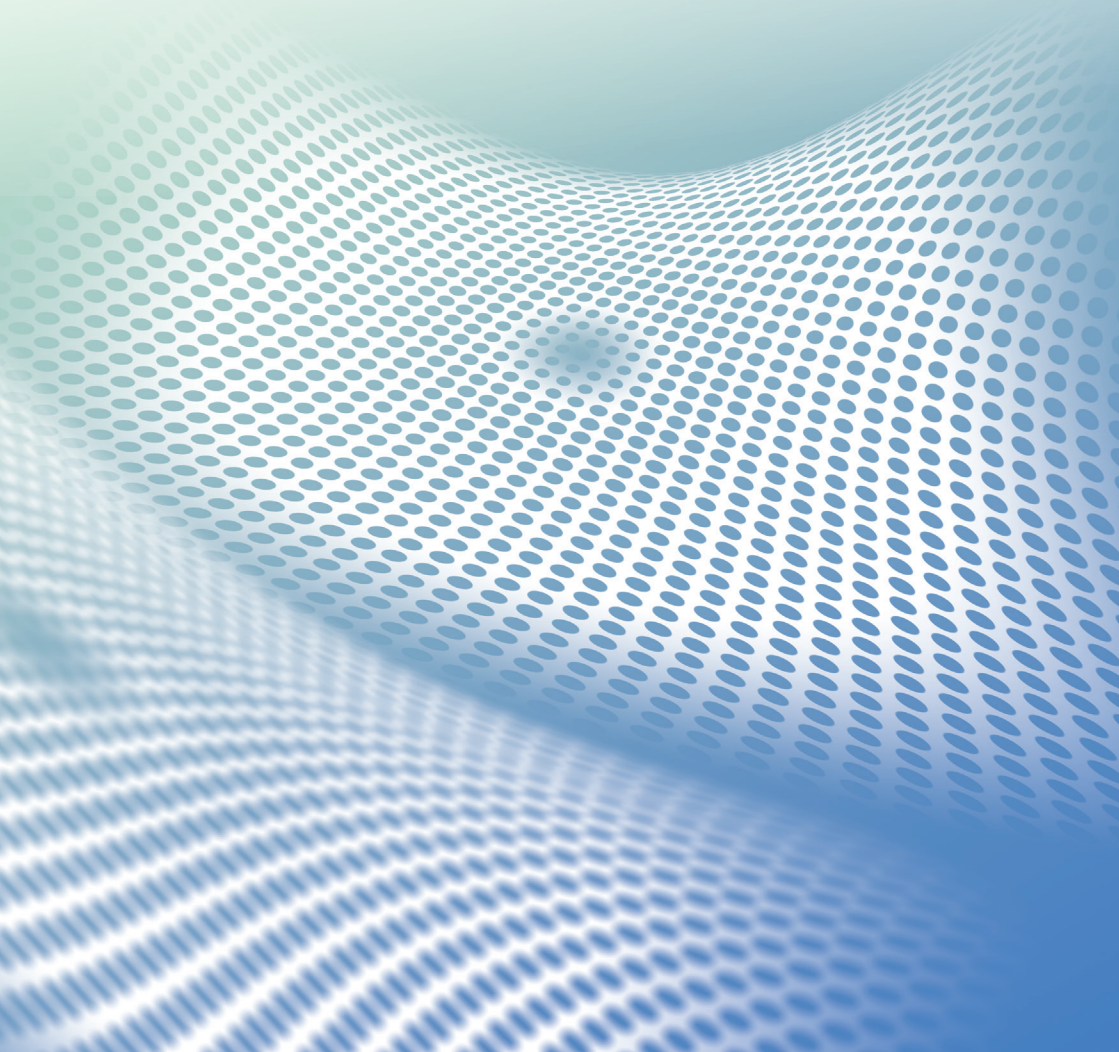




TOSHIBA

Selection Guide 2024

Motor Driver ICs

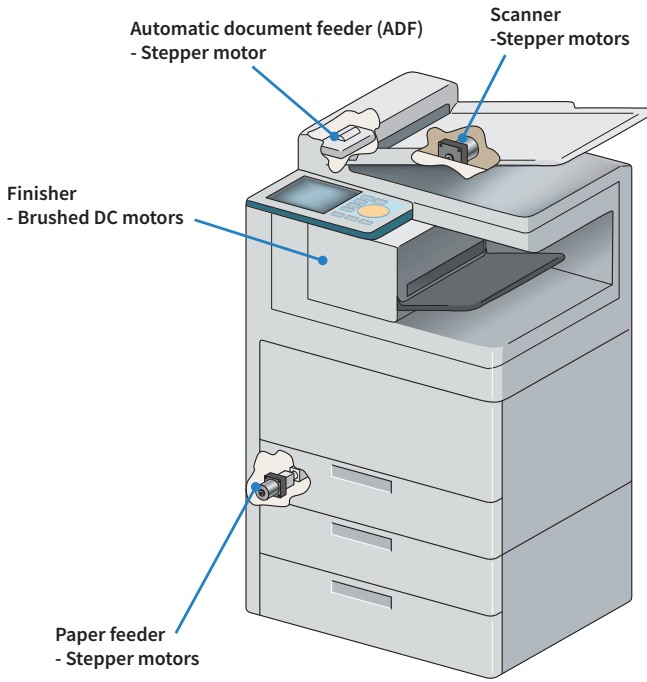


Contents

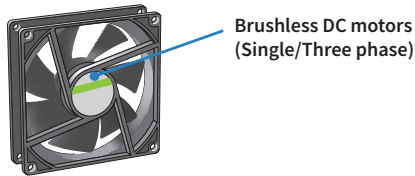
1. Applications	3 - 6
2. Product list	7 - 17
■ Brushed DC motor drivers	
■ Stepping motor drivers	
■ Brushless DC motor drivers (Controller)	
■ Brushless DC motor drivers (Pre Driver / Driver)	
■ Transistor Arrays	
■ Three-Phase Brushless DC Motor Driver ICs (with Built-in Power Device)	
■ Low Voltage IPDs (Intelligent Power Devices)	
3. Device Packages	18 - 23

1. Applications

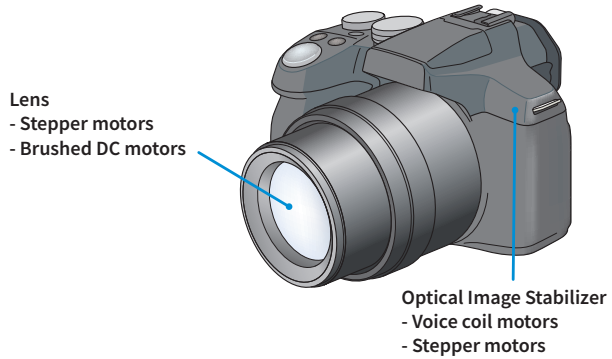
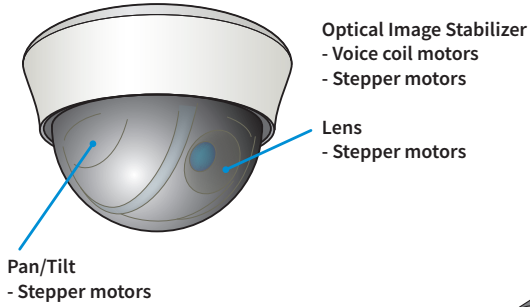
For multi-function printers



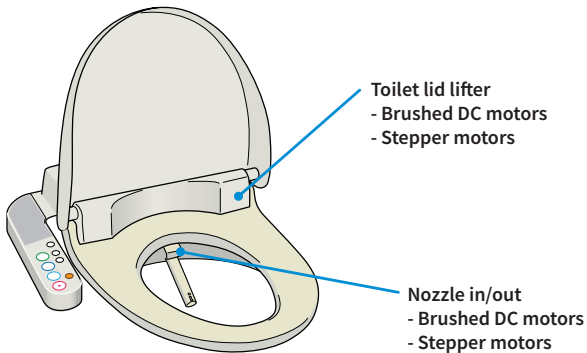
For fans (cooling fan, blower, etc.)



