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A	1. Gui • F r • T t	i deline Fujitsu Ta nanagem environm The belov he printe	for product akamizawa Con nent per ISO 14 nent" v lists the comp er is to be recycl F	recycling mponent Co., Ltd 2001 with a polic ponents and their led. TP-642MCL30	d. is making a y "Better corp r materials u 1/302 – List	an effort to promote the environr porate activities while valuing th sed in this printer. Refer this lis	nental e st when	A
			-			of materials		
_	_	No.	Nam	e of component	S	Material		
		1	Printer fram	e	Р	PPO resin (with GF)	_	
		2	Gear cover		Р	OM resin		
		3	Rubber roller		S	ilicone rubber + SUS	I	
		4 F	Platen gear,	middle gears 1	, 2 P	OM resin	I	
В		5	Motor FC pl	ato	<u> </u>	TIS	<u> </u>	Ь
		7	Sensor fixtu	re	A	ABS resin		
		8	Knob		A	ABS resin		
		9	FG plate		S	US		
		10	Head-up arm	n	Z	inc alloy		
		11	Head-up leve	er	P	OM resin		
		12	Thermal hea		A	luminum + ceramic substrat	e	
		13	Head pressu	rizing shaft	5		<u> </u>	
С		14	Head suppor	t Doard	<u> </u>		<u> </u>	С
		15	Arm spring	rizing spring	2 2		<u> </u>	
		10	Spring (Only	MCI 301)	2		<u> </u>	
		17	Pinch rollor	$\frac{1}{(Oply MCI 301)}$	ם ער ע	20M rosin		
	-	10	Rearing	(Only MCL301) I S	intered allov		
		20	FG coil sprin	Ø	S			
	-	21	Guide film ((- <u>s</u> Only MCL301)	P	'ET resin		
		22	Auto cutter		*	1)		
	I	Please ref	fer to specificat	ions of FTP-6420	CT001			
			I. I					
C	"Al	bbreviat SU	ions for the m S: Stainle	naterials used" ss steel				D
	_	PO	M: Polyace T: Polyace	tal resin	halata)			
		PE PP(1: Poly(et	nyiene terephi envlene ovid) re	nalate) sin			
		SPG	CC: Rolled s	teel plate	5111			
ECI		PI:	Polyimi	de				
		GF	: Fibergl	ass resin				
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E								
8								
F								E
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	DESIGN		GHECK	U L S G R I	APPLY	FUJITSU TAKAMISAWA COMPONENT LIMI		
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	A	[IT	EM						SP	ESI	FICAT	ION			
			Printing		Prin	tin <u>g m</u> et	thod	The	ermal s	sensiti	ive lin	ie do	t <u>me</u> th	od			
			specificatio	ons	Effe	ctive		104	mm								
					prin	ting wid	th										
					Hea	d		832	dots /	line							
				_	conf	iguratio	n										
				_	Dot	pitch		0.12	25(ver	tical d	irectio	on) x	0.125(horizo	ntal directi	ion)	
		Print density							0.8 dition easuri A-65 fr	or hi wh ng ins com Ke	gher en the trume onica	at e spe ent : Co.,I	the F& cified p SAKUI Ltd.	&T st paper i RA der	andard pr .s used. ısitometer	intin	a D
	В				Prin	ting spe	ed	At 2 Ma	24V dr ximun	ive 1 80mi	m / se	cond	(640 d	ot line	es / second)		
								Ats	standa	rd par	ber an	d F8	T high	i-speed	l printing r	node.	
			Specified		High	n-sensiti er	vity	TF5	60KS-H	E4			0	N	PPON PAP	PER	
			puper(1)	_	Star	dard pa	per	TE	50KS-F	7				NI	PPON PAP	PER	-
					Stur	iuui u pu	Per	PD	150R					0	II PAPER	1110	
					Med	ium-teri	m	TF	BOKS-F	71				NI	PPON PAP	PER	_
					pres	ervable		P22	OVBB	-1				MITS	SUBISHI P	APEF	2
					pape	er		PD	170R					O.J	I PAPER		-
	С				Long	g-term		TP5	50KJ-F	2				NIF	PON PAPE	ER	_
	Ŭ				pres	ervable		AFI	P-235					MITS	SUBISHI P	APEF	2
					pape	er		PD	160R					С	JI PAPER		
			Paper widt	h				MC	L301 :	: 112+0	-1 mm	(fro	nt inse	rtion)			7
			-					MC	L302 :	114+0	-1 mm	ı (rea	ır inser	rtion)			
		Paper feed method					Fric exci	ction f	feed (1	dot	line	/ 4 pt	ılse, b	ipolar 1-2	phas	е	
			Paper feed	accı	ıracy	7		±5% app	5 at 1 rox.10	fixed-s 0g(0.9	peed 8N) (:	feed ±2%	l with at 25°0	the Cand 6	back tensi 60%RH)	on o	f
			Line gap : enable driv	in o ve	ne p	rint line	e by	Gap dot	betw line :	een ri 0.125r	ght a nm	nd le	eft prin	t line	in the sam	e lin	е
	כ		Detection function	H de	ead t etecti	tempera ion	ture	The	ermiste	or							
	-			Pa	aper lark (detection	n 1	Pho	otointe	rrupte	er						
				H	ead 1	up detec	tion	Mic	roswit	ch							_
Z				Н	ome-	position		Mic	roswit	ch							-
<u>110</u>				de	etecti	ion											
SEC			External of	dime	nsior	ns(W x	D x	149	mm x	68mm	n x 39	mm	(exclud	ing th	e lever and	knob)
Ц		∎⊢	Mass					Anr	rox 5	00g							-
ONTR			*1 Fo	r usi	ing ι	unspecifi	ed p	aper,	both	sides	shall	cons	sult an	d eval	uate and c	heck	it to
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Operating power Head Head Head For printing For printing speed: 80mm/sec. head resistance value: 1275 (0) For logic For logic Voltage: 24 VDC ±5%. Current : Maximum 1.0A (by the F&T standard constant-current drive circuit) Environmental Operating temperature and humidity(2) 5°C to 40°C, 20 to 83%RH No condensation Storage temperature and humidity -20°C to 60°C, 5 to 95%RH No condensation Social temperature and humidity Reliability Vibrage: 24 VDC ±5%. Current : Maximum 1.0A (by the F&T standard constant-current drive circuit) Storage temperature and humidity Reliability Vibrage: 24 VDC ±5%. Current : Maximum 1.0A (by the F&T standard constant-current drive circuit) Reliability Vibrage: 24 VDC ±5%. Current : Maximum 1.0A (by the F&T standard constant-current drive circuit) Reliability Vibrage: 24 VDC ±5%. (bon-operation) -20°C to 60°C, 5 to 95%RH No condensation paper is excluded Impat 10 to 55 to 10 Hz, one-side amplitude 0.15mm, 1 octave/minute, maximum 1.0G -20°C cycles for each of X, Y, and Z directions Impat 10 to 55 to 10 Hz, one-side amplitude 0.15mm, 1 octave/minute, maximum 1.0G -20°C cycles for each of X, Y, and Z directions Impat 50C, 11ms, half-sine wave, 5 times for each of the X, Y, (ton-operation) -20°C cycles for each of X, Y, and Z directions Impat 10				ITF	EM .					SF	PESH	FICATI	ON			
Image: Protect Protocols Part divided drive, Printing rate : 50% Printing speed : Somm/sec. head resistance value : 1275 Ω) For logic Voltage : 5 VDC : 55% Current : Maximum 0.0A (by the F&T standard constant-current drive drout) Environmental Operating characteristics temperature and humidity(?2) Storage -20°C to 60°C, 5 to 95%RH. No condensation paper is excluded and numidity(?2) Storage Voltage : 24 VDC : 50 to 10 Hz, one-side amplitude 0.15mm.1 octowe/minute, maximum 1G 20 Cycles for each of X, Y, and Z directions Temperature 50C, 11ms, half-sine wave, 5 times for each of the X, Y, (non-operation) octave/minute, maximum 1G 20 Cycles for each of X, Y, and Z directions Temperature and humidity cycle (non-operation) Two successive cycles of : 25°C (2 hours) to room temperature (2 hours) to 65°C and 85% RH (2 hours) to room temperature (2 hours) to 65°C and 85% RH (2 hours) to room temperature (2 hours) to 65°C and 85% RH (2 hours) to room temperature (2 hours) to 65°C and 85% RH (2 hours) to room temperature (2 hours) to 65°C and 85% RH (2 hours) to room temperature (2 hours) to 85% or eless) Life Electrical life Thundred millino pulses (at the F&T standard printing condition) Mechanical life Pap		Oper powe	ating er	Hea	d For pi	rinting	Voltag Curre	je : 2 nt :	24 VD peak	C ±5% currer	6 ht of a	approx.	4.1A			
Tead resistance value: 1273 40 For logic For logic Current: Maximum 0.3A Motor drive Voltage: 24 VDC 55% Current: Maximum 1.0A (by the F&T standard constant-current drive circuit) Environmental characteristics Operating temperature and humidity?2 Storage -20°C to 60°C, 5 to 95%RH. No condensation paper is excluded and humidity?2 Noise 60 dB or less at 1m from the surface of the printing mechanism. Reliability Vibration 10 to 55 to 10 Hz, one-side amplitude 0.15mm.1 octave/minute, maximum 1G (*3) (mon-operation) 20 cycles for each of X, Y, and Z. directions Impact 50G. 11ms, half-sine wave, 5 times for each of the X, Y, and Z directions Pack drop 75cm drop for 6 surface, corner and ridges in pack Temperature and two successive cycles of -25°C (2 hours) to room temperature (2 hours) to forom temperature (2 hours) to forom temperature (2 hours) to forom temperature (2 hours) to for and 5% RH (2 hours) to room temperature (2 hours) to forom temperature (2 hours) to 500 or more times when one up and down are counted as one time Life Electrical life 1 humdred million pulses (at the F&T standard printing condition) Life of the head up lever 300 thousand times or more(cuting cycle is 2 s or longer) Printing start position M							(2-par print	(2-part divided drive, Printing rate : 50% printing speed : 80mm/sec,								
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Image: Intermediate intermediation in the properties of the printing intermediation in the printing printing printing intermediation in the printing printing printing printing intermediation in the printing printer printing printing printing printing pri			Pack dropTemperature and humidity cycle (non-operation)LifeFlectrical life				75cm	Two successive cycles of -25°C (2 hours) to room								
Image: Condition in the provided in the condition previded in the condit (condition previded in the condition previde		Life					room t	rati tem drec	ure (2 <u>perat</u> i d milli	nours ure (2) ion pu	s) to (hours lses (s) at the	$\frac{10.85\%}{F&T state}$	andard p	ours) to	
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International termine 1.2 x 10° notifies (time with the difference is conducted) with the specified circuit Cutting life 300 thousand times or more(cutting cycle is 2 s or longer) Printing start position at the left end MCL301 : 4±1 mm , MCL302 : 5±1 mm from the paper edge to the print start position. This value is : 1. When the paper of 112mm (MCL301) and 114mm (MCL302) width is used 2. When the paper of 112mm (MCL301) and 114mm (MCL302) width is used 2. When no paper jam or collapse occurs Paper positioning by mark detection Approx. 7.5mm (MCL301) and 10.2mm (MCL302) from the mark end position to heating element. This value is when paper is inserted from front, fixed-speed feed is used, and paper feeding by marking detection is the default (2mm). *2 The print density is guaranteed in this range. The printer can operate from 0°C to 50°C. *3 After the test, the printing specifications shall be satisfied. Image: Desite test of the printing specifications shall be satisfied. Image: Desite test of the printing specifications with the satisfied. Image: Desite test of test test of t			Life	of the	head up	lever	5000 c as one	r n tin	nore ti ne bours	$\frac{1}{(time)}$	when	one up	and do	wn are $\frac{1}{1}$	counted	
Printing start position at the left end MCL301 : 4±1 mm , MCL302 : 5±1 mm from the paper edge to the print start position. This value is : 1. When the paper of 112mm (MCL301) and 114mm (MCL302) width is used 2. When 1-ply long-term perceivable paper is used 3. When no paper jam or collapse occurs Paper positioning by mark detection Approx. 7.5mm (MCL301) and 10.2mm (MCL302) from the mark end position to heating element. This value is when paper is inserted from front, fixed-speed feed is used, and paper feeding by marking detection is the default (2mm). *2 The print density is guaranteed in this range. The printer can operate from 0°C to 50°C. *3 After the test, the printing specifications shall be satisfied. ITILE FTP-642MCL301/302 PRODUCT SPECIFICATIONS IDIT D A T E DESISTEN 0 E S C R 1 P T 1 0 N FUNTSU TAKAMISAWA COMPONENT LIMITED			Cutti	ing life	e		with 300 th	the	speci sand t	fied ci imes c	rcuit or mo	re(cutti	ng cycle	is 2 s or lo	onger)	
Start position. This value is : 1. When the paper of 112mm (MCL301) and 114mm (MCL302) width is used 2. When 1-ply long-term perceivable paper is used 3. When no paper jam or collapse occurs Approx. 7.5mm (MCL301) and 10.2mm (MCL302) from the mark end position to heating element. This value is when paper is inserted from front, fixed-speed feed is used, and paper feeding by marking detection is the default (2mm). *2 The print density is guaranteed in this range. The printer can operate from 0°C to 50°C. *3 After the test, the printing specifications shall be satisfied. DRAW Na DESIGN 0 FIECK DESIGN 0 FIECK DESIGN 0 FIECK DESIGN 0 FIECK DESIGN 0 FIECK DESIGN 0 FIECK		Print at th	ting st e left (art po end	sition		MCL3 MCL3	01 : 02	: 4±1 1 : 5±1	mm , mm i Thia	from	the pa	per ed	ge to th	e print	
2. When 1-ply long-term perceivable paper is used 3. When no paper jam or collapse occurs Paper positioning by mark detection Approx. 7.5mm (MCL301) and 10.2mm (MCL302) from the mark end position to heating element. This value is when paper is inserted from front, fixed-speed feed is used, and paper feeding by marking detection is the default (2mm). *2 The print density is guaranteed in this range. The printer can operate from 0°C to 50°C. *3 After the test, the printing specifications shall be satisfied. Intermediate							1. W	her /her	11011. 1 the 1302)	paper width	of 11	l 2mm ed	(MCL30	01) and	114mm	
Paper positioning by mark detection Approx. 7.3mm (MCL301) and 10.2mm (MCL302) from the mark end position to heating element. This value is when paper is inserted from front, fixed-speed feed is used, and paper feeding by marking detection is the default (2mm). *2 The print density is guaranteed in this range. The printer can operate from 0°C to 50°C. *3 After the test, the printing specifications shall be satisfied. Image: The print density is guaranteed in this range. The printer can operate from 0°C to 50°C. *3 After the test, the printing specifications shall be satisfied. Image: The print density is guaranteed in this range. The printer can operate from 0°C to 50°C. *3 After the test, the printing specifications shall be satisfied. Image: The printer density is detected by the printer density is guaranteed in this range. The printer can operate from 0°C to 50°C. *3 After the test, the printing specifications shall be satisfied. Image: The printer density is density is density in the printer density is density in the printer density is density in the printer density is density if the printer density if the printer density if the		Deres	•			1_	2. W 3. W	her her	1 1-ply 1 no p	y long- aper ja	-term	percei collap	vable p se occu	aper is u rs	ised	
fixed-speed feed is used, and paper feeding by marking detection is the default (2mm). *2 The print density is guaranteed in this range. The printer can operate from 0°C to 50°C. *3 After the test, the printing specifications shall be satisfied. IIILE FTP-642MCL301/302 PRODUCT SPECIFICATIONS DRAW No. A1NA02243-0301/6 EDT D E S C R I P T I O N FUJITSU TAKAMISAWA COMPONENT LIMITED		Pape deteo	tion	tionin	g by mar	ĸ	Appro the ma This	x. 7 ark valı	.5mm end p ue is	wher	1301) n to k n paj	and I neating per is	o.2mm elemen inserte	(MCL30) nt. ed from	front,	
*3 After the test, the printing specifications shall be satisfied. *3 After the test, the printing specifications shall be satisfied. TITLE FTP-642MCL301/302 PRODUCT SPECIFICATIONS DRAW No. A1NA02243-0301/6 EDIT D.A.TE DESIGN CHECK DESCRIPTION FUJITSU TAKAMISAWA COMPONENT LIMITED = 5/5/5		*	2 The	print	density i	s guara	fixed-s detect	spee ion n th	ed feed is the is rar	d is us <u>e defau</u> 1ge. Tł	sed, a ult (2) ne pri	nd pap mm). inter ca	er feed	ing by m ate from	narking 0°C to 50) °C.
EDIT D A T E DESIGN CHECK DESCRIPTION FUJITSU TAKAMISAWA COMPONENT LIMITED E 5/5		*	3 Afte	r the	test, the	e print	ing spe	cifi	cation	is sha	ll be	satisf	ied.			
EDIT D. R. T. E D. E. S. G. R. I. P. T. I. Q. N. FUJITSU TAKAMISAWA COMPONENT LIMITED												TITLE F	TP-642	MCL301	/302	
EDIT D A T E DESIGN CHECK DESCRIPTION FUJITSU TAKAMISAWA COMPONENT LIMITED $\frac{1}{10}$ 5/5												P Draw No.	RODU(A1NA02	<u>CT SPEC</u> 2243-030	<u>CIFICAT</u> 1/6	
TRESTRATE A CHECK I CAPPLY I C			TE D	ESIGN	N CHECK		O E S (RI		0 N		FUJITSU TA	KAMISAWA	COMPONENT I		5/5







