



SANYO Semiconductors

DATA SHEET

LB8655T — Monolithic Digital IC

Driver for Digital Still Cameras

Features

- Actuator driver for digital cameras embedded in one chip.
 - (1) Saturation output for AF - Stepping motor (1 phase, 2 phase and 1-2 phase excitation possible)
 - (2) Constant current control output for SH
- Quick charge and quick discharge circuitry allow the stabilization of response speeds.
- Input port 1 allows shutter close control.
- When shutter opening control, open-loop constant current control is possible.
 - (3) Saturation output for AE - voice coil motor drive
 - (4) ZOOM (lens barrel) - Constant voltage DC motor driver (Forward evolution/Reverse evolution/Brake)
Synchronous actuator driving with zoom is possible.
- No standby current consumption (or zero).
- 2 system power source (VB : for DC motor, V_{CC} : others)
- Low saturation output
- Built-in thermal protection circuitry
- Small, thin package

Specifications

Absolute Maximum Ratings at T_a = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum Power Source Voltage	VB max	VB	10.5	V
	V _{CC} max	V _{CC}	10.5	
Maximum Applied Input Voltage	V _{IN} max	MD1, 2, IN1, 2, INA, B, EN	10.5	V
Maximum Applied Output Voltage	V _{OUT} max	OUT1 to 6, A, B	10.5	V
Maximum Output Current 1	I _O max1	OUT1	400	mA
Maximum Output Current 2	I _O max2	OUT2 to 6	600	mA
Maximum Output Current 3	I _O max3	OUTA, B	800	mA
Allowable Power Dissipation	P _d max	Substrate mounting (*1)	800	mW
Operating Temperature	T _{opr}		-20 to +80	°C
Storage Temperature	T _{stg}		-55 to +150	°C

(*1) Mounting substrate : 76.1mm×114.3mm×1.6mm glass epoxy resin

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Allowable Operating Range at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Source Voltage Range	V_B	(*2)	2.0 to 10	V
	V_{CC}		2.0 to 10	
Input Pin High Level Voltage	V_{INH}	MD1, 2, IN1, 2, EN, INA, B	1.8 to 10	V
Input Pin Low Level Voltage	V_{INL}	MD1, 2, IN1, 2, EN, INA, B	-0.3 to 0.4	V
Constant Voltage Setting Input Range	VOC	VC	-0.1 to V_B	V

(*2) No restriction on priority among applied voltages of V_B (Battery power source),

V_{CC} (step-up power source) and V_{IN} (CPU power source).

Example1 : $V_B = 3.3\text{V}$, $V_{CC} = 4.0\text{V}$, $V_{IN} = 5.0\text{V}$

Example2 : $V_B = 3.3\text{V}$, $V_{IN} = 5.0\text{V}$

Electrical Characteristics at $T_a = 25^\circ\text{C}$, $V_B = V_{CC} = 3\text{V}$, $R_f = 1\Omega$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Standby Current Consumption	I_{CC0}	$V_B = V_{CC} = 8.0\text{V}$ MD1 to 3, IN1 to 4 = L		0.1	5.0	μA
V_{CC} Operating Current Consumption	I_{CC1}	AF mode IN1 = H (2 phase excitation)		24	32	mA
	I_{CC2}	AF mode IN1 = H (1 phase excitation)		14	21	
	I_{CC3}	SH mode IN1 = L		40	52	
	I_{CC4}	SH mode IN1 = H RILM = $2\text{k}\Omega$		16	20	
VB Operating Current Consumption	I_B	ZOOM mode INA = H		8	15	mA
Reference Voltage	V_{ref}	$I_{ref} = -500\mu\text{A}$	1.74	1.8	1.86	V
Reference Voltage start-up time	T_r	Design guaranteed		0.5	2.0	μs
Input Pin Current	I_{IN}	$V_{IN} = 5.0\text{V}$		70	90	μA
Overheat Protection Operation Temperature	THD	Design guaranteed (*3)	160	180	200	$^\circ\text{C}$
[Stepping motor driver for AF] (OUT2 to 3, OUT5 to 6)						
Output Saturation Voltage 1	VSAT1	$V_{CC} = 3.3\text{V}$, $I_O = 0.2\text{A}$ (upper and lower)	0.15	0.25	0.40	V
[AE driver] (OUT4 to 5)						
Output Saturation Voltage 2	VSAT2	$V_{CC} = 3.3\text{V}$, $I_O = 0.2\text{A}$ (upper and lower)	0.15	0.25	0.40	V
[SH driver] (OUT1 to 2)						
Output Constant Current 1	I_{O1}	OUT2→OUT1 $V_{CC} = 3.0$ to 3.7V , $R_f = 0.53\text{k}\Omega$	203	215	227	mA
Output Constant Current 2	I_{O2}	OUT1→OUT2 $V_{CC} = 4.2\text{V}$ RILM = $1.6\text{k}\Omega$	162	180	198	
Output Saturation Voltage 3	VSAT3	$V_{CC} = 3.3\text{V}$, $I_O = 0.2\text{A}$ (upper and lower)	0.2	0.3	0.45	V
[DC motor driver for ZOOM] (OUTA to B)						
Output Constant Voltage	V_O	$V_B = 3.0$ to 3.7V , $V_C = 0.5\text{V}$	2.41	2.53	2.65	V
Output Saturation Voltage 4	VSAT4	$V_B = 3.3\text{V}$, $I_O = 0.3\text{A}$ (upper and lower)	0.20	0.35	0.45	V
Output Saturation Voltage 5	VSAT5	$V_B = 3.3\text{V}$, $I_O = 0.3\text{A}$ (upper)	0.1	0.15	0.25	V

(*3) For the characteristic within the guaranteed temperature range, shipping check is performed at $T_a = 25^\circ\text{C}$.