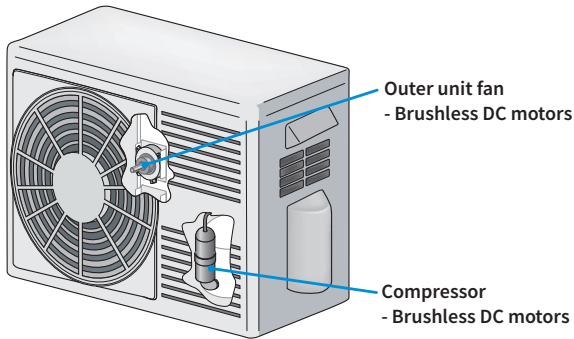
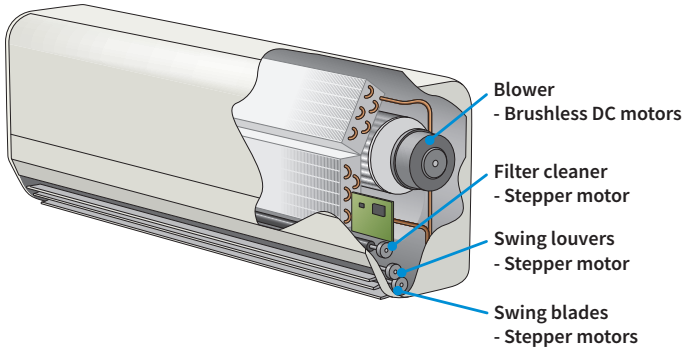
For surveillance cameras and digital cameras



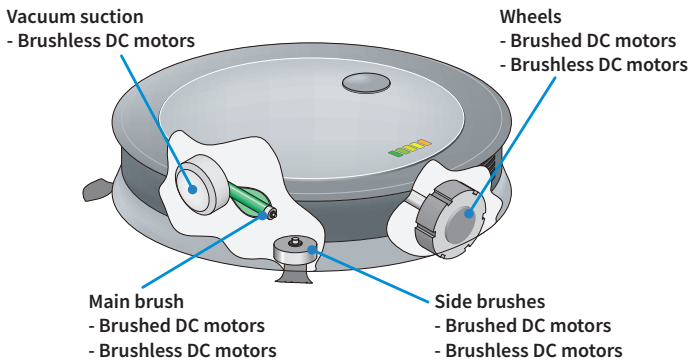
For automatic toilets etc.



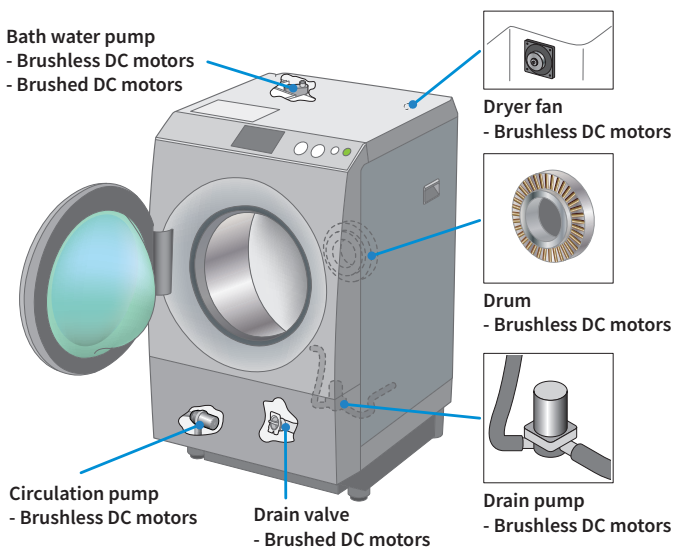
For air conditioners



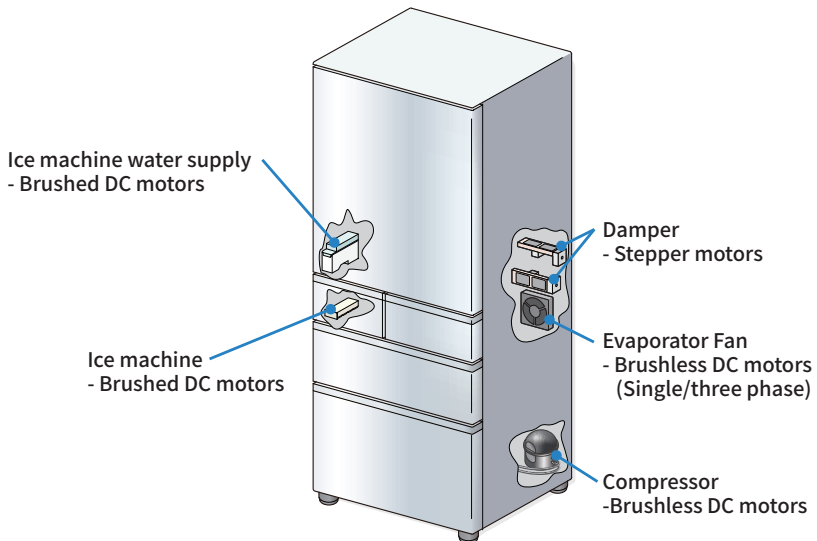
For vacuum cleaners and robot vacuums



For washing machines



For refrigerators



2. Product list

■ Brushed DC motor drivers

Part Number	Absolute Maximum Ratings		Output R _{on}	Circuits (ch)	C.C. PWM	ISD *1), *3)	TSD *2), *3)	Package	Note *5)
	Voltage (V)	Current (peak) (A)							
TB6613FTG	6	0.8	1.5	8	●		◇	QON44	
TC78H651AFNG	8	2.0	0.22	2		○	◇	TSSOP16	
TC78H653FTG	8	2.0 / 4.0 *4)	0.22 / 0.11 *4)	2 / 1 *4)		○	◇	QFN16	Large Mode
TB6552FNG	15	1.0	1.5	2			◇	SSOP16	
TB6552FTG	15	1.0	1.5	2			◇	QFN16	
TB6612FNG	15	3.2	0.5	2			◇	SSOP24	
TC78H600FNG	18	1.0	1.2	2	●	○	◇	SSOP20	
TC78H600FTG	18	1.0	1.2	2	●	○	◇	QFN24	
TC78H610FNG	18	1.0	1.2	2		○	◇	SSOP16	
TC78H611FNG	18	1.1	0.8	2		○	◇	TSSOP16	
TC78H620FNG	18	1.0	1.2	2		○	◇	SSOP16	
TC78H621FNG	18	1.1	0.8	2		○	◇	TSSOP16	
TC78H630FNG	18	2.1	0.4	1		○	◇	TSSOP16	
TC78H660FNG	20	2.0	0.48	2	●	○	○	TSSOP16	
TC78H660FTG	20	2.0	0.48	2	●	○	○	QFN16	
TB62212FNG	40	2.0 / 4.0 *4)	2.20 / 1.10 *4)	4 / 2 *4)	●	○	○	HTSSOP48	Large Mode
TB62212FTAG	40	2.0 / 4.0 *4)	2.20 / 1.10 *4)	4 / 2 *4)	●	○	○	QFN48	Large Mode
TB62216FG	40	2.5	1.0	2	●	○	○	HSOP28	
TB62216FNG	40	2.5	1.0	2	●	○	○	HTSSOP48	
TB62216FTG	40	2.5	1.0	2	●	○	○	QFN48	
TB6561FG	40	1.5	1.5	2		◇	◇	SSOP30	
TB6640AFTG	40	3.0	1.0	1	●	○ / ◇	○ / ◇	QFN48	
TB6640FTG	40	3.0	1.0	1	●	○ / ◇	○ / ◇	QFN48	
TB67H301FTG	40	3.0	1.0	1	●	○ / ◇	○ / ◇	QFN24	
TB67H452FTG	40	3.5 / 5.0 *4)	0.60 / 0.30 *4)	4 / 2 *4)	●	○	○	QFN48	Large Mode
TC78S121FNG	40	3.5 / 5.0 *4)	0.60 / 0.30 *4)	4 / 2 *4)	●	○	○	HTSSOP48	Large Mode
TC78S121FTG	40	3.5 / 5.0 *4)	0.60 / 0.30 *4)	4 / 2 *4)	●	○	○	QFN48	Large Mode
TC78S122FNG	40	3.5 / 5.0 *4)	0.60 / 0.30 *4)	4 / 2 *4)	●	○	○	HTSSOP48	Large Mode
TC78S122FTG	40	3.5 / 5.0 *4)	0.60 / 0.30 *4)	4 / 2 *4)	●	○	○	QFN48	Large Mode
TB6559FG	50	2.5	1.3	1	●	◇	◇	HSOP16	
TB6569FG	50	4.5	0.55	1	●	○	○	HSOP16	
TB6569FTG	50	4.5	0.55	1	●	○	○	QFN32	