			1		2		3		4
		7.2 P	aper Feed	Motor					
		(1)	Connecto	rs used					
	A		Motor s	ide(housi	ng): PHR-4 (made by J.	S.T) or equivalent		A
			Remote	side: B4	4B-PH-PH-K-S	(made by J	.S.T) or equivalent		
		(2)	Pin assig	nment on t	the motor side				
			Number	Symbol	Signal na	me			
	В		1 2 3 4	*B B *A A	Excitation sigr Excitation sigr Excitation sigr Excitation sigr	nal *B nal B nal *A nal A			В
		7.3 S	ensor Con	nector					
		(1)	Connecto	rs used					⊢
			Sensor s	ide(housi	ng) : PHR-5	(made by J.	S.T) or equivalent		
	С		Remote	side: B5	B-PH-K-S (mad	e by J.S.T) o	or equivalent		с
		(2)	Pin assig	nment on t	the sensor side				
			Number	Symbol	Signal na	me			⊢
			1	VSEN	Power for the	paper senso			L
			2 3	PHE PHK SW1	Photointerrup	ter emitter ter cathode			
			4 5	SW1 SW2	Head up detec	tion switch a	2		
	С								D
TION									
SEC									
CONTROL	Î								
ENT									E
DDCUM									
للا للا									╧
DA							PRODUCT SP	301/302 <u>ECIFICATIONS</u>	<u>S</u>
		EDIT N + T F	DESTRN	СНЕСК	ΠΕΣΟΒΙ	₽ŢΙΟΝ	A1NA02243-(0301/6	[≥] F
		DESIGN	1 2 2 5 1 4 1	CHECK		APPLY	FUJITSU TAKAMISAWA COMPON		9

