

Structure	Silicon Monolithic Integrated Circuit
Product series	PWM Driver for combi drive
Type	<b>BD7790KVT</b>
Function	<ul style="list-style-type: none"> <li>• 3-phase-sensor-less system, therefore don't need three hall sensors for spindle motor driver.</li> <li>• Stability high-speed start from the state of the stop for spindle motor driver.</li> </ul>

○ Absolute maximum ratings

Parameter	Symbol	Limits	Unit
Power MOS supply voltage	PVcc	6	V
Control circuit power supply voltage	Vcc	6	V
Maximum driver output current	IoMAX	3 # 1	A
Power dissipation	Pd	1.37 # 2	W
Operating temperature range	Topr	-30~85	°C
Storage temperature range	Tstg	-55~150	°C
Joint part temperature	Tjmax	150	°C

#1 The current is guaranteed 3.0A in case of the current is turned on/off in a duty-ratio of less than 1/10 with a maximum on-time of 5ms and when short brake.

#2 PCB (70mm×70mm×1.6mm,occupied copper foil is less than 3%,glass epoxy standard board) mounting. Reduce power by 11.0mW for each degree above 25°C.

○ Recommended operating conditions(Ta=-30~+85°C)

[Set the power supply voltage taking allowable dissipation into considering]

Parameter	Symbol	MIN	TYP	MAX	Unit
Power MOS supply voltage	PVcc	4.0	5.0	5.5	V
Control circuit power supply voltage	Vcc	4.0	5.0	5.5	V

This product described in this specification isn't judged whether it applies to COCOM regulations. Please confirm in case of export.  
This product isn't designed for protection against radioactive rays.

Status of this document

The Japanese version of this document is the formal specification.

A customer may use this translation version only for a reference to help reading the formal version.

If there are any differences in translation version of this document, formal version takes priority.

Application example

•ROHM cannot provide adequate confirmation of patents.

•The product described in this specification is designed to be used with ordinary electronic equipment or devices (such as audio-visual equipment, office-automation equipment communication devices, electrical appliances, and electronic toys).

Should you intend to use this product with equipment or devices which require an extremely high level of reliability and the malfunction of which would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices), please be sure to consult with our sales representative in advance.

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○ Electrical characteristics

(Unless otherwise noted Ta=25°C, Vcc=PVcc=5V, Vref=1.25V, RL(ACT,STP,LOAD)=8Ω+47μH, RL(SP)=2Ω+47μH, RNF=0.2Ω, CTL1,2=3.3V, GVSW=0V, VIN1,2,3,4,5,6=OPEN, VCOM=OPEN, VCCOM=OPEN, VCOUT=OPEN)

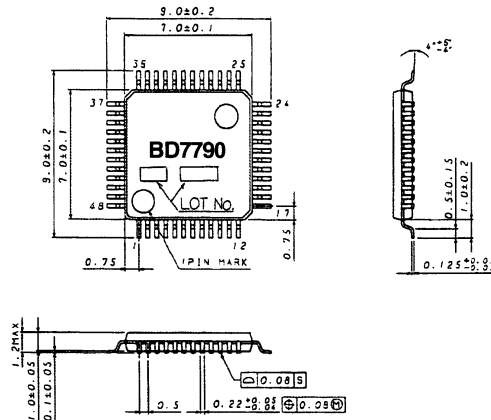
Parameter		Symbol	MIN.	TYP.	MAX.	Unit	Condition
Circuit current	Quiescent current	ICC	—	8	20	mA	CTL1,2=H
	Current in standby mode	IST	—	—	0.2	mA	CTL1,2=L
Actuator driver block	Input dead zone (one side)	VDZACT1,2,3	—	—	3	mV	
	Output offset voltage	VOO1,2,3	-50	—	50	mV	
	Voltage gain (CH1,2,3)	GVC1,2,3	15.5	17.5	19.5	dB	External input resistor 10kΩ
	Output On resistor (top and bottom)	RON1,2,3	—	1.2	1.8	Ω	Io=500mA
	PWM frequency	f1,2,3CH	215	310	405	kHz	
Stepping driver block	Input dead zone (one side)	VDZ4,5	10	30	50	mV	
	Output offset voltage	VOO4,5	-50	—	50	mV	
	Voltage gain	GVC4,5	15.5	17.5	19.5	dB	
	Output On resistor (top and bottom)	RON4,5	—	1.6	2.4	Ω	Io=500mA
	PWM frequency	f4,5CH	215	310	405	kHz	
Loading driver block	Input dead zone (one side)	VDZ6	20	60	100	mV	CTL1=H, CTL2=L
	Output offset voltage	VOO6	-50	—	50	mV	CTL1=H, CTL2=L
	Voltage gain	GVC6	15.5	17.5	19.5	dB	CTL1=H, CTL2=L
	Output On resistor (top and bottom)	RON6	—	1.8	2.7	Ω	Io=500mA, CTL1=H, CTL2=L
	PWM frequency	f6CH	215	310	405	kHz	CTL1=H, CTL2=L
Spindle driver block	Input dead zone of gm1 (one side)	VDZSP1	2	30	100	mV	
	Input dead zone of gm2 (one side)	VDZSP2	6	90	300	mV	GVSW=M
	Input dead zone of gm3 (one side)	VDZSP3	10	150	500	mV	GVSW=H
	Input output gain 1	gm1	0.88	1.1	1.32	AV	
	Input output gain 2	gm2	0.28	0.36	0.44	AV	GVSW=M
	Input output gain 3	gm3	0.17	0.22	0.27	AV	GVSW=H
	Output On resistor (top and bottom)	RONSP	—	0.6	1.4	Ω	Io=500mA
	Output limit voltage	VLIMSP	0.18	0.22	0.26	V	
Others	PWM frequency	fSP	—	167	—	kHz	
	Vref drop mute ON threshold voltage	VMVref	—	0.7	1.0	V	
	Vcc drop mute ON threshold voltage	VMVccD	3.2	3.6	4.0	V	
	CTL1 L voltage	VCTL1L	0	—	1.0	V	
	CTL1 H voltage	VCTL1H	2.0	—	3.3	V	
	CTL2, GVSW L voltage	VCTL2L, VGVL	0	—	1.0	V	
	CTL2, GVSW M(Hi-z) voltage	VCTL2M, VGVM	1.6	—	2.0	V	OPEN (Hi-z) is also available.
CTL2, GVSW H voltage	VCTL2H, VG VH	2.6	—	3.3	V		