*1) ISD: Over-current shutdown

*2) TSD: Thermal shutdown

*3) ○: Latched, ◇: Auto-retry

*4) Large mode

*5) Large mode available

Part Number	Absolute Maximum Ratings		Output R _{ON}	Circuits (ch)	C.C. PWM	ISD *1), *3)	TSD *2), *3)	Package	Note *5)
	Voltage (V)	Current (peak) (A)							
TB6641FG	50	4.5	0.55	1	●	○	○	HSOP16	
TB6641FTG	50	4.5	0.55	1	●	○	○	QFN32	
TB6642FG	50	4.5	0.55	1		○ / ◇	○ / ◇	HSOP16	
TB6642FTG	50	4.5	0.55	1		○ / ◇	○ / ◇	QFN32	
TB67H302HG	50	5.0	0.4	2	●	○	○	HZIP25	
TB67H303HG	50	10.0	0.2	1	●	○	○	HZIP25	
TB67H400AFNG	50	4.0 / 8.0 *4)	0.49 / 0.25 *4)	2 / 1 *4)	●	○	○	HTSSOP48	Large Mode
TB67H400AFTG	50	4.0 / 8.0 *4)	0.49 / 0.25 *4)	2 / 1 *4)	●	○	○	QFN48	Large Mode
TB67H400AHG	50	4.0 / 8.0 *4)	0.49 / 0.25 *4)	2 / 1 *4)	●	○	○	HZIP25	Large Mode
TB67H400ANG	50	4.0 / 8.0 *4)	0.49 / 0.25 *4)	2 / 1 *4)	●	○	○	SDIP24	Large Mode
TB67H401FTG	50	4.0 / 8.0 *4)	0.49 / 0.25 *4)	2 / 1 *4)	●	○	○	QFN48	Large Mode
TB67H410FTG	50	2.5 / 5.0 *4)	0.80 / 0.40 *4)	2 / 1 *4)	●	○	○	QFN48	Large Mode
TB67H410NG	50	2.5 / 5.0 *4)	0.80 / 0.40 *4)	2 / 1 *4)	●	○	○	SDIP24	Large Mode
TB67H420FTG	50	4.5 / 9.0 *4)	0.33 / 0.17 *4)	2 / 1 *4)	●	○	○	QFN48	Large Mode
TB67H450FNG	50	3.5	0.6	1	●	○	◇	SSOP8	
TB67H450AFNG	50	3.5	0.6	1	●	○	◇	SSOP8	
TB67H451FNG	50	3.5	0.6	1	●	◇	◇	SSOP8	
TB67H451AFNG	50	3.5	0.6	1	●	◇	◇	SSOP8	
TB67H480FNG ☆	50	2.5	0.4	2	●	○	◇	HTSSOP28	
TB67H481FNG ☆	50	2.5	0.4	2	●	○	◇	HTSSOP28	
TB67H481FTG ☆	50	3.0	0.4	2	●	○	◇	QFN32	

☆ New Products

*1) ISD: Over-current shutdown

*2) TSD: Thermal shutdown

*3) ○: Latched, ◇: Auto-retry

*4) Large mode

*5) Large mode available

Stepping motor drivers

Part Number	Motor Type		Interface			Absolute Maximum Ratings		Stepping Mode		ISD *2)	TSD *3)	Package	Note *1)
	Bipolar	Unipolar	Clock	Phase	Serial	Voltage (V)	Current (A)	Constant Current Cont.	Max Resolution				
TB6613FTG	●		●		●	6	0.8	●	1/64		●	QON44	
TB6608FNG	●		●			15	0.8	●	1/8		●	SSOP20	
TC78H670FTG	●		●		●	20	2.0	●	1/128	●	●	QFN16	ACDS
TC78S600FNG	●		●			18	1.0	●	1/16	●	●	SSOP20	
TC78S600FTG	●		●			18	1.0	●	1/16	●	●	QFN24	
TB6615PG		●	●			28	0.4		1/2			DIP16	
TB62211FNG	●		●			40	1.0	●	1/4	●	●	HTSSOP24	
TB62214AFG	●		●			40	2.0	●	1/4	●	●	HSOP28	
TB62214AFNG	●		●			40	2.0	●	1/4	●	●	HTSSOP48	
TB62214AFTG	●		●			40	2.0	●	1/4	●	●	QFN48	
TB62215AFG	●		●			40	3.0	●	1/4	●	●	HSOP28	
TB62215AFNG	●		●			40	3.0	●	1/4	●	●	HTSSOP48	
TB62215AFTG	●		●			40	3.0	●	1/4	●	●	QFN48	
TB62215AHQ	●		●			40	3.0	●	1/4	●	●	HZIP25	
TB62262FTAG	●		●			40	1.5	●	1/4	●	●	QFN36	
TB62262FTG	●		●			40	1.8	●	1/4	●	●	QFN48	
TB62269FTAG	●		●			40	1.8	●	1/32	●	●	QFN32	
TB62269FTG	●		●			40	1.8	●	1/32	●	●	QFN48	
TB6560AFG	●		●			40	2.5	●	1/16		●	HQFP64	
TB6560AFTG	●		●			40	2.5	●	1/16		●	QFN48	
TB6560AHQ	●		●			40	3.5	●	1/16		●	HZIP25	
TB67H452FTG	●		●			40	3.5 × 2	●	1/8	●	●	QFN48	
TB67S215FTAG	●		●			40	2.5	●	1/8	●	●	QFN36	
TB67S508FTG	●		●	●		40	3	●	1/8	●	●	QFN36	ACDS/ADMD
TB67S512FTAG	●		●			40	2	●	1/8	●	●	QFN36	
TB67S522FTAG	●		●			40	2.8	●	1/8	●	●	QFN36	
TC78S122FNG	●		●			40	2.0 × 2	●	1/8	●	●	HTSSOP48	
TC78S122FTG	●		●			40	2.0 × 2	●	1/8	●	●	QFN48	
TB67S539FTG	●		●			40	2.0	●	1/32	●	●	QFN32	ACDS/ADMD
TB67S539SFTG	●		●			40	2.0	●	1/32	●	●	QFN32	ACDS/ADMD
TB67S549FTG	●		●			40	1.5	●	1/32	●	●	QFN24	ACDS/ADMD
TB6600FG	●		●			50	5.0	●	1/16	●	●	HQFP64	
TB6600HG	●		●			50	5.0	●	1/16	●	●	HZIP25	
TB67S102AFNG	●		●			50	4.0	●	1/4	●	●	HTSSOP48	ADMD
TB67S102AFTG	●		●			50	4.0	●	1/4	●	●	QFN48	ADMD
TB67S103AFTG	●		●		(●)*4)	50	4.0	●	1/32	●	●	QFN48	ADMD
TB67S109AFNG	●		●			50	4.0	●	1/32	●	●	HTSSOP48	ADMD
TB67S109AFTG	●		●			50	4.0	●	1/32	●	●	QFN48	ADMD
TB67S128FTG	●		●			50	5.0	●	1/128	●	●	QFN64	AGC/ACDS/ADMD

