



# Motor / Actuator Drivers

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# DC Brush Motor Drivers

**A Motor / Actuator Drivers**

7V Max. H-Bridge Drivers BD621xseries											
Part No.	CH	Supply Voltage (V)	Output Current (A)	Input Threshold Voltage		Output ON Resistance(Ω Typ.)	Output Modes	Package			
				H Level(V)	L Level(V)						
BD6210F	1	3.0 to 5.5	0.5	2.0 or more	0.8 or less	1.0	Forward/Reverse/Standby(Idle)/Brake		SOP8		
BD6210HFP										HRP7	
BD6211F			1.0							SOP8	
BD6211HFP										HRP7	
BD6212FP			2.0							HSOP25	
BD6212HFP										HRP7	
18V Max. H-Bridge Drivers BD622xseries											
BD6220F	1	6.0 to 15.0	0.5	2.0 or more	0.8 or less	1.5	Forward/Reverse/Standby(Idle)/Brake		SOP8		
BD6221F			1.0							SOP8	
BD6222FP			2.0							HSOP25	
BD6222HFP										HRP7	
BD6225FP			2						0.5		HSOP25
BD6226FP									1.0		HSOP25
36V Max. H-Bridge Drivers BD623xseries											
BD6230F	1	6.0 to 32.0	0.5	2.0 or more	0.8 or less	1.5	Forward/Reverse/Standby(Idle)/Brake		SOP8		
BD6231F			1.0							SOP8	
BD6231HFP										HRP7	
BD6232FP			2.0							HSOP25	
BD6232HFP										HRP7	
BD6236FP			2						1.0		HSOP25
BD6236FM	1.5			HSOP-M28							
BD6237FM	2.0			HSOP-M28							
50V Max. H-Bridge Driver											
Part No.	Maximum Voltage (V)	Supply Voltage (V)	Output Current (A)	Number of Channel	Output ON Resistance (upper + lower)(Ω Typ.)	Output Modes	Operating Temperature Range(°C)	Package			
BD6941FM	50	8.0 to 16.0	1.25	1	1.68	Forward / Reverse / Standby / Brake	-40 to +105	HSOP-M36			
H-Bridge Drivers High-Current Series											
Part No.	CH	Supply Voltage (V)	Output Current (A)	Input Threshold Voltage		Output ON Resistance(Ω Typ.)	Output Modes	Package			
				H Level(V)	L Level(V)						
BD62222HFP	1	6.0 to 27.0	2.5	2.0 or more	0.8 or less	1.0	Forward/Reverse/Standby(Idle)/Brake		HRP7		
BD62321HFP		6.0 to 32.0	3.0								
36V Max. H-Bridge Drivers Current limit series											
<b>New</b> BD62220EFV	2	8.0 to 28.0	2.0	2.0 or more	0.8 or less	0.65	Forward/Reverse/Standby(Idle)/Brake		HTSSOP-B28		
<b>New</b> BD62210EFV			1.0			1.9			HTSSOP-B28		
H-Bridge Drivers High-Speed Series											
Part No.	CH	Supply Voltage (V)	Output Current (A)	Input Threshold Voltage		Output ON Resistance (Ω Typ.)	Output Modes	SR CONT	Package		
				H Level(V)	L Level(V)						
BD65491FV	1	1.8 to 16.0	1.2 peak4.0	1.45 or more	0.5 or less	0.35	Forward/Reverse/Standby(Idle)/Brake	✓	SSOP-B16		
BD65492MUV	2	1.8 to 16.0	1.0	1.45 or more	0.5 or less	0.9	Forward/Reverse/Standby(Idle)/Brake	-	VQFN024V4040		
BD65494MUV	1	2.0 to 9.0	1.0 peak2.5	2.0 or more	0.7 or less	0.55	Forward/Reverse/Standby(Idle)/Brake	-	VQFN016V3030		
BD65496MUV	1	1.8 to 16.0	1.2 peak5.0	1.45 or more	0.5 or less	0.35	Forward/Reverse/Standby(Idle)/Brake	✓	VQFN024V4040		
Reversible Motor Drivers with Speed Control											
Part No.	Supply Voltage (V)	Output Current (A)	Input Threshold Voltage		Output Saturation Voltage (V Typ.)	Output Modes	保護回路	Package			
			H Level(V)	L Level(V)							
BA6950FS	3 to 16	0.4	2.0 or more	0.8 or less	0.16 (I <sub>o</sub> =0.05A)	Forward/Reverse/Idle/Brake	TSD	SSOP-A16			
BA6951FS	3 to 16	0.8	2.0 or more	0.8 or less	0.6 (I <sub>o</sub> =0.3A)	Forward/Reverse/Idle/Brake	TSD/OCF	SSOP-A16			
1.0A Reversible Motor Drivers (Single Motor)											
Part No.	Supply Voltage (V)	Output Current (A)	Input Threshold Voltage		Output Saturation Voltage (V Typ.)	Output Modes	Package				
			H Level(V)	L Level(V)							
BA6956AN	6.5 to 15	1.0	2.0 or more	0.8 or less	1.7 (I <sub>o</sub> =0.2A)	Forward/Reverse/Idle/Brake	SIP9				
BA6287F	4.5 to 15	1.0	2.0 or more	0.8 or less	1.0 (I <sub>o</sub> =0.2A)	Forward/Reverse/Idle/Brake	SOP8				
BA6285FS	4.5 to 15	1.0	2.0 or more	0.8 or less	1.0 (I <sub>o</sub> =0.2A)	Forward/Reverse/Idle/Brake	SSOP-A16				
BA6285AFP-Y	4.5 to 24	1.0	2.0 or more	0.8 or less	1.0 (I <sub>o</sub> =0.2A)	Forward/Reverse/Idle/Brake	HSOP25				
BA6920FP-Y	6.5 to 34	1.0	3.0 or more	0.8 or less	2.2 (I <sub>o</sub> =0.02A)	Forward/Reverse/Idle/Brake	HSOP25				
2.0A or More Reversible Motor Drivers (Single Motor)											
BA6219BFP-Y	8 to 18	2.2	3.0 or more	1.0 or less	2.4 (I <sub>o</sub> =0.4A)	Forward/Reverse/Idle/Brake	HSOP25				
BA6222	8 to 18	2.2	3.0 or more	1.0 or less	2.4 (I <sub>o</sub> =0.4A)	Forward/Reverse/Idle/Brake	HSIP10				

1.0A or More Reversible Motor Drivers (2 Motors)							
Part No.	Supply Voltage (V)	Output Current (A)	Input Threshold Voltage		Output Saturation Voltage (V typ.)	Output Modes	Package
			H Level(V)	L Level(V)			
BA6247FP-Y	8 to 18	1.0	3.5 or more	1.0 or less	2.4 (I <sub>o</sub> =0.5A)	Forward/Reverse/Brake	HSOP25
BA6238A	8 to 18	1.6	4.0 or more	1.0 or less	2.3 (I <sub>o</sub> =0.5A)	Forward/Reverse/Brake	HSIP10

# Stepper Motor Drivers

High Performance, High Reliability 36V Stepper Motor Drivers For PPCs, MFPs, Industrial equipments etc.

BD63730EFV																		
BD6387EFV																		
BD6385EFV																		
BD6383EFV																		
BD6389FM																		
BD63876EFV																		
BD63874EFV																		
BD63872EFV																		
BD63720AEFV																		
BD63715AEFV																		
BD63710AEFV																		

\* 1 The BD6387EFV, BD6385EFV, BD6383EFV, and BD6389FM are all function-compatible. \* 2 The BD6387EFV, BD6385EFV, and BD6383EFV are all pin-compatible.  
 \* 3 The BD63876EFV, BD63874EFV, and BD63872EFV are all function-compatible. \* 4 The BD63876EFV, BD63874EFV, and BD63872EFV are all pin-compatible.  
 \* 5 The BD63720AEFV, BD63715AEFV, and BD63710AEFV are all function-compatible. \* 6 The BD63720AEFV, BD63715AEFV, and BD63710AEFV are all pin-compatible.