		1		2			3	4	ļ]		
	8. Thern	nal Head S	pecifications	5							
A	(1) (1) 1. 2. 3. 4. 5.	General Char Method Total num Dot pitch Dot dimen Average re	acteristics ber of dots usions esistance		: Thermal : 832 dots/ : 0.125 mr : 0.110 x (: 1500 Ω±1	line dot line n (Vertic 0.132 mn 5 %	method al) x 0.125 mm (H n	orizontal)	ţ		
В	(2) 1. 2. 3. 4.	Maximum rat Maximum Maximum Maximum energized c	ing voltage applie energy applie board temper number of co lots	ed d ature ncurre	: 27V : 0.352 mJ (Vset=24.0 : 70°C (the ntly : 384 dots	/dot V, Ton=0 ermistor	.95 ms, Tcy=2.5ms) temperature)		E		
	3) E	lectrical char Circuit blo Electrical	racteristics ock diagram characterisitics	s	: Fiqure 4 : Table 1						
С	3. 4. 5. 6. 7. 8. 9.	Timing cha Equivalent Driver forn data trans Data inpur Power sup Printing m	art t circuit mation fer method t frequency plu for driver nethod	~	 Figure 5 Figure 6 64 bits x 13 drivers Single-input serial transfer 5.0 MHz or lower 5 V ± 5% at 0.2 A Independent 5-enable method 						
	(4) E	Electrical ope	erating condition	ns (nom	inal ratings)				F		
2	1. 2. 3. 4. 5. mo 6.	Power app Width of p Energy ap Printing c This can b ethodVoltag Current co	olied (Po) pulse applied plied (Eo) ycle period pe shorten by e applied (VH ponsumption	(Ton) using	: 0.370 W/ : 0.73 mse : 0.27 mJ : 2.5 msec self-hystere : 24.0V : 5.9 A (pe	dot c / dot (25 (at 25°C esis ak value	5°C) C, 2-part divided di e at 24.0 V)	rive)			
NOITO	Notes : Energy cal	culation form	ula								
L SEI	Head a Resistance	average value (Rav)	Power applie	d (P)	Power lo	ss (P _L)	Voltage drop (V _L)		F		
	1500	±15%	0.370 W/c	dot (VH -	0.013 W	<u>7 / dot</u> Pr	0.85 V		E		
DOCUMEN				Ra	w	-					
DATE						DRAW	FTP-642MCL301/3 PRODUCT SPECI	302 FICATIONS 6			
	EDIT D A. T E Design	DESIGN CHE	E C K D (HECK	ESCRI	PTION APPLY		U TAKAMISAWA COMPONENT LIN				
		1						97.01 FDNCA- 9	02-2		