*1) AGC: Active Gain Control
ADMD: Advanced Dynamic Mixed Decay
ACDS: Advanced Current Detect System

*2) ISD: Over-current detection

*3) TSD: Thermal shutdown

*4) Setup data: serial-in

Part Number	Motor Type		Interface			Absolute Maximum Ratings		Stepping Mode		ISD *2)	TSD *3)	Package	Note *1)
	Bipolar	Unipolar	Clock	Phase	Serial	Voltage (V)	Current (A)	Constant Current Cont.	Max Resolution				
TB67S209FTG	●		●			50	4.0	●	1/32	●	●	QFN48	
TB67S249FTG	●		●			50	4.5	●	1/32	●	●	QFN48	AGC/ACDS /ADMD
TB67S269FTG	●		●			50	2.0	●	1/32	●	●	QFN48	
TB67S279FTG	●		●			50	2.0	●	1/32	●	●	QFN48	AGC/ACDS /ADMD
TB67S289FTG	●		●			50	3.0	●	1/32	●	●	QFN48	AGC/ACDS /ADMD
TB67S580FNG ☆	●		●			50	1.6	●	1/32	●	●	HTSSOP28	
TB67S581FNG ☆	●		●			50	2.5	●	1/32	●	●	HTSSOP28	
TB67S569FTG ☆	●		●			40	2.0	●	1/32	●	●	QFN32	ADMD
TB67S589FNG ☆	●		●			50	3.0	●	1/32	●	●	HTSSOP28	ACDS/ADMD
TB67S589FTG ☆	●		●			50	3.0	●	1/32	●	●	QFN32	ADMD
TB67S158FTG		●		● *5)	●	80	1.5 × 2		1/2	●	●	QFN48	
TB67S158NG		●		● *5)	●	80	1.5 × 2		1/2	●	●	SDIP24	
TB67S179FTG		●	●			80	1.5	●	1/32	●	●	QFN48	ACDS
TB67S142FTG		●	●			84	3.0	●	1/4	●	●	QFN48	ACDS
TB67S142HG		●	●			84	3.0	●	1/4	●	●	HZIP25	ACDS
TB67S142NG		●	●			84	3.0	●	1/4	●	●	SDIP24	ACDS
TB67S149FG		●	●			84	3.0	●	1/32	●	●	HSSOP28	ACDS
TB67S149FTG		●	●			84	3.0	●	1/32	●	●	QFN48	ACDS
TB67S149AFTG		●	●			84	3.0	●	1/32	●	●	QFN48	ACDS
TB67S149HG		●	●			84	3.0	●	1/32	●	●	HZIP25	ACDS
TC78H651AFNG	●			●		8	2.0		1/2	●	●	TSSOP16	
TC78H653FTG	●			●		8	2.0		1/2	●	●	QFN16	
TC78H611FNG	●			●		18	1.1		1/2	●	●	TSSOP16	
TC78H621FNG	●			●		18	1.1		1/2	●	●	TSSOP16	
TC78H660FNG	●			●		20	2.0	●	1/2	●	●	TSSOP16	ACDS
TC78H660FTG	●			●		20	2.0	●	1/2	●	●	QFN16	ACDS
TB6674FAG	●			●		24	0.2		Full	●	●	SSOP16	
TB6674FG	●			●		24	0.4		Full	●	●	HSOP16	
TB6674PG	●			●		24	0.4		Full	●	●	DIP16	
TB62208FG	●			●		40	1.8	●	1/2	●	●	HSOP28	
TB62208FNG	●			●		40	1.8	●	1/1	●	●	HTSSOP48	
TB62208FTG	●			●		40	1.8	●	1/2	●	●	QFN48	
TB62210FNG	●			●		40	1.0	●	1/4	●	●	HTSSOP24	
TB62212FNG	●			●		40	1.5 × 2	●	1/2	●	●	HTSSOP48	
TB62212FTAG	●			●		40	1.5 × 2	●	1/2	●	●	QFN48	
TB62213AFG	●			●		40	3.0	●	1/4	●	●	HSOP28	
TB62213AFNG	●			●		40	3.0	●	1/4	●	●	HTSSOP48	

☆ New Products

*1) AGC: Active Gain Control

ADMD: Advanced Dynamic Mixed Decay

ACDS: Advanced Current Detect System

*2) ISD: Over-current detection

*3) TSD: Thermal shutdown

*5) Parallel mode

■ Stepping motor drivers

Part Number	Motor Type		Interface			Absolute Maximum Ratings		Stepping Mode		ISD *2)	TSD *3)	Package	Note *1)
	Bipolar	Unipolar	Clock	Phase	Serial	Voltage (V)	Current (A)	Constant Current Cont.	Max Resolution				
TB62213AFTG	●			●		40	3.0	●	1/4	●	●	QFN48	
TB62213AHQ	●			●		40	3.0	●	1/4	●	●	HZIP25	
TB62218AFG	●			●		40	2.0	●	1/4	●	●	HSOP28	
TB62218AFNG	●			●		40	2.0	●	1/4	●	●	HTSSOP48	
TB62218AFTG	●			●		40	2.0	●	1/4	●	●	QFN48	
TB62261FTAG	●			●		40	1.5	●	1/4	●	●	QFN36	
TB62261FTG	●			●		40	1.8	●	1/4	●	●	QFN48	
TB6562AFG	●			●		40	1.5	●	1/4	●	●	SSOP30	
TB67S213FTAG	●			●		40	2.5	●	1/4	●	●	QFN36	
TB67S511FTAG	●			●		40	2.0	●	1/4	●	●	QFN36	
TB67S521FTAG	●			●		40	2.8	●	1/4	●	●	QFN36	
TC78S121FNG	●			●		40	2.0 × 2	●	1/4	●	●	HTSSOP48	
TC78S121FTG	●			●		40	2.0 × 2	●	1/4	●	●	QFN48	
TB67S101AFNG	●			●		50	4.0	●	1/4	●	●	HTSSOP48	ADMD
TB67S101AFTG	●			●		50	4.0	●	1/4	●	●	QFN48	ADMD
TB67S101ANG	●			●		50	4.0	●	1/4	●	●	SDIP24	ADMD
TB67S105FTG	●				●	50	3.0	●	1/2	●	●	QFN48	
TB67S261FTG	●			●		50	2.0	●	1/4	●	●	QFN48	ADMD
TB67S265FTG	●				●	50	2.0	●	1/2	●	●	QFN48	ADMD
TB67S285FTG	●				●	50	3.0	●	1/2	●	●	QFN48	AGC/ACDS /ADMD
TB67S111PG		●		●	*5)	80	1.5		1/2	●	●	DIP16	
TB67S141FTG		●		●		84	3.0	●	1/4	●	●	QFN48	ACDS
TB67S141AFTG		●		●		84	3.0	●	1/4	●	●	QFN48	ACDS
TB67S141HNG		●		●		84	3.0	●	1/4	●	●	HZIP25	ACDS
TB67S141NG		●		●		84	3.0	●	1/4	●	●	SDIP24	ACDS
TB67S145FTG		●			●	84	3.0	●	1/2	●	●	QFN48	ACDS

*1) AGC: Active Gain Control
 ADMD: Advanced Dynamic Mixed Decay
 ACDS: Advanced Current Detect System

*2) ISD: Over-current detection

*3) TSD: Thermal shutdown

*5) Parallel mode

■ Brushless DC motor drivers (Controller)