Part No.	Supply Voltage(V)	Output Current (A)	Circuit Current (mA)	Input Threshold Voltage		Output ON Resistance (Ω)	Package
	V <sub>CC</sub>			High Level Voltage(V)	Low Level Voltage(V)		
BD63730EFV	19 to 28	3.0	2.0	2.0	0.8	0.4	HTSSOP-B54
BD6387EFV	10 to 28	2.0	4.5	2.0	0.8	0.8	HTSSOP-B40
BD6385EFV	10 to 28	1.5	4.5	2.0	0.8	1.0	HTSSOP-B40
BD6383EFV	10 to 28	1.0	4.5	2.0	0.8	1.5	HTSSOP-B40
BD6389FM	10 to 28	2.2	4.5	2.0	0.8	0.7	HSOP-M36
BD63876EFV	19 to 28	2.0	2.0	2.0	0.8	0.65	HTSSOP-B28
BD63874EFV	19 to 28	1.5	2.0	2.0	0.8	1.0	HTSSOP-B28
BD63872EFV	19 to 28	1.0	2.0	2.0	0.8	1.9	HTSSOP-B28
<b>New</b> BD63720AEFV	19 to 28	2.0	2.0	2.0	0.8	0.65	HTSSOP-B28
<b>New</b> BD63715AEFV	19 to 28	1.5	2.0	2.0	0.8	0.95	HTSSOP-B28
<b>New</b> BD63710AEFV	19 to 28	1.0	2.0	2.0	0.8	1.2	HTSSOP-B28

	Control signal input CLK-IN type	Control signal input PARALLEL-IN type	Iomax 1.0A	Iomax 1.5A	Iomax 2.0A	Iomax 2.2A	Iomax 3.0A	Maximum output current	Number of step	Constant-current PWM	Switch able between forward and reverse	1 power supply system due to built-in regulator	Built-in thermal shut-down circuit
	SLOW/FAST/MIX DECA switching function	Thin package	Small power package	Function-compatible	Easy replacement pin compatible with competitor's	1 power supply system due to built-in regulator	Built-in thermal shut-down circuit	4kV	6kV	8kV	ESD resistance	Adjacent pin short protection	Inverse mounting protection

## Standard 36V Stepper Motor Drivers

<b>BD6395FP</b>	PARAMETER: I <sub>max</sub> 1.5A, 1/2STEP	FUNCTIONS: FWRW, DECA SW, THIN PKG, SMALL SIZE PACKAGE, ONE POWER, T.S.D., O.C.P., UV, OVLO, 4kV, FUNCTION COMPATIBLE, EPINE
<b>BD6393FP</b>	PARAMETER: I <sub>max</sub> 1.2A, 1/2STEP	FUNCTIONS: FWRW, DECA SW, THIN PKG, SMALL SIZE PACKAGE, ONE POWER, T.S.D., O.C.P., UV, OVLO, 4kV, FUNCTION COMPATIBLE, EPINE
<b>BD6290EFV</b>	PARAMETER: I <sub>max</sub> 0.8A, 1/2STEP	FUNCTIONS: FWRW, DECA SW, THIN PKG, SMALL SIZE PACKAGE, ONE POWER, T.S.D., O.C.P., UV, OVLO, 4kV, FUNCTION COMPATIBLE, EPINE
<b>BD63960EFV</b>	PARAMETER: I <sub>max</sub> 1.5A, 1/2STEP	FUNCTIONS: FWRW, DECA SW, THIN PKG, SMALL SIZE PACKAGE, ONE POWER, T.S.D., O.C.P., UV, OVLO, 4kV, SHORT PROTECTION, FUNCTION COMPATIBLE, EPINE
<b>BD63940EFV</b>	PARAMETER: I <sub>max</sub> 1.2A, 1/2STEP	FUNCTIONS: FWRW, DECA SW, THIN PKG, SMALL SIZE PACKAGE, ONE POWER, T.S.D., O.C.P., UV, OVLO, 4kV, SHORT PROTECTION, FUNCTION COMPATIBLE, EPINE
<b>BD63801EFV</b>	CLK IN: I <sub>max</sub> 0.8A, 1/2STEP	FUNCTIONS: FWRW, DECA SW, THIN PKG, SMALL SIZE PACKAGE, ONE POWER, T.S.D., O.C.P., UV, OVLO, 4kV, SHORT PROTECTION, FUNCTION COMPATIBLE, EPINE

\*1 The BD6395FP, BD6393FP, and BD6290EFV are all function-compatible. \*2 The BD6395FP and BD6393FP are all pin-compatible.  
 \*3 The BD63960EFV, BD63940EFV, and BD63801EFV are all function-compatible. \*4 The BD63960EFV and BD63940EFV are all pin-compatible.

Part No.	Supply Voltage(V)		Output Current (A)	Circuit Current (mA)	Input Threshold Voltage		Output ON Resistance (Ω)	Package
	V <sub>cc</sub>	V <sub>m</sub>			High Level Voltage(V)	Low Level Voltage(V)		
BD6395FP	16 to 28		1.5	3.0	2.0	0.8	1.2	HSOP25
BD6393FP	16 to 28		1.2	3.0	2.0	0.8	1.5	HSOP25
BD6290EFV	19 to 28		0.8	3.0	2.0	0.8	2.8	HTSSOP-B24
BD63960EFV	19 to 28		1.5	2.7	2.0	0.8	1.1	HTSSOP-B24
BD63940EFV	19 to 28		1.2	2.7	2.0	0.8	1.4	HTSSOP-B24
BD63801EFV	19 to 28		0.8	2.7	2.0	0.8	2.8	HTSSOP-B24

## Microstep 36V Stepper Motor Drivers

<b>BD63860EFV</b>	CLK IN: I <sub>max</sub> 2.5A, 1/2STEP	FUNCTIONS: FWRW, DECA SW, THIN PKG, SMALL SIZE PACKAGE, ONE POWER, T.S.D., O.C.P., UV, OVLO, 4kV, FUNCTION COMPATIBLE, EPINE
<b>BD63847EFV</b>	CLK IN: I <sub>max</sub> 2.0A, 1/2STEP	FUNCTIONS: FWRW, DECA SW, THIN PKG, SMALL SIZE PACKAGE, ONE POWER, T.S.D., O.C.P., UV, OVLO, 8kV, SHORT PROTECTION, FUNCTION COMPATIBLE, EPINE
<b>BD63843EFV</b>	CLK IN: I <sub>max</sub> 1.0A, 1/2STEP	FUNCTIONS: FWRW, DECA SW, THIN PKG, SMALL SIZE PACKAGE, ONE POWER, T.S.D., O.C.P., UV, OVLO, 8kV, SHORT PROTECTION, FUNCTION COMPATIBLE, EPINE

\*1 The BD63847EFV and BD63843EFV are all function-compatible.

Part No.	Supply Voltage(V)		Output Current (A)	Circuit Current (mA)	Input Threshold Voltage		Output ON Resistance (Ω)	Package
	V <sub>cc</sub>	V <sub>m</sub>			High Level Voltage(V)	Low Level Voltage(V)		
BD63860EFV	16 to 28		2.5	4.0	2.0	0.8	0.8	HTSSOP-B28
BD63847EFV	19 to 28		2.0	2.5	2.0	0.8	0.85	HTSSOP-B28
BD63843EFV	19 to 28		1.0	2.5	2.0	0.8	1.9	HTSSOP-B28

## Low Voltage Stepper Motor Drivers for Mini and Handheld Printers

<b>BD6382EFV</b>	PARAMETER: I <sub>max</sub> 0.8A, 1/2STEP	FUNCTIONS: FWRW, DECA SW, THIN PKG, SMALL SIZE PACKAGE, ONE POWER, T.S.D., O.C.P., UV, OVLO, 4kV, SHORT PROTECTION, STAND-BY CURRENT, FUNCTION COMPATIBLE, EPINE, -40~+85°C
<b>BD6381EFV</b>	PARAMETER: I <sub>max</sub> 1.2A, 1/2STEP	FUNCTIONS: FWRW, DECA SW, THIN PKG, SMALL SIZE PACKAGE, ONE POWER, T.S.D., O.C.P., UV, OVLO, 4kV, SHORT PROTECTION, STAND-BY CURRENT, FUNCTION COMPATIBLE, EPINE
<b>BD6380EFV</b>	PARAMETER: I <sub>max</sub> 0.8A, 1/2STEP	FUNCTIONS: FWRW, DECA SW, THIN PKG, SMALL SIZE PACKAGE, ONE POWER, T.S.D., O.C.P., UV, OVLO, 4kV, SHORT PROTECTION, STAND-BY CURRENT, FUNCTION COMPATIBLE, EPINE
<b>BD67776FV-LB</b>	PARAMETER: I <sub>max</sub> 0.4A, 1/2STEP	FUNCTIONS: FWRW, DECA SW, THIN PKG, SMALL SIZE PACKAGE, ONE POWER, T.S.D., O.C.P., UV, OVLO, 4kV, SHORT PROTECTION, STAND-BY CURRENT, FUNCTION COMPATIBLE, EPINE, -40~+85°C