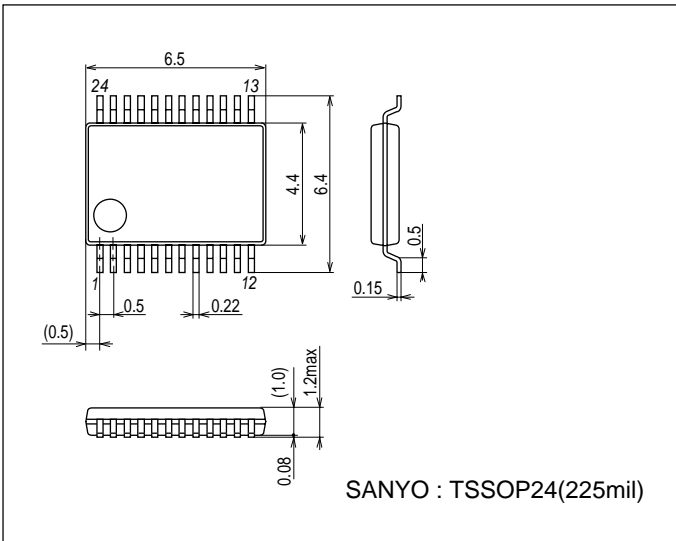
For all temperature range, it is design guaranteed.

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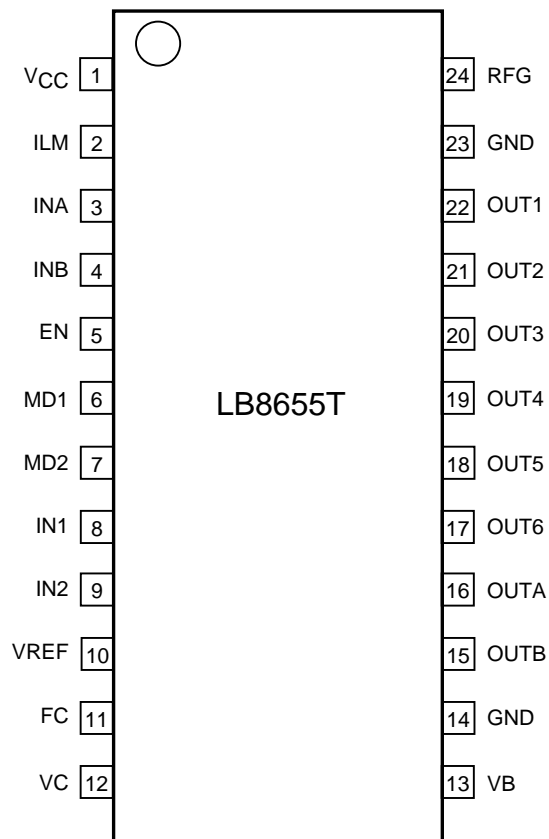
Package Dimensions

unit : mm (typ)

3260A



Pin Assignment



Top view

(Note) Both 2 pins are connected to GND pin.

True Value Table

(1) DC motor constant voltage control for ZOOM

Input		Output		VREF	Mode
INA	INB	OUTA	OUTB		
L	L	-	-	-	Standby
H	L	H	L	ON	Forward evolution
L	H	L	H		Reverse rotation
H	H	L	L		Brake

(*): Don't care.

(-): Output OFF

H: Constant voltage output is 5 times the VC pin applied voltage.

(2) AF/SH/AE constant current control

Input					Output						VREF	Mode	
EN	MD1	MD2	IN1	IN2	OUT1	OUT2	OUT3	OUT4	OUT5	OUT6			
L	L	L	L	L	-	-	-	-	-	-	-	Standby (0μA)	
L	*	*	*	*	-	-	-	-	-	-	-	Output interruption	
H	L	L	L	*	L	H	-	-	-	-	ON	SH	
			H	*	H	L	-	-	-	-			
H	H	L	L	L	-	-	-	-	-	-		AE (VCM)	
			H	L	-	-	-	H	L	-			
			L	H	-	-	-	L	H	-			
H	H	-	-	-	-	-	-						
H	L	H	L	L	-	-	-	-	H	L			AF (1-phase excitation)
			H	L	-	H	L	-	-	-			
			H	H	-	-	-	-	L	H			
L	H	-	L	H	-	-	-						
H	H	H	L	L	-	L	H	-	H	L		AF (2-phase excitation)	
			H	L	-	H	L	-	H	L			
			H	H	-	H	L	-	L	H			
			L	H	-	L	H	-	L	H			

(*): Don't care.

(-): Output OFF

L: Constant current output

Note: When the current flows from OUT1 to OUT2, easy constant current output function is ON.

The output current is controlled by the resistance value connected between the ILM pin and GND.

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