Part Number	Phases		Controller	Pre Driver	Driver	Absolute Maximum Ratings		Commutation		Lead Angle Control				Package	Note *1)
	3-Phase	1-Phase				Voltage (V)	Current (A)	Square	Sine	External Input	Auto (current FB)	Auto (rpm FB)	Auto (Intelligent Phase Control)		
TB6575FNG	●		●			5.5	0.02	●		●				SSOP24	Sensorless
TB6551FAG	●		●			12	0.002		●	●				SSOP24	3 Hall
TB6556FG	●		●			12	0.002		●	●	●			SSOP30	3 Hall
TB6584AFNG	●		●			18	0.002		●	●	●			SSOP30	3 Hall
TB6584FNG	●		●			18	0.002		●	●	●			SSOP30	3 Hall
TB6586AFG	●		●			18	0.002	●		●				SSOP24	3 Hall
TB6586BFG	●		●			18	0.002	●		●				SSOP24	3 Hall
TB6586FG	●		●			18	0.002	●		●				SSOP24	3 Hall
TB6631FNG	●		●			18	0.002		●	●		●		SSOP30	3 Hall
TB6634FNG	●		●			18	0.002		●	●	●			SSOP30	3 Hall
TB67B054FTG	●		●			18	0.002		●	●	●			QFN32	3 Hall
TC78B041FNG	●		●			18	0.002		●	●			●	SSOP30	3 Hall
TC78B042FTG	●		●			18	0.002		●	●			●	QFN32	3 Hall

*1) Hall type or Sensorless

■ Brushless DC motor drivers (Pre Driver / Driver)

Part Number	Phases		Controller	Pre Driver	Driver	Absolute Maximum Ratings		Commutation		Lead Angle Control				Package	Note *1)
	3-Phase	1-Phase				Voltage (V)	Current (A)	Square	Sine	External Input	Auto (current FB)	Auto (rpm FB)	Auto (Intelligent Phase Control)		
TC78B002FNG		●			●	18	1.5	●	●	●				SSOP16	1 Hall
TC78B002FTG		●			●	18	1.5	●	●	●				QFN16	1 Hall
TC78B025FTG	●				●	18	4	●	●	●		●	●	QFN24	1 Hall Closed Loop
TC78B027FTG	●			●		18	0.2	●	●	●		●	●	QFN24	1 Hall Closed Loop
TB6633AFNG	●				●	25	1	●		●				SSOP24	Sensorless
TB6633FNG	●				●	25	1	●		●				SSOP24	Sensorless
TB67B001BFTG	●				●	25	3	●		●		●		QFN36	Sensorless
TB67B001AFTG	●				●	25	3	●		●		●		QFN36	Sensorless
TB67B001FTG	●				●	25	3	●		●		●		QFN36	Sensorless
TB67B008AFNG	●				●	25	3	●	●	●		●		SSOP24	Sensorless
TB67B008AFTG	●				●	25	3	●		●		●		QFN24	Sensorless
TB67B008BFG	●				●	25	3	●		●		●		SSOP24	Sensorless
TB67B008BFTG	●				●	25	3	●		●		●		QFN24	Sensorless
TB67B008CFNG	●				●	25	3	●		●		●		SSOP24	Sensorless
TB67B008CFTG	●				●	25	3	●		●		●		QFN24	Sensorless
TB67B008FNG	●				●	25	3	●		●		●		SSOP24	Sensorless
TB67B008FTG	●				●	25	3	●		●		●		QFN24	Sensorless
TB67Z800FTG	●				●	25	3							QFN36	-
TC78B015FTG	●				●	25	3	●		●		●		QFN36	1 Hall
TB6603FTG	●			●		30	0.02		●	●				QFN36	3 Hall
TB6604FTG	●			●		30	0.02		●		●			QFN48	3 Hall

*1) Hall type or Sensorless, Built-in Closed loop function

■ Brushless DC motor drivers (Pre Driver / Driver)

Part Number	Phases		Controller	Pre Driver	Driver	Absolute Maximum Ratings		Commutation		Lead Angle Control				Package	Note *1)
	3-Phase	1-Phase				Voltage (V)	Current (A)	Square	Sine	External Input	Auto (current FB)	Auto (rpm FB)	Auto (Intelligent Phase Control)		
TB6605FTG	●			●		30	0.02		●	●		●	QFN36	3 Hall	
TC78B009FTG	●			●		30	0.24	●		●		●	QFN36	Sensorless Closed Loop	
TC78B011FTG	●			●		30	0.24		●	●		●	QFN36	Sensorless Closed Loop	
TC78B004AFTG	●			●		31	0.1		●		●		QFN40	3 Hall	
TC78B015AFTG	●			●		36	3	●		●		●	QFN36	1 Hall	
TC78B006AFNG		●		●		40	0.02	●	●				SSOP16	1 Hall	
TC78B006AFTG		●		●		40	0.02	●	●				QFN16	1 Hall	
TC78B006BFNG		●		●		40	0.02	●	●				SSOP16	1 Hall	
TC78B006BFTG		●		●		40	0.02	●	●				QFN16	1 Hall	
TC78B006CFNG		●		●		40	0.02	●	●				SSOP16	1 Hall	
TC78B006CFTG		●		●		40	0.02	●	●				QFN16	1 Hall	
TC78B006FNG		●		●		40	0.02	●	●				SSOP16	1 Hall	
TC78B006FTG		●		●		40	0.02	●	●				QFN16	1 Hall	
TC78B016FTG	●			●		40	3		●		●	●	QFN36	3 Hall	
TB6585AFTG	●			●		45	1.8		●	●	●		QFN48	3 Hall	
TB67B000AFG	●			●		600	2	●	●	●			HSSOP34	3 Hall	
TB67B000AHG	●			●		600	2	●	●	●			HDIP30	3 Hall	

*1) Hall type or Sensorless, Built-in Closed loop function

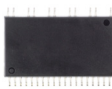
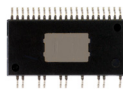
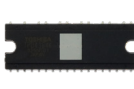
■ Transistor Arrays

Part Number	Type		Absolute Maximum Ratings		Input Level	Input Voltage Range (V)	Inductive Load	Common Diode	Package
	Output Type	Number of Circuits	Output Voltage (V)	Output Current (A)					
TBD62064APG	Sink	4ch	50	1.5	High	2.5 to 25	●	●	DIP16
TBD62064AFG	Sink	4ch	50	1.5	High	2.5 to 25	●	●	HSOP16
TBD62064AFAG	Sink	4ch	50	1.5	High	2.5 to 25	●	●	SSOP24
TBD62308APG	Sink	4ch	50	1.5	Low	0 to $V_{CC}-3.5V$	●	●	DIP16
TBD62308AFG	Sink	4ch	50	1.5	Low	0 to $V_{CC}-3.5V$	●	●	HSOP16
TB62308AFAG	Sink	4ch	50	1.5	Low	0 to $V_{CC}-3.5V$	●	●	SSOP24
TBD62003APG	Sink	7ch	50	0.5	High	2.5 to 25	●	●	DIP16
TBD62003AFG	Sink	7ch	50	0.5	High	2.5 to 25	●	●	SOP16
TBD62003AFNG	Sink	7ch	50	0.5	High	2.5 to 25	●	●	SSOP16
TBD62003AFWG	Sink	7ch	50	0.5	High	2.5 to 25	●	●	SOL16
TBD62004APG	Sink	7ch	50	0.5	High	7.0 to 25	●	●	DIP16
TBD62004AFG	Sink	7ch	50	0.5	High	7.0 to 25	●	●	SOP16
TBD62004AFNG	Sink	7ch	50	0.5	High	7.0 to 25	●	●	SSOP16
TBD62004AFWG	Sink	7ch	50	0.5	High	7.0 to 25	●	●	SOL16
TBD62304APG	Sink	7ch	50	0.5	Low	-20 to $V_{CC}-3.5V$			DIP16
TBD62304AFNG	Sink	7ch	50	0.5	Low	-20 to $V_{CC}-3.5V$			SSOP16