Part No.	Supply Voltage(V)		Output Current (A)	Circuit Current (mA)	Input Threshold Voltage		Output ON Resistance (Ω)	Package
	V <sub>cc</sub>	V <sub>m</sub>			High Level Voltage(V)	Low Level Voltage(V)		
BD6382EFV	3.0 to 5.5	5.5 to 13.5	0.8	1.6	2.0	0.8	1.2	HTSSOP-B24
BD6381EFV	2.5 to 5.5	6.0 to 13.5	1.2	1.6	2.0	0.8	1.0	HTSSOP-B24
BD6380EFV	2.5 to 5.5	4.0 to 13.5	0.8	1.6	2.0	0.8	1.2	HTSSOP-B24
BD67776FV-LB	—	1.4 to 4.0	0.5	0	0.8	—	0.68	SSOP-B16

## 45V Stepper Motor Drivers

<b>BD6425EFV</b>	CLK IN: I <sub>max</sub> 1.5A, 1/2STEP	FUNCTIONS: FWRW, DECA SW, THIN PKG, SMALL SIZE PACKAGE, ONE POWER, T.S.D., O.C.P., UV, OVLO, 8kV, SHORT PROTECTION, FUNCTION COMPATIBLE, EPINE
<b>BD6423EFV</b>	CLK IN: I <sub>max</sub> 1.0A, 1/2STEP	FUNCTIONS: FWRW, DECA SW, THIN PKG, SMALL SIZE PACKAGE, ONE POWER, T.S.D., O.C.P., UV, OVLO, 8kV, SHORT PROTECTION, FUNCTION COMPATIBLE, EPINE
<b>BD6422EFV</b>	PARAMETER: I <sub>max</sub> 1.0A, 1/2STEP	FUNCTIONS: FWRW, DECA SW, THIN PKG, SMALL SIZE PACKAGE, ONE POWER, T.S.D., O.C.P., UV, OVLO, 8kV, SHORT PROTECTION, FUNCTION COMPATIBLE, EPINE

Part No.	Supply Voltage(V)		Output Current (A)	Circuit Current (mA)	Input Threshold Voltage		Output ON Resistance (Ω)	Package
	V <sub>cc</sub>	V <sub>m</sub>			High Level Voltage(V)	Low Level Voltage(V)		
BD6425EFV	19 to 42		1.5	2.0	2.0	0.8	1.1	HTSSOP-B28
BD6423EFV	19 to 42		1.0	2.0	2.0	0.8	2.0	HTSSOP-B24
BD6422EFV	19 to 42		1.0	2.0	2.0	0.8	2.0	HTSSOP-B24

**Symbol Key**

- CLK IN**: Control signal input CLK-IN type
- PARAMETER**: Control signal input PARALLEL-IN type
- I<sub>max</sub> 0.4A, 0.8A, 1.0A, 1.2A, 1.3A, 1.5A, 2.0A, 2.5A**: Maximum output current
- 1/2STEP, 1/4STEP, 1/8STEP, 1/16STEP**: Number of step
- 60V MIN**: Voltage resistance
- SILENT**: Pseudo liner silent drive
- SILENT**: PWM silent drive
- SERVO**: Built-in servo circuit
- 120° PWM, 120° PWM, 180° PWM**: Output power system
- High power package**: High power package
- Constant-current PWM**: Constant-current PWM
- Thin package**: Thin package
- FWRW**: Switch able between forward and reverse
- SMALL SIZE PACKAGE**: Small power package
- DECA SW**: SLOW/FAST/MIX DECA switching function
- ONE POWER**: 1 power supply system due to built-in regulator
- T.S.D.**: Built-in thermal shut-down circuit
- O.C.P.**: Built-in over current protection circuit
- FUNCTION COMPATIBLE**: Function-compatible
- UV LO**: Built-in under voltage lock out circuit

## 3-Phase Brushless Motor Drivers

### 3-Phase Brushless Motor Pre-Drivers with Speed Control

#### BD6762FV



#### BD62491MUV



Part No.	Max. Voltage (V)	Supply Voltage (V)	Operating Temperature (°C)	Circuit Current (mA)	Input Threshold Voltage		External FET Drive Voltage		PWM Frequency (kHz)	Package
					H Level(V)	L Level(V)	Upper(V)	Lower(V)		
BD6762FV	36	16.0 to 28.0	-25 to +75	17.0	2.2	0.8	V <sub>CC</sub> +6.8	10.8	16	SSOP-B40
BD62491MUV	7	4.5 to 5.5	-40 to +85	6.5	2.0	0.8	V <sub>CC</sub> -0.2	V <sub>CC</sub> -0.2	20	VQFN032V5050

### 3-Phase Brushless Motor Driver with Speed Control

#### BD67929EFV



Part No.	Max. Voltage (V)	Supply Voltage (V)	Operating Temperature (°C)	Circuit Current (mA)	Input Threshold Voltage		External FET Drive Voltage		PWM Frequency (kHz)	Package
					H Level(V)	L Level(V)	Upper(V)	Lower(V)		
BD67929EFV	36	19 to 28	-25 to +85	4.0	3.0	1.5	-	-	200	HTSSOP-B28

### 3-Phase Brushless Motor Pre-Drivers

#### BD6761FS



#### BD63000MUV



#### BD63005MUV



Part No.	Max. Voltage (V)	Supply Voltage (V)	Operating Temperature (°C)	Circuit Current (mA)	Input Threshold Voltage		External FET Drive Voltage		PWM Frequency (kHz)	Package
					H Level(V)	L Level(V)	Upper(V)	Lower(V)		
BD6761FS	36	16.0 to 28.0	-35 to +75	15.0	2.2	0.8	V <sub>CC</sub> +6	10.5	15	SSOP-A32
BD63000MUV	30	8.0 to 26.4	-40 to +85	2.5	2.0	0.8	V <sub>G</sub> -0.2	4.8	External input	VQFN028V5050
<b>New</b> BD63005MUV	33	10.0 to 28.0	-25 to +85	3.9	2.0	0.8	-	-	External input	VQFN040V6060

### 3-Phase Brushless Motor Pre-Driver (for Automotive)

#### BD16805FV-M



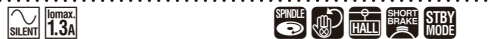
Part No.	Max. Voltage (V)	Supply Voltage (V)	Operating Temperature (°C)	Circuit Current (mA)	Input Threshold Voltage		External FET Drive Voltage		PWM Frequency (kHz)	Package
					H Level(V)	L Level(V)	Upper(V)	Lower(V)		
BD16805FV-M	60	8 to 18	-40 to +110	15.2	3.0	1.0	2×V <sub>CC</sub> -0.5	11.5	25	SSOP-B40

### 3-Phase Brushless Motor Drivers

#### BA6664FM



#### BA6859AFP-Y



#### BD6671FM



Part No.	Power Supply Voltage(V)		Max. Output Current(mA)	Current Drive Type	Reverse Protection	Servo Input	Rotating direction	FG Output	Hall Bias	Standby Circuit	Gain switching	Temp. Protection	Short Brake	Brake Mode Switching	Package
	Control	Output													
BA6664FM	4.5 to 5.5	3.0 to 14.0	1300	Pseudo linear	✓	R/F	✓	✓	✓	✓	✓	✓	✓	✓	HSOP-M28
BA6859AFP-Y	4.5 to 5.5	3.0 to 14.0	1300	Pseudo linear	✓	R/F	✓	✓	✓	✓	-	✓	✓	✓	HSOP25
BD6671FM	4.5 to 5.5	4.0 to 13.2	2500	PWM drive	✓	R/F	-	✓	✓	✓	✓	✓	✓	✓	HSOP-M28

Built-in over voltage lock out circuit	Easy replacement pin compatible with competitor's	ESD resistance	Standby current 0µA	Adjacent pin short protection	-40°C to +85°C operating temperature range	Inverse mounting protection
External output FET H-side:Nch/L-side:Nch	External output FET H-side:Pch/L-side:Nch	DMOS output	Spindle drive	Built-in FG Amp	Built-in reverse protection function	Built-in hysteresis Amp
High RPM-compatible	Built-in short brake	No-CLOCK input detection function	Standby mode	Built-in I/O gain switch function	Built-in motor lock-up protection circuit	Built-in over voltage protection circuit
						Built-in under voltage protection circuit