			1					2					3			4	
	A	(6) Notes (1) C p 2) It n 3) C 4) C tl 5) D	on us Contro rintir t is re oise o Contro Contro hermi Do not ins.	e ol the ol ch ecom does ol sur ol sur ol the istor t app	e head b aracters mended not dam rge noise e printe is cut. oly pulse	oard (tl s at a hi to turr nage the e betwe er so th e noise	hermi igh pi i VH e ther en Vi hat tl that	istor) rintin off if rmal l H and he th is 2 `	tempe g rate the p head. I GND ermal V or g	eratur rinter so th head reate	re wit r is ir nat it l doe r and	thin the n stand does ne s not o d/or 20	e spec by mo ot exco overhe ns or	ified temp de so tha eed 32V. eat if a li more to	perature if t ions and ine to the the signal		A
	в	6) It tl tl 7) C 8) It v 9) T	t is ro herma he oth Contro nstall oltage 'urn o	ecom al he her si ol the an e and on the	mended ad using ignal lin e CLK, L alumin l 33 μF l e VDD fi	to rout g wires nes. AT, DII um ele between irst, the	te the 300r N, an ectrol n VDl en the	e lines mm or nd STI ytic (D and e VH.	s from r less 3 signa capaci l GND Tur	VH and 1 als us tor w to pro n off t	to the 5mΩ ing th ith a event the V	e thern or less he C-M approxi t noise. H first	nal he s that OS (7- imatel , then	ad and G are separ 4HC240 o y 15 V the VDD.	ND to the rated from r similar). withstand		В
	С																с
ECTION)																D
DOCUMENT CONTROL SE	ſ																E
DATE		EDIT D.A.T.E. DESIGN	DES	IGN	C H E C K Check		D E \$	s c r i	PTIQ APPLY	N		TITLE F P Draw No. FUJITSU TA	TP-64 <u>RODU</u> A1NA(Kamisaw	2MCL301 JCT SPEC 02243-030 A COMPONENT I	/302 CIFICATIC 1/6	2/12	F
	•	* <u></u>	1												97.01 FDN(0 4- 902- 2	