Part Number	Type		Absolute Maximum Ratings		Input Level	Input Voltage Range (V)	Inductive Load	Common Diode	Package
	Output Type	Number of Circuits	Output Voltage (V)	Output Current (A)					
TBD62304AFWG	Sink	7ch	50	0.5	Low	-20 to $V_{CC}-3.5V$			SOL16
TBD62502APG	Sink	7ch	50	0.3	High	14.0 to 25			DIP16
TBD62502AFG	Sink	7ch	50	0.3	High	14.0 to 25			SOP16
TBD62502AFNG	Sink	7ch	50	0.3	High	14.0 to 25			SSOP16
TBD62502AFWG	Sink	7ch	50	0.3	High	14.0 to 25			SOL16
TBD62503APG	Sink	7ch	50	0.3	High	2.5 to 25			DIP16
TBD62503AFG	Sink	7ch	50	0.3	High	2.5 to 25			SOP16
TBD62503AFNG	Sink	7ch	50	0.3	High	2.5 to 25			SSOP16
TBD62503AFWG	Sink	7ch	50	0.3	High	2.5 to 25			SOL16
TBD62083APG	Sink	8ch	50	0.5	High	2.5 to 25	●	●	DIP18
TBD62083AFG	Sink	8ch	50	0.5	High	2.5 to 25	●	●	SOP18
TBD62083AFNG	Sink	8ch	50	0.5	High	2.5 to 25	●	●	SSOP18
TBD62083AFWG	Sink	8ch	50	0.5	High	2.5 to 25	●	●	SOL18
TBD62183AFNG	Sink	8ch	50	0.05	High	2.5 to 25	●	●	SSOP18
TBD62183AFWG	Sink	8ch	50	0.05	High	2.5 to 25	●	●	SOL18
TBD62084APG	Sink	8ch	50	0.5	High	7.0 to 25	●	●	DIP18
TBD62084AFG	Sink	8ch	50	0.5	High	7.0 to 25	●	●	SOP18
TBD62084AFNG	Sink	8ch	50	0.5	High	7.0 to 25	●	●	SSOP18
TBD62084AFWG	Sink	8ch	50	0.5	High	7.0 to 25	●	●	SOL18
TBD62089APG	Sink	8ch	50	0.5	High	$0.7 \times V_{DD}$ to V_{DD}			DIP20
TBD62381APG	Sink	8ch	50	0.5	High	2.0 to 25			DIP18
TBD62381AFNG	Sink	8ch	50	0.5	High	2.0 to 25			SSOP18
TBD62381AFWG	Sink	8ch	50	0.5	High	2.0 to 25			SOL18
TBD62384APG	Sink	8ch	50	0.5	Low	-20 to $V_{CC}-3.5$			DIP18
TBD62384AFWG	Sink	8ch	50	0.5	Low	-20 to $V_{CC}-3.5$			SOL18
TBD62387APG	Sink	8ch	50	0.5	Low	0 to $V_{CC}-3.5$	●	●	DIP20
TBD62387AFNG	Sink	8ch	50	0.5	Low	0 to $V_{CC}-3.5$	●	●	SSOP20
TBD62781APG	Source	8ch	50	-0.5	High	2.0 to 25			DIP18
TBD62781AFWG	Source	8ch	50	-0.5	High	2.0 to 25			SOL18
TBD62783APG	Source	8ch	50	-0.5	High	2.0 to 25	●	●	DIP18
TBD62783AFG	Source	8ch	50	-0.5	High	2.0 to 25	●	●	SOP18
TBD62783AFNG	Source	8ch	50	-0.5	High	2.0 to 25	●	●	SSOP18
TBD62783AFWG	Source	8ch	50	-0.5	High	2.0 to 25	●	●	SOL18
TBD62785APG	Source	8ch	50	-0.5	Low	0 to $V_{CC}-3.5$			DIP18
TBD62785AFWG	Source	8ch	50	-0.5	Low	0 to $V_{CC}-3.5$			SOL18
TBD62786APG	Source	8ch	50	-0.5	Low	-30 to -2.8	●	●	DIP18
TBD62786AFNG	Source	8ch	50	-0.5	Low	-30 to -2.8	●	●	SSOP18
TBD62786AFWG	Source	8ch	50	-0.5	Low	-30 to -2.8	●	●	SOL18
TBD62789APG	Source	8ch	50	-0.5	High	2.0 to 5.5	●	●	DIP20

■ Three-Phase Brushless DC Motor Driver ICs (with Built-in Power Device)

Package Dimensions (unit: mm)

SSOP30	HSSOP31	HDIP30
		
20.0 x 14.2	17.5 x 11.93	32.8 x 11.4

Square-wave PWM control type

Package	Part Number	V _{BB} (V)	I _{out} (A)	V _{CEsat} max (V)		Hall sensor input	FGC Rotate Pulse Select	Forward Reverse select	Protection Functions			
				High Side	Low Side				Current Limit	Over Current	TSD	UVLO
HSSOP31	TPD4162F	600	0.7	3	3	✓	✓	-	✓	✓	✓	✓
	TPD4166F	600	1	3	3	✓	✓	-	✓	✓	✓	✓

Sine-wave PWM control type

Package	Part Number	V _{BB} (V)	I _{out} (A)	V _{CEsat} max (V)		R _{DS(on)} max (Ω)		Protection Functions			Diagnosis Functions
				High Side	Low Side	High Side	Low Side	Over Current	TSD	UVLO	
SSOP30	TPD4206F	500	2.5	-	-	2.3	2.3	✓	✓	✓	✓
	TPD4204F	600	2.5	-	-	3.2	3.2	✓	✓	✓	✓
	TPD4207F	600	5	-	-	0.56	0.56	✓	✓	✓	✓
HSSOP31	TPD4163F ☆	600	1	3.3	3.3	-	-	✓	✓	✓	✓
	TPD4164F ☆	600	2	3.7	3.7	-	-	✓	✓	✓	✓
HDIP30	TPD4163K ☆	600	1	3.3	3.3	-	-	✓	✓	✓	✓
	TPD4164K ☆	600	2	3.7	3.7	-	-	✓	✓	✓	✓
	TPD4165K ★	600	3	3.3	3.3	-	-	✓	✓	✓	✓

☆ New Products, ★ Under Development (The specification is subject to change without notice.)

Three-Phase Brushless DC Motor Driver ICs (with Built-in Power Device)

Ex.) TPD 41 62 F

① ② ③ ④

① TPD means intelligent power device [Three-Phase Brushless DC Motor Driver (with Built-in Power Device)]

② Three-phase brushless DC motor driver

41: Monolithic type

42: Multi-Chip module type

③ Serial number

④ Package

F: HSSOP31 or SSOP30

K: HDIP30

■ Low Voltage IPDs (Intelligent Power Devices)

Package Dimensions (unit: mm)

Industrial Driver ICs

PS-8	SSOP30
	
2.9 x 2.8	10.2 x 7.6

High-side Switch

Package	Part Number	V _{DD} (V)	I _{OUT} (A)	R _{DS(ON)} max (Ω)	V _{DD(OPR)} (V)	T _{OPR} (°C)	Protective Functions			Diagnosis Functions			Number of Switch channels
							Over Current	TSD	Active Clamp	Over Current	TSD	Open load	
SSOP30	TPD2015FN ☆@	-0.3 to 40	1	0.55	8 to 40	-40 to 110	✓	✓	-	-	-	-	8ch

Low-side Switches

Package	Part Number	V _{DS(DC)/V_{OUT}} (V)	I _{OUT} (A)	R _{DS(ON)} max (Ω)	V _{DD(OPR)} (V)	T _{OPR} (°C)	Protective Functions			Diagnosis Functions			Number of Switch channels
							Over Current	TSD	Active Clamp	Over Current	TSD	Open load	
PS-8	TPD1044F #	41	1	0.6	Up to 41	-40 to 125	✓	✓	✓	-	-	-	1ch
SSOP30	TPD2017FN ☆@	Up to 40	1	0.55	2.7 to 5.5	-40 to 110	✓	✓	✓	-	-	-	8ch

AEC-Q100 qualified

@ Dry-packed

☆ New Products

Part Naming Conventions

Low Voltage IPDs

Ex.) TPD 10 55 F A

① ② ③ ④ ⑤

① TPD means intelligent power device

② The type of topology

10: Single or dual switch

20: Multi output switch

71: High-side MOSFET gate driver

72: Bridge MOSFET gate driver

③ Serial number

④ Package

F: Surface mount type

FN: Flat Package (2 direction SOP Lead Pitch 0.65 mm)

⑤ Changes

The additional symbol which shows some changes.