# Fan Motor Drivers

## 5V Single-Phase Full-wave Fan Motor Drivers

<b>BH6766FVM</b>						
<b>BH6789FVM</b>						
<b>BH6799FVM</b>						
<b>BU6906AGF</b>						
<b>BD6965NUX</b>						
<b>BD6966NUX</b>						
<b>BD6980NUX</b>						

Part No.	Supply Voltage (V)	Iomax. (mA)	Power Tr.	Output Saturation Voltage (V)	Speed Control	Hall Bias Voltage (V)	Lock Time Ratio	Package
BH6766FVM	2.0 to 6.0	630	CMOS	Upper and Lower 0.6(Io=250mA)	—	1.3	—	MSOP8
BH6789FVM	2.0 to 6.0	1000	CMOS	Upper and Lower 0.32 (Io=250mA)	—	1.3	1:10	MSOP8
BH6799FVM	2.0 to 6.0	1000	CMOS	Upper and Lower 0.32 (Io=250mA)	—	1.3	1:10	MSOP8
BU6906AGF	1.8 to 5.5	800	CMOS	Upper and Lower 0.16 (Io=200mA)	Direct PWM	Include Hall sensor	1:10	SSOF6
BD6965NUX	2.0 to 5.5	800	CMOS	Upper and Lower 0.4(Io=250mA)	Direct PWM	—	1:10	VSON008X2030
BD6966NUX	1.8 to 5.5	1000	CMOS	Upper and Lower 0.4(Io=300mA)	Direct PWM	1.0	1:10	VSON010X3030
BD6980NUX	1.8 to 5.5	1000	CMOS	Upper and Lower 0.4(Io=300mA)	Direct PWM	1.0	1:10	VSON010X3030

## Standard Single-Phase Full-wave Fan Motor Drivers

<b>BD6981FVM</b>						
<b>BD6982FVM</b>						
<b>BD6967FVM</b>						
<b>BD6968FVM</b>						
<b>BD6962FVM</b>						
<b>BD6964FVM</b>						
<b>BD6961F</b>						
<b>BD6964F</b>						
<b>BA6423AF</b>						
<b>BA6424AFS</b>						

Part No.	Supply Voltage (V)	Iomax. (mA)	Power Tr.	Output Saturation Voltage (V)	Speed Control	Hall Bias Voltage (V)	Lock Time Ratio	Package
BD6981FVM	2.8 to 16.0	800	DMOS	Upper and Lower 0.45(Io=200mA)	—	1.2	1:6	MSOP8
BD6982FVM	2.8 to 16.0	800	DMOS	Upper and Lower 0.45(Io=200mA)	—	1.2	1:6	MSOP8
BD6967FVM	3.3 to 14.0	800	DMOS	Upper and Lower 0.45(Io=200mA)	DC/Direct PWM	1.2	1:10	MSOP10
BD6968FVM	3.3 to 14.0	800	DMOS	Upper and Lower 0.45(Io=200mA)	DC/Direct PWM	1.2	1:10	MSOP10
BD6962FVM	3.3 to 14.0	800	DMOS	Upper and Lower 0.4(Io=300mA)	Direct PWM	—	1:10	MSOP8
BD6964FVM	3.3 to 14.0	800	DMOS	Upper and Lower 0.4(Io=300mA)	Direct PWM	—	1:10	MSOP8
BD6961F	3.3 to 14.0	1000	DMOS	Upper and Lower 0.4(Io=300mA)	Direct PWM	—	1:10	SOP8
BD6964F	3.3 to 14.0	1000	DMOS	Upper and Lower 0.4(Io=300mA)	Direct PWM	—	1:10	SOP8
BA6423AF	6.0 to 28.0	1000	Bipolar	Upper 0.9/Lower 0.8 (Io=200mA)	—	—	1:4.7	SOP8
BA6424AFS	6.0 to 28.0	1000	Bipolar	Upper 0.9/Lower 0.8 (Io=200mA)	—	—	1:4.7	SSOP-A16

<b>Symbol Key</b>	5V Power supply compatible	12V Power supply compatible	24V Power supply compatible	100mA	250mA	300mA	350mA	400mA	450mA	800mA		This is an indication for the amount of current that can flow into a motor running at fixed speed.			
	Include Hall Sensor		Small mount type		RPM pulse signal output		Soft switching		Built-in hall element power supply voltage		Rotational speed control possible		External capacitor for detecting motor lock not necessary		Lock alarm signal output

**Multifunction Single-Phase Full-wave Fan Motor Drivers**

<b>BD6971FS</b>			
<b>BD6971FV</b>			
<b>BD6721FS</b>			
<b>BD6975FV</b>			
<b>BD6722FS</b>			
<b>BD6973FV</b>			
<b>BD6974FV</b>			
<b>BD6726FU</b>			

Part No.	Supply Voltage (V)	I <sub>omax.</sub> (mA)	Power Tr.	Output Saturation Voltage (V)	Speed Control	Hall Bias Voltage (V)	Lock Time Ratio	Package
<b>BD6971FS</b>	3.5 to 17.0	1000	DMOS	Upper and Lower 0.6 (I <sub>o</sub> =200mA)	DC/Direct PWM	1.3	1:10	SSOP-A16
<b>BD6971FV</b>	3.5 to 17.0	1000	DMOS	Upper and Lower 0.6 (I <sub>o</sub> =200mA)	DC/Direct PWM	1.3	1:10	SSOP-B14
<b>BD6721FS</b>	4.5 to 17.0	1000	DMOS	Upper and Lower 0.6 (I <sub>o</sub> =300mA)	DC/Direct PWM	—	1:10	SSOP-A16
<b>BD6975FV</b>	3.5 to 17.0	1200	DMOS	Upper and Lower 0.4 (I <sub>o</sub> =400mA)	DC/Direct PWM	1.25	1:10	SSOP-B14
<b>BD6722FS</b>	4.5 to 17.0	1500	Half pre-driver (Lower Tr. incorporated)	Lower 0.3 (I <sub>o</sub> =600mA)	DC/Direct PWM	—	1:20	SSOP-A16
<b>BD6973FV</b>	4.3 to 17.0	10	Pre-driver	—	DC/Direct PWM	1.26	1:20	SSOP-B16
<b>BD6974FV</b>	4.3 to 17.0	10	Pre-driver	—	DC/Direct PWM	1.26	1:20	SSOP-B16
<b>BD6726FU</b>	5.0 to 17.0	10	Pre-driver	—	Feedback	1.5	1:20	SSOP-C20

**2-Phase Half-wave Fan Motor Drivers**

<b>BD6701F</b>			
<b>BA6406F</b>			
<b>BA6506F</b>			
<b>BA6901F</b>			

Part No.	Supply Voltage (V)	I <sub>omax.</sub> (mA)	Power Tr.	Output Saturation Voltage (V)	Speed Control	Hall Bias Voltage (V)	Zener Diode Clamp Voltage (V)	Output Clamp Voltage (V)	Lock Time Ratio	Package
<b>BD6701F</b>	6.0 to 28.0	800	DMOS	0.3 (I <sub>o</sub> =200mA)	—	—	—	54	1:10	SOP8
<b>BA6406F</b>	4.0 to 28.0	70	Pre-driver	—	—	—	—	—	1:4.5	SOP8
<b>BA6506F</b>	4.0 to 28.0	70	Pre-driver	—	—	—	—	—	1:4.5	SOP8
<b>BA6901F</b>	3.5 to 28.0	70	Pre-driver	—	PWM	—	—	—	1:10	SOP16

**3-Phase Full-wave Fan Motor Drivers**

<b>BH67172NUX</b>		
<b>BD6346FV</b>		
<b>BD63441AFU</b>		

Part No.	Supply Voltage (V)	I <sub>omax.</sub> (mA)	Power Tr.	Output Saturation Voltage (V)	Speed Control	Hall Bias Voltage (V)	Lock Time Ratio	Package
<b>BH67172NUX</b>	1.8 to 5.5	700	CMOS	Upper and Lower 0.25(I <sub>o</sub> =250mA)	Direct PWM	—	1 : 10	VSON010X3030
<b>BD6346FV</b>	5.5 to 17.0	1200	DMOS	Upper and Lower 0.24(I <sub>o</sub> =200mA)	DC/Direct PWM	—	1 : 10	SSOP-B20
<b>BD63441AFU</b>	5.5 to 16.0	10	Pre-Drive	—	DC/Direct PWM	—	1 : 10	SSOP-C20

Motor lock detection function   
 Motor startup possible low-duty   
 Built-in thermal shut-down circuit   
 Drive method with hall sensor for detecting the rotor position   
 Soft start   
 Output power system   
 Minimum rotational speed setting   
 Output current limit can be set

Built-in diode for preventing damage due to backward connection   
 Detect the speed of motor rotation, control it to follow the setting.