item Symbol Minimum Typical Maximum Unit Conditions Average resistance Rave 1275 1500 1725 Ω	T.	a 1 7					
Average resistance Value Rave Value I275 I500 I725 Ω Output supply Voltage Vset - 24.0 27.0 V Standard printing conditions The maximum rating is 27.0 V. Supply voltage VD 4.5 5.00 5.5 V High input voltage Vil 0.8xVDD - VDD V Standard printing conditions The maximum rating is 27.0 V. High input current Ih - - 1.0 µA DI Low input current Ih - - 13.0 µA CLK, LAT Iow input current Ih - - 10.0 µA DI Driver leakage IL - - 10.0 µA VD=5.0V, VH=27V Current - - 5.00 MHz - - Timing chart." Driver saturation Voon - - ns Same as above - Driver saturation To - ns Same as above - <th>ltem</th> <th>Symbol</th> <th>Minimum</th> <th>Typical</th> <th>Maximum</th> <th>Unit</th> <th>Conditions</th>	ltem	Symbol	Minimum	Typical	Maximum	Unit	Conditions
Output supply Voltage Vset . 24.0 27.0 V Standard printing conditions The maximum rating is 27.0 V. Supply voltage VDD 4.5 5.00 5.5 V High input voltage Vih 0.8xVDD VDD V ENB, DI, LAT, CLK Low input voltage Vil 0.0 . 0.2XVDD V Same as above High input current 10 . . 13.0 µA CLK, LAT Low input voltage III Low input current III Driver leakage IL Driver saturation Voon . . 2.0 V VDD=5.0V, VH=27V Maximum transfer fd 	Average resistance Value	Rave	1275	1500	1725	Ω	
Supply voltage VDD 4.5 5.00 5.5 V High input voltage Vil 0.8xVDD - VDD V ENB, DI, LAT, CLK Low input voltage Vil 0.0 - 0.2xVDD V Same as above High input current Iih - - 13.0 µA CLK, LAT Low input current Iil - - - 13.0 µA ENB Low input current Iil - <td>Output supply Voltage</td> <td>Vset</td> <td>-</td> <td>24.0</td> <td>27.0</td> <td>V</td> <td>Standard printing conditions The maximum rating</td>	Output supply Voltage	Vset	-	24.0	27.0	V	Standard printing conditions The maximum rating
Supply voltage VDD 4.3 3.00 3.3 V ENB, DI, LAT, CLK, Low input voltage Vil 0.8XVDD V Same as above High input current Iih - - 1.0 µA DI - - 13.0 µA CLK, LAT -	Course la coulta da	VDD	4 5	5.00		V	is 27.0 V.
Портиги voltage VII 0.00 - 0.2XVDD V Same as above High input current Iih - - 1.0 µA DI - - 13.0 µA CLK, LAT - - - 13.0 µA CLK, LAT - - - - 13.0 µA CLK, LAT - - - - - - - 13.0 µA CLK, LAT - <td< td=""><td>Supply voltage</td><td>VDD Vih</td><td>4.3 0.8xVDD</td><td>5.00</td><td>5.5 VDD</td><td>V V</td><td>ENB DI LAT CLK</td></td<>	Supply voltage	VDD Vih	4.3 0.8xVDD	5.00	5.5 VDD	V V	ENB DI LAT CLK
High input current Tih - 1.0 μA DI - - 13.0 μA CLK, LAT - - 52.0 μA ENB Low input current Iil - - - 10.0 μA ENB Driver leakage IL - - - 949.0 μA ENB Driver leakage IL - - 10.0 μA ENB Driver saturation Voon - - 2.0 V VDD=5.0V, VI=27V Outage - - 5.0 MHz - - Frequency - - 5.0 MHz - - Data setup time T1 70.0 - - ns Same as above Latch pulse width T4 200.0 - - ns Same as above Strobe setup time T5 - - μS Same as above Time	Low input voltage	Vil	0.0XVDD	-	0.2xVDD	V	Same as above
. 13.0 µA CLK, LAT Low input current Iil - - 52.0 µA ENB Low input current Iil - - - 10.0 µA DI Driver leakage IL - - - -949.0 µA ENB Driver saturation Von - - - -949.0 µA ENB Ourser saturation Von - <td< td=""><td>High input current</td><td>Iih</td><td>-</td><td>-</td><td>1.0</td><td>μA</td><td>DI</td></td<>	High input current	Iih	-	-	1.0	μA	DI
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$			-	-	13.0	μA	CLK, LAT
Low input current Iil - - -1.0 µA DI - - -13.0 µA CLK, LAT Driver leakage IL - - -949.0 µA ENB Driver saturation Voon - - 10.0 µA VDD=5.0V, VH=27V Driver saturation Voon - - 5.0 MHz Frequency Data setup time T1 70.0 - - ns Saere as above Latch setup time T3 300.0 - - ns Same as above Latch pulse width T4 200.0 - ns Same as above Strobe setup time T3 300.0 - - ns Same as above Propagation delay T6 - - 3.0 µs Same as above Propagation delay T7 - - 3.0 µs Same as above Time - - 3.0 µs </td <td></td> <td></td> <td>-</td> <td>-</td> <td>52.0</td> <td>μΑ</td> <td>ENB</td>			-	-	52.0	μΑ	ENB
- - -13.0 μA CLK, LAT Driver leakage IL - - -949.0 μA VDD=5.0V, VH=27V Oriver saturation Voon - - 2.0 V VDD=5.0V, VH=27V Driver saturation Voon - - 2.0 V VDD=5.0V, VI=27V Maximum transfer fd - - 5.0 MHz Prequency - - 5.0 MHz Data setup time T1 70.0 - ns Same as above Latch setup time T3 300.0 - - ns Same as above Latch pulse width T4 200.0 - ns Same as above Strobe setup time T5 1.5 - μs Same as above Time - 3.0 μs Same as above - Propagation delay T6 - - 3.0 μs Same as above Time - <	Low input current	Iil	-	-	-1.0	μΑ	DI
Driver leakage IL - - - - 494.0.0 μA VIDB Driver saturation Voon - - 2.0 V VDD=5.0V, VH=27V Driver saturation Voon - - 2.0 V VDD=5.0V, VID=45mA Maximum transfer fd - - 5.0 MHz - Data setup time T1 70.0 - - ns Same as above Latch pulse width T4 200.0 - - ns Same as above Strobe setup time T3 300.0 - - ns Same as above Strobe setup time T5 1.5 - - μs Same as above Time T7 - - 3.0 μs Same as above Time - - 3.0 μs Same as above Time - - 3.0 μs Same as above Time - - <td></td> <td></td> <td>-</td> <td>-</td> <td>-13.0</td> <td>μA</td> <td>CLK, LAT</td>			-	-	-13.0	μA	CLK, LAT
Driver reakage II. - - 10.0 µA YDD=3.0V, VH=2/V Driver saturation Voon - - 2.0 V VDD=5.0V, VH=2/V Maximum transfer fd - - 5.0 MHz Frequency - - 5.0 MHz - Data setup time T1 70.0 - - ns Sace Figure 4, "Timing chart." Data setup time T2 30.0 - - ns Same as above Latch bulse width T4 200.0 - - ns Same as above Strobe setup time T5 1.5 - - µs Same as above Propagation delay T6 - - 3.0 µs Same as above Time - - 3.0 µs Same as above - Time - - - 3.0 µs Same as above	Driver le alta da	TT	-	-	-949.0	μΑ	ENB
Driver saturation voltage Voon - 2.0 V VDD=5.0V, VID=45mA Maximum transfer fd - - 5.0 MHz Frequency - - 5.0 MHz Data setup time T1 70.0 - - ns See Figure 4, "Timing chart." Data setup time T2 30.0 - - ns Same as above Latch setup time T3 300.0 - - ns Same as above Latch pulse width T4 200.0 - - ns Same as above Strobe setup time T5 1.5 - - µs Same as above Time 70.0 - - 3.0 µs Same as above Propagation delay T6 - - 3.0 µs Same as above Time T7 - - 3.0 µs Same as above Propagation delay T7 - - 3.0 µs Same as above Time - - - <	Driver leakage	IL	-	-	10.0	μA /dot	$VDD=3.0V, V\Pi=27V$
Maximum transfer Frequency fd - - 5.0 MHz Data setup time T1 70.0 - ns See Figure 4, "Timing chart." Data bolding time T2 30.0 - - ns Same as above Latch pulse width T4 200.0 - - ns Same as above Latch pulse width T4 200.0 - - ns Same as above Strobe setup time T5 1.5 - - µs Same as above Propagation delay T6 - - 3.0 µs Same as above Time 7 - - 3.0 µs Same as above Time 7 - - 3.0 µs Same as above	Driver saturation voltage	Voon	-	-	2.0	V	VDD=5.0V, VIo=45mA
Data setup time T1 70.0 - - ns See Figure 4, "Timing chart." Data holding time T2 30.0 - - ns Same as above Latch setup time T3 300.0 - - ns Same as above Latch pulse width T4 200.0 - - ns Same as above Strobe setup time T5 1.5 - - µs Same as above Propagation delay T6 - - 3.0 µs Same as above Propagation delay T7 - - 3.0 µs Same as above Time - - - 3.0 µs Same as above Time - - - - -	Maximum transfer Frequency	fd	-	-	5.0	MHz	
Data holding time T2 30.0 - ns Same as above Latch setup time T3 300.0 - ns Same as above Latch pulse width T4 200.0 - ns Same as above Strobe setup time T5 1.5 - - µs Same as above Propagation delay T6 - - 3.0 µs Same as above Propagation delay T7 - - 3.0 µs Same as above Time - - 3.0 µs Same as above	Data setup time	T1	70.0	-	-	ns	See Figure 4, "Timing chart."
Latch setup time T3 300.0 - - ns Same as above Latch pulse width T4 200.0 - - ns Same as above Strobe setup time T5 1.5 - - µs Same as above Propagation delay T6 - - 3.0 µs Same as above Propagation delay T7 - - 3.0 µs Same as above Time - - 3.0 µs Same as above Time - - 3.0 µs Same as above Time - - 3.0 µs Same as above	Data holding time	T2	30.0	-	-	ns	Same as above
Latch pulse width T4 200.0 - - ns Same as above Strobe setup time T5 1.5 - - µs Same as above Propagation delay T6 - - 3.0 µs Same as above Propagation delay T7 - - 3.0 µs Same as above Propagation delay T7 - - 3.0 µs Same as above Time - - 3.0 µs Same as above	Latch setup time	T3	300.0	-	-	ns	Same as above
Strobe setup time T5 1.5 - - µs Same as above Propagation delay T6 - - 3.0 µs Same as above Propagation delay T7 - - 3.0 µs Same as above Propagation delay T7 - - 3.0 µs Same as above Time - - 3.0 µs Same as above	Latch pulse width	T4	200.0	-	-	ns	Same as above
Propagation delay Time T6 - - 3.0 μs Same as above Propagation delay Time T7 - - 3.0 μs Same as above Time T7 - - 3.0 μs Same as above	Strobe setup time	T5	1.5	-	-	μs	Same as above
Propagation delay T7 - 3.0 µs Same as above Time - 3.0 µs Same as above	Propagation delay Time	T6	-	-	3.0	μs	Same as above
Image: state of the state	Propagation delay Time	Τ7	-	-	3.0	μs	Same as above
Int:: FTP-642MCL301/302 PRODUCT SPECIFICATIONS DRAW No. DRAW No. A1NA02243-0301/6							
ITTLE FTP-642MCL301/302 PRODUCT SPECIFICATIONS DRAW No. A1NA02243-0301/6							
Image: State of the state							
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TITLE FTP-642MCL301/302 PRODUCT SPECIFICATIONS DRAW No. A1NA02243-0301/6							
DRAW No. A1NA02243-0301/6					TITLE	FTP-64 דרח PR	2MCL301/302 ICT SPECIFICATIONS
					DRAW No.	A1NA	02243-0301/6