GVSW	L	M (Hi-z)	H
Gain mode	gm1	gm2	gm3

CTL1	CTL2	Brake mode	SPINDLE Output	CH1,2,3 Output	CH4,5 Output	CH6 Output
L	L	—	Hi-Z	Hi-Z	Hi-Z	Hi-Z
	M	Short brake	ACTIVE	Hi-Z	Hi-Z	Hi-Z
	H		ACTIVE	ACTIVE	ACTIVE	Hi-Z
H	L	Reverse brake	Hi-Z	Hi-Z	ACTIVE	ACTIVE
	M (Hi-z)		ACTIVE	Hi-Z	Hi-Z	Hi-Z
	H		ACTIVE	ACTIVE	ACTIVE	Hi-Z

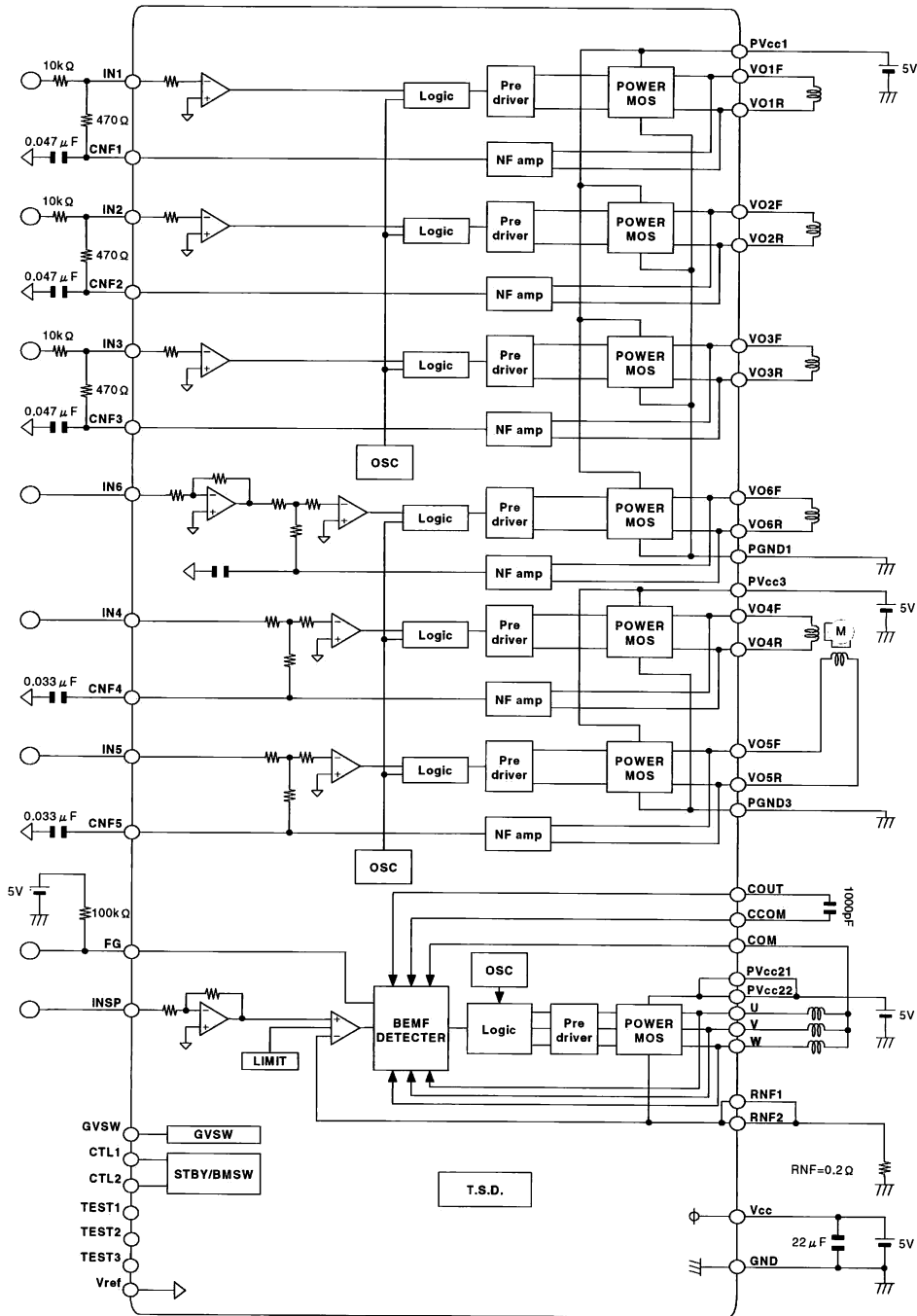
Please supply the middle level voltage for CTL2 when using it in the mode of CTL1=L and CTL2=M.

○ Package outlines



(UNIT : mm)

○Block diagram / Application circuit



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