Motor / Actuator Drivers

## 3-Phase Brushless Fan Motor Drivers For Household Appliances (White goods)

### BM6202FS



### BM6203FS



Part No.	Control	Output Device	Voltage Ratings (V)	Output Current (A)	Output On Resistance (Ω)	Diode Forward Voltage (V)	Package
BM6202FS	6 inputs	PrestoMOS™	600	1.5	2.7	1.1	SSOP-A54_23
BM6203FS	6 inputs	PrestoMOS™	600	2.5	1.7	1.1	SSOP-A54_23

## 3-Phase Brushless Fan Motor Controllers For Household Appliances (White goods)

### BD62011FS



### BD62012FS



### BD62013FS



### BD62014FS



Part No.	Supply Voltage (V)	Commutation Logic	Control Voltage Range (V)	Phase Control Range (deg)	FG Pulse Number	Hall Bias Switch	Package
BD62011FS	10.0 to 18.0	180°	2.1 to 5.4	0 to +40	4 / 12	—	SSOP-A24
BD62012FS	10.0 to 18.0	150°	2.1 to 5.4	0 to +30	4 / 12	—	SSOP-A24
BD62013FS	10.0 to 18.0	150°	2.1 to 5.4	0 to +30	12	✓	SSOP-A24
BD62014FS	10.0 to 18.0	180°	1.1 to 4.4	0 to +40	4 / 12	—	SSOP-A24

## Driver for ODD

### 1ch System Motor Driver ICs Wide application

Part No.	Power Supply (V)		Max. Output Current (mA)	Current Drive Type	Reverse Protection	Servo Input	Rotating Direction	FG Output	Hall Bias	Standby Circuit	Gain Switching	Temp. Protection	Short Brake	Brake Mode Switching	Package
	Control	Output													
BA6664FM	4.5 to 5.5	3.0 to 14.0	1300	Pseudo linear	✓	R/F	✓	✓	✓	✓	✓	✓	✓	✓	HSOP-M28
BA6859AFP-Y	4.5 to 5.5	3.0 to 14.0	1300	Pseudo linear	✓	R/F	✓	✓	✓	✓	—	✓	✓	✓	HSOP25
BD6671FM	4.5 to 5.5	4.0 to 13.2	2500	PWM drive	✓	R/F	—	✓	✓	✓	✓	✓	✓	✓	HSOP-M28

Part No.	Power Supply (V)	Dynamic Range of Driver Output (V)	I/F AMP.	Mute of Driver Output	Regulator for DSP (V)	Protect Circuit for Low Power Supply	Protect for Abnormal Input	Temp. Protection	Standby Circuit	Package
BA5961FV	4.3 to 13.5	4.2(V <sub>CC</sub> =5V, R <sub>L</sub> =8 Ω)	3 circuits	—	—	—	✓	✓	✓	SSOP-B20W
BA5962FVM	3.0 to 10.0	4.1(V <sub>CC</sub> =5V, R <sub>L</sub> =50 Ω)	—	—	—	✓	✓	✓	✓	MSOP8
BD7931F	4.5 to 14.0	7.5(V <sub>CC</sub> =8V, R <sub>L</sub> =500mA)	—	—	—	—	—	✓	✓	SOP8
BH6578FVM	4.5 to 5.5	4.5(V <sub>CC</sub> =5V, R <sub>L</sub> =500mA)	—	—	—	—	—	✓	—	MSOP8

### 2ch to 3ch System Motor Driver IC Actuator applicable

Part No.	Power Supply (V)	I/F	FOCUS TILT	TRACKING	SLED	LOADING	SPINDLE	Short Circuit Protection Loading	Protect for Pickup	Package
BD8271EFV	4.5 to 14.0	Analog & PWM	1ch	—	2ch STTEPING	—	—	—	—	HTSSOP-B24

### 4ch System Motor Driver ICs Basic type for CD player

Part No.	Power Supply (V)	I/F	FOCUS TILT	TRACKING	SLED	LOADING	SPINDLE	Short Circuit Protection for Loading	Protect for Pickup	Regulator	Reset	Package
BD8201FM	4.5 to 14.0	Analog & PWM	1ch	1ch	DC Select input	DC	DC	✓	—	—	—	HSOP-M28
BD8223EFV	5.5 to 14.0	Analog & PWM	1ch	1ch	DC Select input	DC	DC	✓	Self off	—	—	HTSSOP-B28
BD8224EFV	4.5 to 14.0	Analog & PWM	1ch	1ch	DC Select input	DC	DC	—	—	—	2 input 1 output	HTSSOP-B24
BD8226EFV	5.5 to 14.0	Analog & PWM	1ch	1ch	DC Select input	DC	DC	—	—	Variable voltage × 1	—	HTSSOP-B24
BD8229EFV	4.5 to 14.0	Analog & PWM	1ch	1ch	DC Select input	DC	DC	—	—	—	1 input 1 output	HTSSOP-B24
BD8231EFV	6.0 to 10.0	Analog & PWM	1ch	1ch	DC Select input	3-Phase Brushless	DC	—	—	—	—	HTSSOP-B40
<b>New</b> BD8266EFV	4.5 to 10.0	Analog & PWM	1ch	1ch	DC Select input	DC	DC	—	Self off	—	—	HTSSOP-B24

### 5ch System Motor Driver ICs Loading channel added

Part No.	Power Supply (V)	I/F	FOCUS TILT	TRACKING	SLED	LOADING	SPINDLE	Short Circuit Protection for Loading	Protect for Pickup	Regulator	Package
BA5814FM	4.3 to 13.2	Analog & PWM	1ch	1ch	DC	DC	DC	—	—	Variable voltage × 2	HSOP-M28
BD8203EFV	4.5 to 14.0	Analog & PWM	1ch	1ch	DC	DC	DC	—	—	Variable voltage × 1 5V Fixed × 1	HTSSOP-B40

### 6ch to 9ch System Motor Driver ICs Basic type for DVD player, Blu-ray

Part No.	Power Supply (V)	I/F	FOCUS TILT	TRACKING	SLED	LOADING	SPINDLE	LVDS for SA	Short Circuit Protection for Loading	Protect for Pickup	Package
BD8210EFV	6.0 to 10.0	Analog & PWM	1ch	1ch	2ch STTEPING	DC	3-Phase Brushless	—	✓	Self off	HTSSOP-B54
BD8215EFV	6.0 to 10.0	Analog & PWM	1ch	1ch	2ch STTEPING	DC	3-Phase Brushless	—	✓	Flag only	HTSSOP-B54
BD8217EFV	6.0 to 10.0	Analog & PWM	1ch	1ch	2ch STTEPING	DC	3-Phase Brushless	—	✓	Flag only	HTSSOP-B54
<b>New</b> BD8255MUV	4.5 to 5.5	SPI	1ch	1ch	2ch STTEPING	DC	3-Phase Brushless	—	✓	—	VQFN48SV7070
<b>New</b> BD8256EFV	4.5 to 10.5	SPI	2ch	1ch	2ch STTEPING	DC	3-Phase Brushless	2ch	✓	Self off	HTSSOP-B54

<b>Symbol Key</b>	Voltage resistance	Output power system	Output power system	Maximum output current	Maximum output current	Built-in thermal shut-down circuit	Built-in under voltage lock out circuit	Built-in over current protection circuit	Output current limit can be set
	External capacitor for detecting motor lock not necessary	RPM pulse signal output	Built-in hall element power supply voltage						