3. Device Package

<p style="text-align: center;">DIP16 DIP16-P-300-2.54A</p> <p>Package dimension unit : mm</p> <p>Technical drawing of DIP16 package showing top, side, and pin views. Dimensions include: 19.75Max, 19.25, 0.95, 1.4, 3.5, 4.15, 2.54, 0.5, 3.3, 0.735Typ, 6.4, 7.62, 0~15°, 0.25.</p>	<p style="text-align: center;">DIP18 P-DIP18-300-2.54-001</p> <p>Package dimension unit : mm</p> <p>Technical drawing of DIP18 package showing top, side, and pin views. Dimensions include: 22.86, 6.40, 7.62, 0.21~0.35, 8.80, 0.40~0.80, 1.52, 2.54, 0.38~0.95, 4.80Max, 3.30, 1.30.</p>	<p style="text-align: center;">DIP20 DIP20-P-300-2.54A</p> <p>Package dimension unit : mm</p> <p>Technical drawing of DIP20 package showing top, side, and pin views. Dimensions include: 25.1Max, 24.6, 0.95, 4, 4.15, 4.15, 3.3, 0.871Typ, 2.54, 1.05, 6.4, 7.62, 0~15°, 0.25.</p>
<p style="text-align: center;">HDIP30 P-HDIP30-1233-1.78-001</p> <p>Package dimension unit : mm</p> <p>Technical drawing of HDIP30 package showing top, side, and pin views. Dimensions include: 32.8, 3.556, 1.728, 1.29, 1.4, 1.747, 0.8, 0.85, 1.6, 0.25, 13.5, 3.525, 33.3Max, 1.778, 0.46, 1.287Typ, 2.7.</p>	<p style="text-align: center;">HQFP64 HQFP64-P-1010-0.50</p> <p>Package dimension unit : mm</p> <p>Technical drawing of HQFP64 package showing top, side, and pin views. Dimensions include: 12.0, 10.0, 1.25Typ, 1.0, 1.2Max, 0.1, 11.0, 10.0, 12.0, 1.0, 0.5, 0.22, 1.25Typ, 0.145, 0.5.</p>	<p style="text-align: center;">HSOP16 HSOP16-P-300-1.00</p> <p>Package dimension unit : mm</p> <p>Technical drawing of HSOP16 package showing top, side, and pin views. Dimensions include: 3.4, 6.4, 3.6, 1.0Typ, 1.0, 0.4, 2.5, 0.25, 0.32, 13.5Max, 13.0, 2.3, 0.1, 2.25Max, 10.5.</p>
<p style="text-align: center;">HSOP28 HSOP28-P-0450-0.80</p> <p>Package dimension unit : mm</p> <p>Technical drawing of HSOP28 package showing top, side, and pin views. Dimensions include: 5.15, 2.34, 7.52, 10.2, 0.8, 1.34Typ, 0.254, 17.93, 2.69Max, 0.175.</p>	<p style="text-align: center;">HSSOP28 P-HSSOP28-0819-0.80-001</p> <p>Package dimension unit : mm</p> <p>Technical drawing of HSSOP28 package showing top, side, and pin views. Dimensions include: 5.15, 7.5, 9.9, 1.3Typ, 0.8, 0.35, 1.2Typ, 0.15, 18.6, 2.45Max, 0.1, 2.2.</p>	<p style="text-align: center;">HSSOP34 P-HSSOP34-0918-0.80-001</p> <p>Package dimension unit : mm</p> <p>Technical drawing of HSSOP34 package showing top, side, and pin views. Dimensions include: 2.4, 2.4, 6.4, 5.4, 8.4, 11.93, 0.75Typ, 0.8, 2.4, 0.32, 0.25, 10.5, 1.955Typ, 17.5, 2.2Max, 0.1.</p>

The drawing in the table above is a simplified version. Please check the target product data sheet for details of the package drawing.

<p style="text-align: center;">HTSSOP24 P-HTSSOP24-0508-0.65-001</p> <p>Package dimension unit: mm</p>	<p style="text-align: center;">HTSSOP28 P-HTSSOP28-0510-0.65-001</p> <p>Package dimension unit: mm</p>	<p style="text-align: center;">HTSSOP48 HTSSOP48-P-300-0.50</p> <p>Package dimension unit: mm</p>
--	--	---

<p style="text-align: center;">HZIP25 HZIP25-P-1.00F</p> <p>Package dimension unit: mm</p>	<p style="text-align: center;">HZIP25 HZIP25-P-1.27</p> <p>Package dimension unit: mm</p>	<p style="text-align: center;">QFN16 P-VQFN16-0303-0.50-001</p> <p>Package dimension unit: mm</p> <p style="text-align: center;">Bottom View</p>
--	---	--

<p style="text-align: center;">QFN16 P-WQFN16-0303-0.50-001</p> <p>Package dimension unit: mm</p> <p style="text-align: center;">Bottom View</p>	<p style="text-align: center;">QFN24 P-VQFN24-0404-0.50-004</p> <p>Package dimension unit: mm</p> <p style="text-align: center;">Bottom View</p>	<p style="text-align: center;">QFN24 P-WQFN24-0404-0.50-004</p> <p>Package dimension unit: mm</p> <p style="text-align: center;">Bottom View</p>
--	--	--

The drawing in the table above is a simplified version. Please check the target product data sheet for details of the package drawing.

<p>QFN32 P-VQFN32-0505-0.50-002</p>	<p>QFN32 P-VQFN32-0505-0.50-004</p>	<p>QFN32 P-VQFN32-0505-0.50-005</p>
<p>Package dimension unit : mm</p> <p>Bottom View</p>	<p>Package dimension unit : mm</p> <p>Bottom View</p>	<p>Package dimension unit : mm</p> <p>Bottom View</p>

<p>QFN32 P-VQFN32-0505-0.50-008</p>	<p>QFN36 P-VQFN36-0505-0.50-001</p>	<p>QFN36 P-VQFN36-0505-0.50-002</p>
<p>Package dimension unit : mm</p> <p>Bottom View</p>	<p>Package dimension unit : mm</p> <p>Bottom View</p>	<p>Package dimension unit : mm</p> <p>Bottom View</p>

<p>QFN36 P-WQFN36-0606-0.50-001</p>	<p>QFN36 P-WQFN36-0606-0.50-002</p>	<p>QFN40 P-WQFN40-0606-0.50-001</p>
<p>Package dimension unit : mm</p> <p>Bottom View</p>	<p>Package dimension unit : mm</p> <p>Bottom View</p>	<p>Package dimension unit : mm</p> <p>Bottom View</p>

The drawing in the table above is a simplified version. Please check the target product data sheet for details of the package drawing.

<p style="text-align: center;">QFN48 P-VQFN48-0707-0.50-004</p> <p>Package dimension unit : mm</p> <p style="text-align: center;">Bottom View</p>	<p style="text-align: center;">QFN48 P-WQFN48-0707-0.50-001</p> <p>Package dimension unit : mm</p> <p style="text-align: center;">Bottom View</p>	<p style="text-align: center;">QFN48 P-WQFN48-0707-0.50-003</p> <p>Package dimension unit : mm</p> <p style="text-align: center;">Bottom View</p>
---	---	---

<p style="text-align: center;">QFN48 QFN48-P-0707-0.50</p> <p>Package dimension unit : mm</p> <p style="text-align: center;">Bottom View</p>	<p style="text-align: center;">QON44 VQON44-P-0606-0.40</p> <p>Package dimension unit : mm</p> <p style="text-align: center;">Bottom View</p>	<p style="text-align: center;">SDIP24 SDIP24-P-300-1.78</p> <p>Package dimension unit : mm</p>
--	---	--

<p style="text-align: center;">SOL16 P-SOP16-0410-1.27-002</p> <p>Package dimension unit : mm</p>	<p style="text-align: center;">SOL18 P-SOP18-0812-1.27-001</p> <p>Package dimension unit : mm</p>	<p style="text-align: center;">SOP16 SOP16-P-225-1.27</p> <p>Package dimension unit : mm</p>
---	---	--

· The drawing in the table above is a simplified version. Please check the target product data sheet for details of the package drawing.

