQWV ZKiFK PXVW EH IROORZHG.

7KH SUHFDXWiRQV iQ XViQJ D0XPiQXP HOHFWURO\WiF FDSDFiWRUV IROORZ WKH "6DIHW\ DSSOiFDWiRQ JXiGH IRU WKH XVH iQ H[HGD0XPiQXP HOHFWURO\WiF FDSDFiWRUV IRU HOHFWURQiF HTXiSPHQW", 5&5-2367D iVXHG E\ J(I7\$ iQ 2FWREHU 2017.
 30HDVH UHiHU WR WKH DERYH DSSOiFDWiRQ JXiGH IRU GHWDi0V.