System Motor Driver ICs for Half Height Drives (3 sensors) Basic type										
Part No.	Supply Voltage (V)	CH	Output System	Output	Output Gain	Under Voltage Protection	Overvoltage Protection	Input Abnormality Protection	Temperature Protection	Package
BD7959EFV	4.3 to 5.5	ch1 to 3	BTL	4.1V	17.5dB	✓	-	✓	✓	HTSSOP-B54
		ch4	BTL	9.8V	17.5dB					
	10.8 to 13.2	ch5 · 6	PWM	2.2Ω	1.25A/V					
		ch7	PWM	1.5Ω	1.15A/V					
		ch8 · 9	PWM	2.2Ω	0.17A/V					
System Motor Driver ICs for Half Height Drives (Sensorless) Space saving type										
BD7755RFV	4.3 to 5.5	ch1 to 3	BTL	4.1V	21.6dB or 15.6dB	✓	-	✓	✓	HTSSOP-B54R
		ch4 · 5	PWM	1.3Ω	0.2A/V					
	10.8 to 13.2	ch6 · 7	PWM	2.2Ω	1.0A/V					
		ch8	PWM	1.0Ω	3.5A/V					
		ch9	BTL	4.3V/9.9V	17.5dB					
System Motor Driver ICs for Slim Drives (3 sensors) Basic type										
BH5510KV/ BH5510KVT	4.0 to 5.5	ch1 to 3	PWM	1.3Ω	14dB	✓	✓	✓	✓	VQFP48C/ TQFP48V
		ch4 · 5	PWM	1.5Ω	14dB					
		ch6	PWM	0.6Ω	1A/V or 0.2A/V					
BH5511KV	4.0 to 5.5	ch1 to 3	PWM	1.3Ω	17.5dB/8.0dB	✓	✓	✓	✓	VQFP48C
		ch4 · 5	PWM	1.5Ω	17.5dB					
		ch6	PWM	0.6Ω	0.5A/V or 0.33A/V or 0.17A/V					

## Driver for Printer

3-Phase Brushless Motor Driver for Polygonal Mirrors For LBP, PPC										
Part No.	Supply Voltage (V)	Output Current (A)	Circuit Current (mA)	Input Threshold Voltage		Current Limit Detect Voltage (V)	ON Resistance (Ω)	Circuit Current When Motor Stop (mA)	Pwm Frequency (kHz)	Package
				H Level(V)	L Level(V)					
BD67929EFV	19 to 28	2.5	4.0	3.0	1.5	0.5	1.35 (Io=1.0A)	1.0	200	HTSSOP-B28
Motor Drivers with Brush for Printers										
Part No.	Supply Voltage (V)	Output Current (A)	Output Current Peak(A)	Circuit Current (mA)	Input Threshold Voltage		Output ON Resistance (Ω)	Package		
					H Level(V)	L Level(V)				
BD63821EFV	19 to 28	1.0	1.5	2.5	2.0	0.8	1.9(Io=0.5A)	HTSSOP-B28		
BD63823EFV	19 to 28	2.0	2.8	2.5	2.0	0.8	0.65(Io=1.5A)	HTSSOP-B28		
<b>New</b> BD62210EFV	8 to 28	1.0	1.5	2.5	2.0	0.8	1.9	HTSSOP-B28		
<b>New</b> BD62220EFV	8 to 28	2.0	2.8	2.5	2.0	0.8	0.65	HTSSOP-B28		
Bipolar Stepper Motor Drivers for Paper Feed / Carriage For LBP, PPC, Scanner, Photo, Printer, FAX, IJP Please refer to page A69, A70 General Purpose ICs for the other new Stepper Motor Driver lineup.										
Part No.	Supply Voltage(V)	Output Current (A)	Circuit Current (mA)	Input Threshold Voltage		Output ON Resistance (Ω)	Package			
	Vcc			High Level Voltage(V)	Low Level Voltage(V)					
BD63801EFV	19 to 28	0.8	2.7	2.0	0.8	2.8	HTSSOP-B24			
BD63874EFV	19 to 28	1.5	2.0	2.0	0.8	1.0	HTSSOP-B28			
<b>New</b> BD63715AEFV	19 to 28	1.5	2.0	2.0	0.8	0.95	HTSSOP-B28			
3-Phase Brushless Motor Pre-Drivers for Paper Feed For LBP, PPC										
Part No.	Max. Voltage (V)	Supply Voltage (V)	Operating Temperature (°C)	Circuit Current (mA)	Input Threshold Voltage		External Threshold Voltage		PWM Frequency (kHz)	Package
					H Level(V)	L Level(V)	Upper(V)	Lower(V)		
BD6761FS	36	16 to 28	-35 to +75	15.0	2.2	0.8	Vcc+6	10.5	15	SSOP-A32
BD6762FV	36	16 to 28	-25 to +75	17.0	2.2	0.8	Vcc+6.8	10.8	16	SSOP-B40
BD62491MUV	7	4.5 to 5.5	-40 to +85	6.5	2.0	0.8	Vcc-0.2	Vcc-0.2	20	VQFN032V0500
System Drivers for Inkjet Printers										
Part No.	Supply Voltage (V)	H-bridge Output Current (A)	SW-REG Output Current (A)	H-bridge1 ON Resistance (Ω)	H-bridge2 ON Resistance (Ω)	SW-REG ON Resistance (Ω)	SW-REG Output Voltage (V)	SERIES REG Output Voltage (V)	Package	
										(Io=1.0A)
BD64550EFV	18 to 36	2.5	0.5	1.0 (Io=1.0A)	1.2 (Io=1.0A)	0.8 (Io=0.25A)	3.0 to 5.0	1.5	HTSSOP-B40	
BD64532EKV	9 to 45	2.0	2.5	1.8 (Io=1.0A)	1.8 (Io=1.0A)	0.55 (Io=1.0A)	1 to Vbb × 0.5 (Max. 13.5V)	-	HTQFP64V	
<b>New</b> BD64538EFV	9 to 45	1.5	1.5	1.75 (Io=1.0A)	1.75 (Io=1.0A)	0.75 (Io=1.0A)	3 to Vbb × 0.6 (Max. 5.5V)	1.0 to 2.5	HTSSOP-B28	

3-Phase Brushless Motor Driver for Polygonal Mirrors For LBP, PPC : Current limit value is calculated by dividing current limit voltage by RNF resistance which is to detect the output current.  
Motor Drivers with Brush for Printers: The BD63821EFV and BD63823EFV are all pin-compatible. The BD62210EFV and BD62220EFV are all pin-compatible.

# Driver for Digital Still Camera

## 5ch System Lens Drivers for Digital Cameras

Part No.	Supply Voltage (V)	Driver Output Max. Current (A)	Drive Method	Examples of Actuator (Driven Motor, Driving System, and Output ON Resistance(Ω))				Input Interface	Reference Voltage Output for Output Setting Current (V)	Package (mm)
				AF	Zoom	Iris	Shutter			
BD6370GUL	2.7 to 5.5	0.5	ex. 1	STM(ch1, 2) Constant voltage/ FULL ON 1.4	DCM(ch3) Constant voltage/ FULL ON 1.4	DCM or VCM(ch4) Constant voltage/ Constant current/FULL ON 1.4	VCM(ch5) Constant current 1.4	Parallel + Serial	Output current control using built-in D/A converter	VCSP50L2 (2.6 × 2.6) H=0.55Max.
				STM(ch1, 2) Constant voltage/ FULL ON 1.4	STM(ch1, 2, 3) Constant voltage/ FULL ON 1.4	DCM or VCM(ch4) Constant voltage/ Constant current/FULL ON 1.4	VCM(ch5) Constant current 1.4			
BD6758MWW	2.5 to 5.5	0.8	ex.	STM(ch1, 2) FULL ON 1.2	DCM(ch3) FULL ON 1.2	DCM or VCM(ch4) FULL ON 1.2	VCM(ch5) Constant current 1.0	Parallel	1.2 (±3%)	UQFN36V5050 (5.0 × 5.0) H=1.0Max.
BD6758KN	2.5 to 5.5	0.8	ex.	STM(ch1, 2) FULL ON 1.2	DCM(ch3) FULL ON 1.2	DCM or VCM(ch4) FULL ON 1.2	VCM(ch5) Constant current 1.0	Parallel	1.2 (±3%)	VQFN36 (6.2 × 6.2) H=0.95Max.