<p style="text-align: center;">SOP18 SOP18-P-375-1.27</p> <p>Package dimension unit : mm</p>	<p style="text-align: center;">SSOP16 SSOP16-P-225-0.65B</p> <p>Package dimension unit : mm</p>	<p style="text-align: center;">SSOP16 SSOP16-P-225-1.00A</p> <p>Package dimension unit : mm</p>
--	---	---

<p style="text-align: center;">SSOP18 SSOP18-P-225-0.65</p> <p>Package dimension unit : mm</p>	<p style="text-align: center;">SSOP20 SSOP20-P-225-0.65A</p> <p>Package dimension unit : mm</p>	<p style="text-align: center;">SSOP24 P-SSOP24-0613-1.00-001</p> <p>Package dimension unit : mm</p>
--	---	---

<p style="text-align: center;">SSOP24 SSOP24-P-300-0.65A</p> <p>Package dimension unit : mm</p>	<p style="text-align: center;">SSOP30 SSOP30-P-300-0.65</p> <p>Package dimension unit : mm</p>	<p style="text-align: center;">SSOP30 SSOP30-P-375-1.00</p> <p>Package dimension unit : mm</p>
---	--	--

The drawing in the table above is a simplified version. Please check the target product data sheet for details of the package drawing.

<p style="text-align: center;">SSOP8 P-HSOP8-0405-1.27-001</p> <p>Package dimension unit: mm</p>	<p style="text-align: center;">SSOP8 P-HSOP8-0405-1.27-002</p> <p>Package dimension unit: mm</p>	<p style="text-align: center;">PS-8 SON8-P-0303-0.655</p> <p>Package dimension unit: mm</p>
---	---	--

<p style="text-align: center;">TSSOP16 P-TSSOP16-0505-0.65-001</p> <p>Package dimension unit: mm</p>	<p style="text-align: center;">SSOP30 P-SSOP30-1120-1.00-001</p> <p>Package dimension unit: mm</p>	<p style="text-align: center;">HSSOP31 P-HSSOP31-0918-0.80-002</p> <p>Package dimension unit: mm</p>
---	---	---

<p style="text-align: center;">HDIP30 P-HDIP30-1233-1.78-001</p> <p>Package dimension unit: mm</p>

The drawing in the table above is a simplified version. Please check the target product data sheet for details of the package drawing.

RESTRICTIONS ON PRODUCT USE

Toshiba Corporation and its subsidiaries and affiliates are collectively referred to as "TOSHIBA". Hardware, software and systems described in this document are collectively referred to as "Product".

- TOSHIBA reserves the right to make changes to the information in this document and related Product without notice.
- This document and any information herein may not be reproduced without prior written permission from TOSHIBA. Even with TOSHIBA's written permission, reproduction is permissible only if reproduction is without alteration/omission.
- Though TOSHIBA works continually to improve Product's quality and reliability, Product can malfunction or fail. Customers are responsible for complying with safety standards and for providing adequate designs and safeguards for their hardware, software and systems which minimize risk and avoid situations in which a malfunction or failure of Product could cause loss of human life, bodily injury or damage to property, including data loss or corruption. Before customers use the Product, create designs including the Product, or incorporate the Product into their own applications, customers must also refer to and comply with (a) the latest versions of all relevant TOSHIBA information, including without limitation, this document, the specifications, the data sheets and application notes for Product and the precautions and conditions set forth in the "TOSHIBA Semiconductor Reliability Handbook" and (b) the instructions for the application with which the Product will be used with or for. Customers are solely responsible for all aspects of their own product design or applications, including but not limited to (a) determining the appropriateness of the use of this Product in such design or applications; (b) evaluating and determining the applicability of any information contained in this document, or in charts, diagrams, programs, algorithms, sample application circuits, or any other referenced documents; and (c) validating all operating parameters for such designs and applications. **TOSHIBA ASSUMES NO LIABILITY FOR CUSTOMERS' PRODUCT DESIGN OR APPLICATIONS.**
- **PRODUCT IS NEITHER INTENDED NOR WARRANTED FOR USE IN EQUIPMENTS OR SYSTEMS THAT REQUIRE EXTRAORDINARILY HIGH LEVELS OF QUALITY AND/OR RELIABILITY, AND/OR A MALFUNCTION OR FAILURE OF WHICH MAY CAUSE LOSS OF HUMAN LIFE, BODILY INJURY, SERIOUS PROPERTY DAMAGE AND/OR SERIOUS PUBLIC IMPACT ("UNINTENDED USE").** Except for specific applications as expressly stated in this document, Unintended Use includes, without limitation, equipment used in nuclear facilities, equipment used in the aerospace industry, lifesaving and/or life supporting medical equipment, equipment used for automobiles, trains, ships and other transportation, traffic signaling equipment, equipment used to control combustions or explosions, safety devices, elevators and escalators, and devices related to power plant. **IF YOU USE PRODUCT FOR UNINTENDED USE, TOSHIBA ASSUMES NO LIABILITY FOR PRODUCT.** For details, please contact your TOSHIBA sales representative or contact us via our website.
- Do not disassemble, analyze, reverse-engineer, alter, modify, translate or copy Product, whether in whole or in part.
- Product shall not be used for or incorporated into any products or systems whose manufacture, use, or sale is prohibited under any applicable laws or regulations.
- The information contained herein is presented only as guidance for Product use. No responsibility is assumed by TOSHIBA for any infringement of patents or any other intellectual property rights of third parties that may result from the use of Product. No license to any intellectual property right is granted by this document, whether express or implied, by estoppel or otherwise.
- **ABSENT A WRITTEN SIGNED AGREEMENT, EXCEPT AS PROVIDED IN THE RELEVANT TERMS AND CONDITIONS OF SALE FOR PRODUCT, AND TO THE MAXIMUM EXTENT ALLOWABLE BY LAW, TOSHIBA (1) ASSUMES NO LIABILITY WHATSOEVER, INCLUDING WITHOUT LIMITATION, INDIRECT, CONSEQUENTIAL, SPECIAL, OR INCIDENTAL DAMAGES OR LOSS, INCLUDING WITHOUT LIMITATION, LOSS OF PROFITS, LOSS OF OPPORTUNITIES, BUSINESS INTERRUPTION AND LOSS OF DATA, AND (2) DISCLAIMS ANY AND ALL EXPRESS OR IMPLIED WARRANTIES AND CONDITIONS RELATED TO SALE, USE OF PRODUCT, OR INFORMATION, INCLUDING WARRANTIES OR CONDITIONS OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, ACCURACY OF INFORMATION, OR NONINFRINGEMENT.**
- Do not use or otherwise make available Product or related software or technology for any military purposes, including without limitation, for the design, development, use, stockpiling or manufacturing of nuclear, chemical, or biological weapons or missile technology products (mass destruction weapons). Product and related software and technology may be controlled under the applicable export laws and regulations including, without limitation, the Japanese Foreign Exchange and Foreign Trade Law and the U.S. Export Administration Regulations. Export and re-export of Product or related software or technology are strictly prohibited except in compliance with all applicable export laws and regulations.
- Please contact your TOSHIBA sales representative for details as to environmental matters such as the RoHS compatibility of Product. Please use in compliance with all applicable laws and regulations that regulate the inclusion or use of controlled substances, including without limitation, the EU RoHS Directive. **TOSHIBA ASSUMES NO LIABILITY FOR DAMAGES OR LOSSES OCCURRING AS A RESULT OF NONCOMPLIANCE WITH APPLICABLE LAWS AND REGULATIONS.**

TOSHIBA

Toshiba Electronic Devices & Storage Corporation
Toshiba Electronic Device Solutions Corporation

<https://toshiba.semicon-storage.com/>