		1	2 3	4
		a. At s	standard drive	
		Printing datra		
	ĸ	Clock		
		Latch		
		Strobe 1		⊢
		Strobe 2		
	В	Strobe 3		В
		Strobe 4		
		Strobe 5		
		L 44 1		
	С	D. At f		С
		Clock		
		Latak		
		Latti		
		Strobe 1		
	C	Strobe 2		D
NO		Strobe 3		
SECT		Strobe 4		
ONTROL		Strobe 5		
ENT CI		Note: The l	head current consumption increases at high-speed drive.	E
DDCUM			Figure 7 Control timing	
<u></u> ш				
DA			IIIL: FTP-642MCL301/302 PRODUCT SPECIFICATION DRAW No. A1NA02243 0301/6	S Ist
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Temperature characteristics of FTP-6x2MCL series thermistor and application width Temperature Thermistor resistance value (kΩ) Printing speed 80 mm/sec Printing speed 50 mm/sec Printing speed 30 mm/sec 0 100.090 0.867 0.310 1.009 0.360 1.245 0. (ms) 0 100.090 0.867 0.278 0.904 0.322 1.186 0. 10 06.057 0.777 0.278 0.904 0.284 1.186 0. 20 37.61 0.682 0.244 0.794 0.284 0.946 30 24.11 0.568 0.224 0.774 0.284 0.948 40 15.89 0.538 0.214 0.696 0.249 0.787 0.274 50 10.75 0.493 0.166 0.539 0.213 0.188 0.651 0.35 30 10.75 0.493 0.166 0.539 0.193 0.685 0.30 30 10.75 0.493 0.166 0.539	Г	1	I		2		3			4
4 Temporature value (kΩ) Printing speed 80 mm/sec Printing speed box mm/sec <td></td> <td>Temperature c</td> <td>haracteristic</td> <td>s of FTP-6x</td> <td>2MCL se</td> <td>ries thermi</td> <td>istor and ap</td> <td>plication w</td> <td>idth</td> <td></td>		Temperature c	haracteristic	s of FTP-6x	2MCL se	ries thermi	istor and ap	plication w	idth	
μ value (kΩ) (m) Applica- tion (m) Energy (m) Applica- tion (m) Energy (m) Applica- tion (m)<	A	Temperature	resistance	80 m	nm/sec	50 r	nm/sec	30 n	nm/sec	4
Image: constraint of the second se			value (kΩ)	Applica- tion width	Energy (mj)	Applica- tion width	Energy (mj)	Applica- tion width	Energy (mj)	
0 100.99 0.867 0.310 1.099 0.360 1.245 0. 10 60.57 0.777 0.278 0.904 0.323 1.116 0.323 20 37.61 0.682 0.244 0.794 0.2284 0.904 0.323 1.116 0.322 20 37.61 0.682 0.244 0.794 0.2284 0.906 0.2 0.916 0.33 20 37.61 0.682 0.241 0.696 0.244 0.986 0.33 30 24.11 0.598 0.214 0.696 0.234 0.869 0.33 40 15.89 0.538 0.192 0.626 0.224 0.773 0.2 50 10.75 0.493 0.176 0.574 0.205 0.708 0.2 55 8.92 0.478 0.171 0.566 0.193 0.665 0.2 60 7.45 0.433 0.156 0.504 0.180 0.622 <td></td> <td></td> <td></td> <td>(ms)</td> <td></td> <td>(ms)</td> <td></td> <td>(ms)</td> <td></td> <td></td>				(ms)		(ms)		(ms)		
δ 77.85 0.822 0.294 0.3966 0.342 1.180 0. 10 60.57 0.777 0.278 0.904 0.323 1.116 0. 20 37.61 0.682 0.244 0.794 0.2285 0.916 0. 25 30.00 0.638 0.228 0.742 0.2265 0.916 0. 30 24.11 0.598 0.214 0.696 0.249 0.859 0. 40 15.89 0.563 0.201 0.655 0.234 0.808 0. 50 10.75 0.493 0.192 0.626 0.224 0.773 0. 55 8.92 0.478 0.171 0.556 0.199 0.687 0. 55 8.92 0.478 0.171 0.556 0.199 0.687 0. 60 7.45 0.463 0.162 0.539 0.193 0.6651 0. 70 5.27 0.438		0	100.99	0.867	0.310	1.009	0.360	1.245	0.445	
Image: second system Image: se		5	77.85	0.822	0.294	0.956	0.342	1.180	0.422	
Image: bit is a standard paper (PD150R) Image: bit is a standard paper (PD150R) Image: bit is a standard paper (PD150R) B Image: bit is a standard paper (PD150R) Average resistance value : 1500 Ω Image: bit is a standard paper (PD150R) C Image: bit is a standard paper (PD150R) Average resistance value : 1500 Ω Image: bit is a standard paper (PD150R)		10	00.57	0.777	0.278	0.904	0.323	1.110	0.399	
B 25 30.00 0.0302 0.228 0.742 0.2025 0.916 0.1 30 24.11 0.598 0.214 0.696 0.249 0.859 0.1 35 19.51 0.563 0.201 0.655 0.234 0.808 0.1 40 15.89 0.538 0.192 0.626 0.224 0.773 0.1 50 10.75 0.493 0.176 0.574 0.205 0.708 0.1 50 10.75 0.493 0.176 0.574 0.205 0.708 0.1 60 7.45 0.463 0.162 0.527 0.188 0.665 0.1 65 6.27 0.438 0.162 0.527 0.188 0.630 0.1 70 5.27 0.438 0.156 0.510 0.182 0.603 0.1 70 5.27 0.438 0.156 0.510 0.182 0.603 0.1 70 5.27<		20	37.61	0.732	0.202	0.032	0.304	0.980	0.370	
B 30 24.11 0.598 0.214 0.696 0.249 0.859 0. 35 19.51 0.563 0.201 0.655 0.224 0.808 0. 40 15.89 0.538 0.192 0.626 0.224 0.773 0. 45 13.03 0.513 0.183 0.597 0.213 0.737 0. 50 10.75 0.493 0.176 0.574 0.206 0.687 0. 60 7.45 0.463 0.162 0.539 0.193 0.665 0. 65 6.25 0.433 0.155 0.504 0.182 0.630 0. 70 5.27 0.438 0.151 0.493 0.176 0.608 0. 73 4.47 0.433 0.155 0.504 0.182 0.6030 0. 70 5.27 0.438 0.151 0.493 0.176 0.608 0. 80 3.80		25	30.00	0.638	0.228	0.742	0.265	0.916	0.327	
C 35 19.51 0.563 0.201 0.655 0.234 0.808 0.2 0.21 0.773 0. 40 15.89 0.538 0.192 0.626 0.224 0.773 0. 30 10.75 0.493 0.176 0.574 0.205 0.708 0.7 0.737 0. 55 8.92 0.478 0.171 0.556 0.193 0.665 0.2 0.234 0.707 0.773 0. 55 8.92 0.493 0.176 0.574 0.205 0.708 0.7 0.665 0.2 0.234 0.773 0.7 0.665 0.7 0.665 0.7 0.665 0.7 0.665 0.7 0.665 0.7 0.665 0.7 0.665 0.7 0.665 0.7 0.665 0.7 0.665 0.7 0.665 0.7 0.665 0.7 0.608 0.7 75 4.47 0.433 0.155 0.504 0.180 0.622 0.7 80 3.80 0.423 0.176 0.608 0.7 7 0.7	В	30	24.11	0.598	0.214	0.696	0.249	0.859	0.307	E
40 15.89 0.538 0.192 0.626 0.224 0.773 0.173 45 13.03 0.513 0.183 0.597 0.213 0.737 0.173 50 10.75 0.493 0.176 0.597 0.213 0.737 0.176 55 8.92 0.478 0.171 0.556 0.199 0.687 0.165 60 7.45 0.463 0.162 0.527 0.188 0.651 0.132 60 7.45 0.433 0.155 0.504 0.182 0.630 0.162 70 5.27 0.438 0.155 0.504 0.180 0.622 0.176 80 3.80 0.423 0.151 0.493 0.176 0.608 0.176 90000 Image :24 V Paper :Standard paper (PD150R) PROPUCT SPECIFICA 910000 Image :Standard paper (PD150R) PRODUCT SPECIFICA PRODUCT SPECIFICA 91000 Image :A1NA02243-0301		35	19.51	0.563	0.201	0.655	0.234	0.808	0.289	
45 13.03 0.513 0.183 0.597 0.213 0.737 0.1 50 10.75 0.493 0.176 0.574 0.205 0.708 0.1 55 8.92 0.478 0.171 0.556 0.199 0.687 0.1 60 7.45 0.463 0.165 0.539 0.193 0.665 0.1 60 7.45 0.463 0.165 0.527 0.188 0.665 0.1 70 5.27 0.438 0.156 0.510 0.182 0.630 0. 70 5.27 0.438 0.155 0.504 0.180 0.622 0. 80 3.80 0.423 0.151 0.493 0.176 0.608 0. "Condition" Supply voltage : 24 V Paper : Standard paper (PD150R) Average resistance value : 1500 Ω 100000 Intell product specific All product specific All paper PRODUCT Specific All paper PRODUCT Specific All paper PRODUCT SpeciFIC All paper <t< td=""><td></td><td>40</td><td>15.89</td><td>0.538</td><td>0.192</td><td>0.626</td><td>0.224</td><td>0.773</td><td>0.276</td><td></td></t<>		40	15.89	0.538	0.192	0.626	0.224	0.773	0.276	
50 10.75 0.493 0.176 0.574 0.205 0.708 0.1 55 8.92 0.478 0.171 0.556 0.199 0.687 0.1 60 7.45 0.463 0.165 0.539 0.193 0.665 0.193 61 65 6.25 0.433 0.162 0.527 0.188 0.651 0.1 70 5.27 0.438 0.155 0.504 0.180 0.622 0.1 70 5.27 0.438 0.151 0.493 0.176 0.608 0.1 70 5.27 0.438 0.151 0.493 0.176 0.608 0.1 80 0.423 0.151 0.493 0.176 0.608 0.1 "Condition" Supply voltage : 24 V Paper : Standard paper (PD150R) Average resistance value : 1500 Ω Inter FTP-642MCL301/302 PRODUCT SPECIFICA PRODUCT SPECIFICA Bay He A		45	13.03	0.513	0.183	0.597	0.213	0.737	0.263	
Image: constraint of the second se		50	10.75	0.493	0.176	0.574	0.205	0.708	0.253	
60 7.45 0.463 0.165 0.539 0.193 0.665 0.00000000000000000000000000000000000		55	8.92	0.478	0.171	0.556	0.199	0.687	0.245	
c 65 6.25 0.453 0.162 0.527 0.188 0.651 0.: 70 5.27 0.438 0.156 0.510 0.182 0.630 0.: 75 4.47 0.433 0.155 0.504 0.180 0.622 0.: 80 3.80 0.423 0.151 0.493 0.176 0.608 0.: "Condition" Supply voltage : 24 V Paper : Standard paper (PD150R) Average resistance value : 1500 Ω		60	7.45	0.463	0.165	0.539	0.193	0.665	0.238	
C 70 5.27 0.438 0.156 0.510 0.182 0.630 0: 75 4.47 0.433 0.155 0.504 0.180 0.622 0: 80 3.80 0.423 0.151 0.493 0.176 0.608 0: "Condition" Supply voltage : 24 V Paper : Standard paper (PD150R) Average resistance value : 1500 Ω Average resistance value : 1500 Ω		65	6.25	0.453	0.162	0.527	0.188	0.651	0.233	
C 75 4.47 0.433 0.155 0.504 0.180 0.622 0.3 80 3.80 0.423 0.151 0.493 0.176 0.608 0.3 "Condition" Supply voltage : 24 V Paper : Standard paper (PD150R) Average resistance value : 1500 Ω 0 Average resistance value : 1500 Ω		70	5.27	0.438	0.156	0.510	0.182	0.630	0.225	
80 3.80 0.423 0.151 0.493 0.176 0.608 0.380 "Condition" Supply voltage :: 24 V Paper :: Standard paper (PD150R) Average resistance value : 1500 Ω 1	С	75	4.47	0.433	0.155	0.504	0.180	0.622	0.222	
Average resistance value : 1500 Ω NOLOS NOUO		"Condition Supply Paper	" voltage	: 24 V : Stan	dard pape	r (PD150R)				╞
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9. Stepping Motor Specifications