## 6ch System Lens Drivers for Digital Cameras and SLRs (Single Lens Reflex)

Part No.	Supply Voltage (V)	Driver Output Max. Current (A)	Drive Method	Examples of Actuator (Driven Motor, Driving System, and Output ON Resistance(Ω))				Input Interface	Reference Voltage Output for Output Setting Current (V)	Package (mm)
				AF	Zoom	Iris	Shutter			
BD6373GW	2.5 to 5.5	0.8	ex.	STM(ch1, 2) FULL ON 1.2	STM(ch3, 4) FULL ON 1.2	DCM or VCM(ch5) FULL ON 1.2	VCM(ch6) FULL ON 1.2	Parallel	—	UCSP75M2 (2.6 × 2.6) H=0.85Max.
BD6753KV	4.5 to 10.5 (ch1, 2) 2.0 to 10.5 (ch3 to 6)	0.8	ex.	STM(ch1, 2) FULL ON 1.2	STM(ch3, 4) FULL ON 1.2	DCM or VCM(ch5) PWM(±3%) 1.2	VCM(ch6) PWM(±3%) 1.2	Parallel + Serial	0.9 (±10%)	VQFN48C (8.2 × 9.0) H=1.60Max.

## 7ch System Lens Drivers for Digital Cameras and SLRs (Single Lens Reflex)

Part No.	Supply Voltage (V)	Driver Output Max. Current (A)	Drive Method	Examples of Actuator (Driven Motor, Driving System, and Output ON Resistance(Ω))					Input Interface	Reference Voltage Output for Output Setting Current (V)	Package (mm)
				AF	Zoom	Iris	Shutter	Anti Shock			
BD6889GU	2.5 to 5.5	0.8	ex. 1	STM(ch1, 2) FULL ON 1.3	STM(ch3, 4) FULL ON 1.3	STM(ch5, 6) FULL ON 1.3	VCM(ch7) Constant current(±3%) 0.9	—	Parallel	0.9 (±2%)	VBGA063T050 (5.0 × 5.0) H=1.20Max.
				STM(ch1, 2) FULL ON 1.3	DCM(ch3) FULL ON 1.3	DCM(ch4) FULL ON 1.3	VCM(ch7) Constant current(±3%) 0.9	STM(ch5, 6) FULL ON 1.3			

## 1ch to 2ch Lens Drivers for SLRs (Single Lens Reflex)

Part No.	Channel	Supply Voltage (V)	Driver Output Max. Current (A)	Drive Method	Examples of Actuator (Driven Motor, Driving System, and Output ON Resistance(Ω))					Turn on Time	Turn off Time	Control Frequency	Package (mm)
					Cleaner	AF	Zoom	Iris	Shutter				
BD65492MUV	2	1.8 to 16.0	1.0	ex.	—	STM(ch.2) Full-ON 0.9	—	—	—	200ns (Including 80ns to Prevent from overlap current.)	80ns	500kHz(Max.)	VQFN024V4040 (4.0 × 4.0)
BD6735FV	2	2.0 to 8.0	1.0	ex.	—	—	—	STM(ch.2) Full-On 1.0	—	300ns (Including 90ns to Prevent from overlap current.)	100ns	100kHz(Max.)	SSOP-B20 (6.5 × 6.4)
BD6376GUL	1	2.0 to 9.0	1.0	ex.	—	—	DCM(ch.1) Full-On 0.45	—	—	200ns (Including 80ns to Prevent from overlap current.)	60ns	200kHz(Max.)	VCSP50L1 (1.6 × 1.6) H=0.55Max.
BD65491FV	1	1.8 to 16.0	1.2 Peak 4.0	ex.	—	—	—	—	Plunger(ch.1) Full-On 0.35	150ns (Including 80ns to Prevent from overlap current.)	50ns	500kHz(Max.)	SSOP-B16 (6.5 × 5.0)
BD6736FV	1	2.0 to 9.0	1.0 Peak 3.2	ex.	—	—	—	—	Plunger(ch.1) Full-On 0.35	1000ns (Including 800ns to Prevent from overlap current.)	100ns	100kHz(Max.)	SSOP-B20 (6.5 × 6.4)
BD65499MUV	1	4.0 to 27.0	0.5 Peak 2.0	ex.	Piezo(ch.1) Full-On 0.6	—	—	—	—	150ns (Including 80ns to Prevent from overlap current.)	50ns	300kHz(Max.)	VQFN028V5050
BD65494MUV	1	2.0 to 9.0	1.0 Peak 2.5	ex.	—	—	—	—	Plunger(ch.1) Full-On 0.55	200ns (Including 80ns to Prevent from overlap current.)	60ns	200kHz(Max.)	VQFN016V3030
BD65496MUV	1	1.8 to 16.0	1.2 Peak 5.0	ex.	—	—	—	—	Plunger(ch.1) Full-On 0.35	150ns (Including 80ns to Prevent from overlap current.)	50ns	500kHz(Max.)	VQFN024V4040

STM : Stepping motor, DCM : DC motor, VCM : Voice coil motor ("Drive method examples of actuator" are recommendation. Another types may be evaluated.)

Microstep system Lens Drivers for Digital Cameras												
Part No.	Supply Voltage (V)	Driver Output Max. Current (A)	Drive Method Examples of Actuator (Driven Motor, Driving System, and Output ON Resistance(Ω))					Input Interface	Microstep Resolution	Package (mm)		
			AF	Zoom	Iris	Shutter	Others					
BU24020GU	2.7 to 3.6 (Logic) 2.7 to 5.5 (Driver)	0.5	ex. 1	STM(ch1, 2) μ-step (class-D) 1.5	STM(ch3, 4) μ-step (class-D) 1.5	—	—	—	3-wire serial	1024	VCSP85H2 (2.6×2.6) H=1.0Max.	
			ex. 2	STM(ch1, 2) μ-step (class-D) 1.5	DCM(ch3) Full ON(PWM) 1.5	VCM(ch4) Full ON(PWM) 1.5	—	—				
BU24031GW	1.62 to 3.6 (Lo) 2.7 to 3.6 (Logic) 2.7 to 5.5 (Driver)	0.5	ex	STM(ch1, 2) μ-step (class-D) 2.0	DCM(ch4) Full ON(PWM+Speed Control) 2.0	VCM(ch3) Full ON(PWM) 2.0	VCM(ch5) constant current 1.0	—	3-wire serial	1024	UCSP75M2 (2.5×2.5) H=0.85Max.	
BU24032GW	2.7 to 3.6 (Logic) 2.7 to 5.5 (Driver)	0.5	ex	STM(ch1, 2) μ-step (class-D) 2.0	DCM(ch5) Full ON(PWM+Speed Control) 2.0	VCM(ch3) Full ON(PWM) 2.0	VCM(ch6) constant current 1.0	DCM or VCM(ch4) FULL ON(PWM) 2.0	3-wire serial	1024	UCSP75M2 (2.5×2.5) H=0.85Max.	
BU24033GW	1.62 to 3.6 (Lo) 2.7 to 3.6 (Logic) 2.7 to 5.5 (Driver)	0.5/0.6	ex. 1	STM(ch1, 2) μ-step (class-D) 1.5	STM(ch3, 4) μ-step (class-D) 1.5	VCM(ch5) Full ON(PWM) 1.0	VCM(ch6) constant current 1.0	—	3-wire serial	1024	UCSP75M3 (3.0×3.0) H=0.85Max.	
			ex. 2	STM(ch1, 2) μ-step (class-D) 1.5	DCM(ch5) Full ON(PWM+Speed Control) 1.0	VCM(ch3) Full ON(PWM) 1.5	VCM(ch6) constant current 1.0	DCM(ch4) Full ON(PWM) 1.5				
BU24035GW	2.7 to 3.6 (Logic) 2.7 to 5.5 (Driver)	0.5/0.6	ex. 1	STM(ch1, 2) μ-step (class-D) 1.5	DCM(ch5) Full ON(PWM+Speed Control) 1.0	STM(ch3, 4) Full ON(PWM)/constant current 1.5	VCM(ch6) constant current 1.0	—	3-wire serial	1024	UCSP75M3 (3.1×3.1) H=0.85Max.	
			ex. 2	STM(ch1, 2) μ-step (class-D) 1.5	DCM(ch3) Full ON(PWM+Speed Control) 1.5	VCM(ch5) Full ON(PWM)/constant current 1.0	VCM(ch6) constant current 1.0	VCM(ch4) Full ON(PWM) 1.5				
BU24024GU	2.7 to 3.6 (Logic) 2.7 to 5.5 (Driver)	0.4/0.6	ex. 1	STM(ch1, 2) μ-step (class-D) 1.5	STM(ch3, 4) μ-step (class-D) 1.5	VCM(ch6) constant current 1.0	VCM(ch7) constant current 1.0	DCM or VCM(ch5) FULL ON(PWM) 1.0	3-wire serial	1024	VCSP85H3 (3.5×3.5) H=1.0Max.	
			ex. 2	STM(ch1, 2) μ-step (class-D) 1.5	DCM(ch5) FULL ON(PWM) 1.0	STM(ch3, 4) μ-step (class-D) 1.5	VCM(ch7) constant current 1.0	DCM or VCM(ch6) constant current 1.0				
BU24025MWV	2.7 to 3.6 (Logic) 2.7 to 5.5 (Driver)	0.5	ex. 1	STM(ch1, 2) μ-step (class-D) 1.5	STM(ch3, 4) μ-step (class-D) 1.5	VCM(ch6) constant current 1.0	VCM(ch7) constant current 1.0	DCM or VCM(ch5) FULL ON(PWM) 1.0	3-wire serial	1024	UQFN044V6060 (6.0×6.0) H=1.0Max.	
			ex. 2	STM(ch1, 2) μ-step (class-D) 1.5	DCM(ch5) FULL ON(PWM) 1.0	STM(ch3, 4) μ-step (class-D) 1.5	VCM(ch7) constant current 1.0	DCM or VCM(ch6) constant current 1.0				
BU24026GU	2.7 to 3.6 (Logic) 2.7 to 5.5 (Driver)	0.5	ex	STM(ch1, 2) μ-step (class-D) 1.5	STM(ch3, 4) μ-step (class-D) 1.5	STM(ch5, 6) μ-step (class-D) 1.5	VCM(ch7) constant current 1.0	—	3-wire serial	1024	VCSP85H3 (3.8×3.8) H=1.0Max.	
BU24038GW	2.7 to 3.6 (Logic) 2.7 to 5.5 (Driver)	0.5	ex. 1	STM(ch1, 2) μ-step (class-D) 1.5	STM(ch3, 4) μ-step (class-D) 1.5	STM(ch5, 6) μ-step (class-D) 1.5	VCM(ch8) Full ON(PWM) 1.5	VCM(ch9) constant current 1.0	DCM(ch7) Full ON(PWM) 1.5	3-wire serial	1024	UCSP75M3 (3.8×3.8) H=0.85Max.
			ex. 2	STM(ch1, 2) μ-step (class-D) 1.5	STM(ch5, 6) μ-step (class-D) 1.5	VCM(ch3) Full ON(PWM) 1.5	VCM(ch4) Full ON(PWM) 1.5	VCM(ch9) constant current 1.0	DCM(ch7) Full ON(PWM) 1.5			

STM : Stepping motor, DCM : DC motor, VCM : Voice coil motor ("Drive method examples of actuator" are recommendation. Another types may be evaluated.)

A

Motor / Actuator Drivers

# Mobile Phone Module Driver

## Parallel Interface Lens Driver for Voice Coil Motors

Part No.	Supply Voltage (V)	Applications	ch	Drive System	Driver Output Max. Current (A)	Driver Output ON Resistance (Ω)	Input Interface	Input Mode Selection Terminal	Current Sense Resistor	UVLO	Temperature Protection	Power Save Function	Package (mm)
BD6369GUL	2.5 to 5.5	<b>AF</b> Drive AF using voice coil motor.	1	Constant voltage (±5%)	0.5	0.8 (V <sub>IN</sub> =5V, I <sub>O</sub> =0.4A)	Parallel	✓	—	✓	✓	✓	VCSP50L2 (2.1 × 2.1) H=0.55Max.

## 2-wire Serial (I<sup>2</sup>C-compatible) Interface Lens Drivers for Voice Coil Motors

Part No.	Supply Voltage (V)	Applications	ch	Drive System	Driver Output Max. Current (A)	Driver Output Low Voltage (V)	Input Interface	Ring Compensation	UVLO	Temperature Protection	Power Save Function	Package (mm)
BU64241GWZ	2.3 to 4.8	<b>AF</b> Drive AF using voice coil motor.	0.25	Constant current (±10%)	0.130	0.15 (V <sub>CC</sub> =3V, I <sub>O</sub> =0.1A)	I <sup>2</sup> C compatible	ISRC	✓	✓	✓	UCSP30L1 (1.3 × 0.77) H=0.33Max.
BU64243GWZ	2.3 to 4.8	<b>AF</b> Drive AF using voice coil motor.	0.25	Constant current (±10%)	0.130	0.15 (V <sub>CC</sub> =3V, I <sub>O</sub> =0.1A)	I <sup>2</sup> C compatible	ISRC	✓	✓	✓	UCSP35L1 (0.77 × 1.3) H=0.40Max.
<b>New</b> BU64244GWZ	2.3 to 4.8	<b>AF</b> Drive AF using voice coil motor.	0.25	Constant current (±10%)	0.130	0.15 (V <sub>CC</sub> =3V, I <sub>O</sub> =0.1A)	I <sup>2</sup> C compatible	ISRC	✓	✓	✓	UCSP35L1 (0.77 × 1.3) H=0.36Max.
BU64291GWZ	2.3 to 4.8	<b>AF</b> Drive AF using voice coil motor.	0.5	Constant current (±5%)	0.100	0.25 (V <sub>CC</sub> =3V, I <sub>O</sub> =0.1A)	I <sup>2</sup> C compatible	ISRC	✓	✓	✓	UCSP30L1 (0.77 × 1.37) H=0.33Max.

## Parallel Interface Lens Driver for Stepping Motors

Part No.	Supply Voltage (V)	Applications	ch	Drive System	Driver Output Max. Current (A)	Driver Output ON Resistance (Ω)	Input Interface	Input Mode Selection Terminal	Built-In Wave Sloping Comparator	UVLO	Temperature Protection	Power Save Function	Package (mm)
BD6360GUL	2.3 to 5.5	ex.1 <b>AF</b> Drive AF using piezo actuator. ex.2 <b>ZOOM</b> Drive ZOOM using stepping motor.	2	FULL ON	0.5	1.0 (V <sub>CC</sub> =3V, I <sub>O</sub> =0.4A)	Parallel	✓	✓	✓	✓	✓	VCSP50L2 (2.1 × 2.1) H=0.55Max.

## 2-wire Serial (I<sup>2</sup>C-compatible) Interface Lens Driver for Piezo Actuators

Part No.	Supply Voltage (V)	Applications	ch	Drive System	Driver Output Max. Current (A)	Driver Output ON Resistance (Ω)	Input Interface	Base Clock	UVLO	Temperature Protection	Power Save Function	Package (mm)
BU64562GWZ	V <sub>CC</sub> : 2.3 to 4.8	ex.1 <b>AF</b> Drive AF using piezo actuator. ex.2 <b>ZOOM</b> Drive ZOOM using piezo actuator.	1	FULL ON	0.5	1.4 (V <sub>CC</sub> =3V)	I <sup>2</sup> C compatible	Built-in 15MHz	✓	✓	✓	UCSP30L1 (1.90 × 0.77) H=0.33Max.

## Bi-directional VCM Drivers

Part No.	Supply Voltage (V)	Applications	ch	Drive System	Driver Output Max. Current (A)	Driver Output Low Voltage (V)	Input Interface	Ring Compensation	UVLO	Temperature Protection	Power Save Function	Package (mm)
BU64295GWZ	2.3 to 4.8	<b>AF</b> Drive AF using voice coil motor.	1	Constant current (±5%)	±0.100	0.20 (V <sub>CC</sub> =3V, I <sub>O</sub> =0.1A)	I <sup>2</sup> C compatible	ISRC	—	✓	✓	UCSP30L1 (0.77 × 1.2) H=0.33Max.
BU64296GWX	2.3 to 4.8	<b>AF</b> Drive AF using voice coil motor.	1	Constant current (±5%)	±0.100	0.20 (V <sub>CC</sub> =3V, I <sub>O</sub> =0.1A)	I <sup>2</sup> C compatible	ISRC	—	✓	✓	UCSP16X1 (0.77 × 1.2) H=0.20Max.
<b>New</b> BU64297GWZ	2.3 to 4.8	<b>AF</b> Drive AF using voice coil motor.	1	Constant current (±5%)	±0.100	0.20 (V <sub>CC</sub> =3V, I <sub>O</sub> =0.1A)	I <sup>2</sup> C compatible	ISRC	—	✓	✓	UCSP35L1 (0.77 × 1.2) H=0.36Max.

**AF**=Auto Focus **ZOOM**=Zoom