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(1) General specifications (motor as a single unit)

Item	Specification
Туре	Permanent magnetic type
Number of phases	2 phases (bipolar specification)
Step angle	9 $^{\circ}$ at 1-2 phase excitation
Coil resistance/phase	6.0Ω±10%
Rated voltage	DC24 V
Maximum input	1.5 W

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(2) Stepping motor drive method

1) Drive the stepping motor by bipolar 1-2 phase excitation.

2) Number of steps per dot line printed

Excitation method	Number of steps	Rotation angle
1-2 phase excitation	4	9 degrees/step

3) The excitation method for reference is shown below.





			1		2		3		4	
		(4) N	Aotor driv	e condition						
	A		1) In this wavefor drive. D the driv voltage,	motor, coi rm from bei Drive this m ve circuit ex etc.	l resistance is ng dulled by t lotor by a cons cample to obta	s suppresse he L compo tant-curren in stable to	ed low to prevent to ment of the motor co t circuit (up to 500 r rque over resistance	he current rise bil at high-speed nA) according to value variation,		A
			Excessiv mechani	re current g ical unit. Do	generates abno on't allow curre	rmal heat and the	and excessive torque eeds the required to f	e to damage the low.		
		:	2) Check t determi damage	he effect of ning the m the gear at	temperature, h otor drive con paper lock or o	umidity, pa ditions. Mot other.	per type, etc. on load tor drive with excess	variation before ive torque ;may		
	В	:	3) At low-s because lower di	speed drive of motor re rive frequer	(low drive freq esonance. Perfo ncy.	uency), abn rm full eval	ormal noise or torque luation and check to	e drop may occur use a 500 pps or		В
			4) Control at	acceleration	n and decelerat	ion when ra	apidly changing the m	otor drive speed		
			5) printing	g start and v	when starting p	orinting afte	er motor excitation is	turned off.		
	С		6) Perform remove motor e	n dummy fea the effect o xcitation is	ed of several do of the drive tra turned off.	ot lines to n ansmission	natch the motor excit system when startir	ation phase and ag printing after		с
	C									D
CTION										
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			1		2		3		4	
		(5) Note	es							
	A	1) I p n c b b	f the moto wint may notor is re- ontinuity a halfway. The hy feeding r s 150 mA	r is stoppe be separat estarted. P is required te above ru minute curr	d and moto ed because rint crush l, print all bber roller rent in the s	or excitation of the elas or white lin data at on deformation standby stat	is discontinued of ticity of the rubb ne insertion may e time instead of and other effect e. In this case, the	during printing, per roller when occur. When p f stopping prin can also be redu e current as a gu	the the rint ting uced uide	A
		2) T e	Turn off ex lement, or	citation to other may	leave the be heated.	printer unu	used for long time	e. The motor, d	rive	┢
		3) F d	Hold the m amage the	otor side v coil in the	vall temper motor.	ature 90°C	or lower in use.	Excess of 90°C 1	may	
	В	4) V	Vhen an al	onormal co	ndition occu	urs, stop pri	nter drive as early	as possible.		Б
		5) T e s	This printen xcitation, o tart occurs	r feeds one control the in the 2-pl	dot line by motor so th hase excitat	four steps. T nat stop occu tion state to	Therefore, in moto ir in the 1-phase save power and s	r drive by 1-2 pł excitation state tabilize operatio	nase and on.	
		6) P d	Printing op amage the	eration wit head. Don	h no paper I't perform p	and the hea printing in t	d down may wear his condition.	the rubber rolle	er or	
	С									с
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10. Photointerrupter Specifications

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EDIT D E S The main purpose of this photointerrupter is to position the paper by mark detection. This photointerrupter can also be used to detect no paper condition.

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(1) Absolute maximum ratings

	Item	Symbol	Rated value	Unit
	Forward current	IF	50	mA
Input	Reverse voltage	VR	5	V
	Allowable loss	Р	70	mW
	Voltage between collector and emitter	Vceo	20	V
Output	Voltage between emitter and collector	Veco	5	V
output	Collector current	Ic	20	mA
	Collector loss	Pc	70	mW

(2) Electrooptical characteristics

							(25°C)
Item		Symbol	Minimu value	m Typical 1 value	Maximum value	Unit	Conditions
Innut	Forward voltage	VF	1.0	1.2	1.4	V	IF=20 mA
Input	Reverse current	Ir	-	-	10	μA	VR=3 V
Output	Dark current	Iceo	-	-	200	nA	Vce=10 V
Transmission Characteri-	Photoelectric current	Ic	260	-	1100	μA	V _{CE} =5 V, I _F =10 mA
Sucs	Leakage current	Ileak	-	-	1	μA	V _{CE} =5 V, I _F =20 mA
	Response time (rise)	tr	-	5	-	μs	Vce=5 V, Ic=1 mA
	Response time (fall) (fall)	tf	-	5	-	μs	Rl=100Ω

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	14. No	tes for Handling				
	(1)	Notes for paper loadi	ng and unloadi	ng		
A		Load the paper so t (See the figure belo	hat its shaft is w)	s as parallel	with the printer as possible	
		Adjust paper ejecti or other.	on so that it	is ejected	smoothly without hitting t	he cover
-		Without these trea misalignment, and	itments, troul paper jam n	ole such as nay occur ii	paper snaking, printing p n printing.	osition
В						
_		Max <u>0.5mm vi e</u>				
С				Max o. 5°	$\left\{ - \right\}$	-
	(2)	Notes for storage				ŀ
_		For long-time stora and establish hea	age (half yea ad up conditio	r or longer on.	in room temperature), loa	d paper
C		If the rubber rolle for long time, the print darkness.	r remain in e rubber rolle	direct conta r may be p	act with the head and pinc partially deformed to cause	h roller uneven
		Do not place the j with the power o	orinter in an n for long tir	environmer ne to preve	nt in which condensation r nt galvanic corrosion.	nay occur
	(3)	Notes for mounting a	nd setting			
		Secure the printer At this time, supp	by 3 mounti ort the printe	ng holes us er by the s	sing three M3.0 screws. ame plate (flatness : 0.1 o	r less).
		Connect the moun main body.	ting section o	on the moto	or side to the frame groun	d of the
		In securing, take ca	re not to strai	n or deform	the printer body.	
		A violation of thes wavy paper, paper	e notes may jam, and no	cause troul ise.	ble such as blurred printir	ıg,
					FTP-642MCL301/ PRODUCT SPECI	302 FICATIONS
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		(4)	Back tension of re	ecording p	paper			•		
			When using the back tension of	is printe Ethe pap	r with t ber at th	he F&T sta he printer p	andard circuit, adju paper entrance to a	st the pprox.100g		
A			Application of l overload and d	back ten: amage tl	sion tha he gear.	t exceeds 1	00g may cause a p	oaper jam or		A
		(5)	Galvanic corrosic	on						
_	-		If head voltage because of gaiv in which conde	is appli vanic com nsation i	ied with rosion. may occu	the paper Do not pla 1r with the	wet, the head may ce the printer in a power on for long	y be damaged n environment ; time.		
		(6)	Dust and drip							
В			The structure of treatment aga	of this pi inst dust	rinter is t and dr	neither du ips to the	st-proof nor drip-p mainframe side be	coof. Give a forehand.		В
		(7)	Other							
			Lift the head up	o lever wł	nen pape	r is not load	led on the printer.			
_			If the paper run	ns out du	ring prin This cau	ting, stop p ses printer	rinter operation to j failures	prevent		
			princing with no	papen	inib cuu	ses princer				
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	15. O	ther				
	(1)	Both sides shal	ll consult to solve oc	curred proble	ms based on this specification.	
A	(2)	Both sides shal	Il consult to make cha	anges and a	dditions incompatible with this specific	ation.
		In the range on notice because this t	of compatibility, th ype is a standard	iis printer i type.	nay be changed without prior	
_	(3)	Preprinting				
в		Consult on pr beforehand. The ink used, the print qu	eprinting (printing printing method, ality of the therm	on the paj and drying al printer l	per) according to Appendix 1 method of preprinting may affect argely.	t
	(4)	Label feed				
		Do not feed la other because	abels backward by it may cause the	turning the label to ac	e knob in reverse direction or lhere to the inside of printer.	
	(5)	Paper rolling di	rection			
С		Roll the paper insertion eas	r with the heat-set sy and reduce the	nsitive side transport le	on the outside to make paper bad at drive.	
	(6)	Paper perforati	on			
		Perforate pape head life show	er from the heat-se rtening because of	ensitive sid a perforati	e to prevent printing failure or on burr or paper residues.	
	(7)	Head cleaning				
		Paper residues Clean the prin	s or foreign matte nter periodically.	r may shor	ten the life of the head or platen	l.
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		4. Notes for preprinting
	A	The characteristics of heat-sensitive paper differ those of general printing paper and no- carbon paper. Note the following in print processing :
		A. Printing method
		Use the UV printing method because heat-sensitive paper has poor ink dryability.
		B. Ink
		(1) Use ink that doesn't have bad effect such as residue adhesion, head wearing, and sticking or the thermal printer.
	в	(2) Use ink that contains 100 ppm or less of CI ions.
		Recommended ink : RNC type by F&K TOKA
		(3) Take care of the ink tack because the surface strength of the heat-sensitive layer is lower than general printing paper. Use 6.0 as the ink tack for general heat-sensitive paper or the same level as no-carbon paper for high-storage heat-sensitive paper.
		(4) Don't apply an excessive amount of ink. An excessive amount of ink causes printing or coloring failure or sticking.
	С	(5) Use heat-resistant ink material that doesn't perform cooling. Also use such ink for the non- heat-sensitive side.
		(6) After printing, check that the ink adheres to the paper. Manage wetting water carefully because in general, UV ink tends to yield to water.
		(7) Avoid ink transfer and blocking.
		(8) Ensure that the preprint isn't peeled by water or alcohol.
		C. Wetting water
	C	(1) Manage wetting water carefully because heat-sensitive paper tends to repel water.
z		(2) An excessive amount of IPA in the wetting water may cause color smudging to background. adjust the IPA amount to 5% or less for general heat-sensitive paper or 10% or less for high- strong heat-sensitive paper.
SECTIO		D. Other
UTROL :	↑	(1) When using many UV 1amps, take care of paper contraction (flow or width direction) or color smearing because of heat.
່ອ	I	(2) Set the holding roller pressure of the drive roll high because the paper surface is slippery.
UMENT		(3) Perform multiple printing to raise the PCS value of the positioning marker.
DOCI		(4) Some preprinting causes sticking or the like. Be sure to perform evaluation and check on the actual machine.
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