

CS8803

3-Channel Constant-Current RGB LED Driver IC

■ **Product Description**

CS8803 is a 3-channel constant-current RGB LED driver IC, which is designed for LED lighting or display applications. At CS8803 output channel, 3-channel constant current value set is adjustable with three corresponding external resistors to match RGB color characteristics. CS8803 built in a voltage regulator, which provides supply voltage range from 6.0V to 12V, maintains constant current from 5mA to 60mA. Control signal (ENBO, LTO), data (SDO) and clock (CKO) buffer outputs are designed for cascading another chip. In addition, CS8803 guarantees to stand maximum 24V at the output channel.

■ **Features**

- 3 constant current channels for RGB each
- Maximum output current capability: 60mA each channel
- Range of constant current for every channel: 5mA ~ 60mA
- Built-in buffers for cascading control signal (ENBO, LTO), data (SDO) and clock (CKO) to next driver IC
- Built-in voltage regulator working with supply voltage ranging from 6V ~ 12V
- Output current accuracy:
 - Between channels: < +/- 6% (max.), and
 - Between ICs : < +/- 6% (max.)
- Maximum output drain voltage: 24V
- For common anode LED application
- CMOS/TTL compatible input

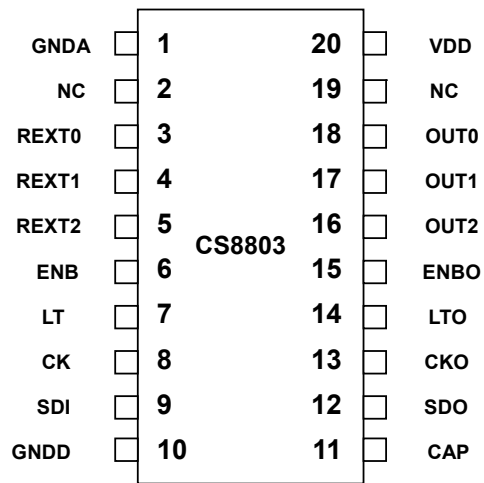
■ **Applications**

- LED decorative lighting
- Indoor/Outdoor LED video or message display
- Landscape lighting
- Neon lamp alternative

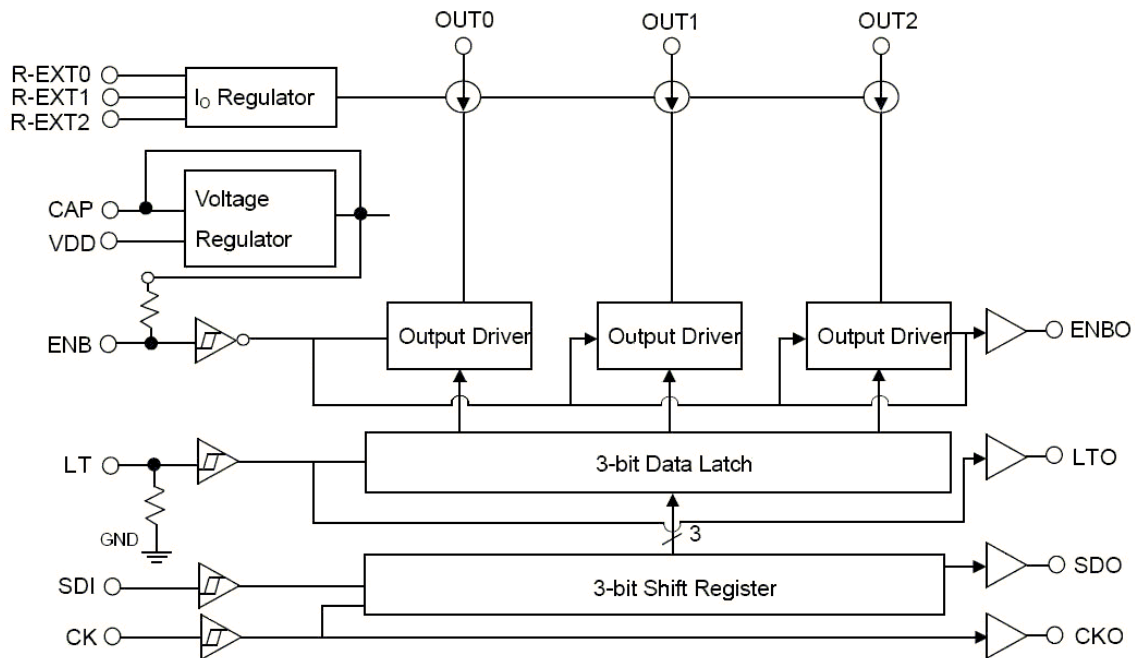
■ **Product Family**

CS8803BT ----- 20SSOP-150mil

■ Pin Assignment



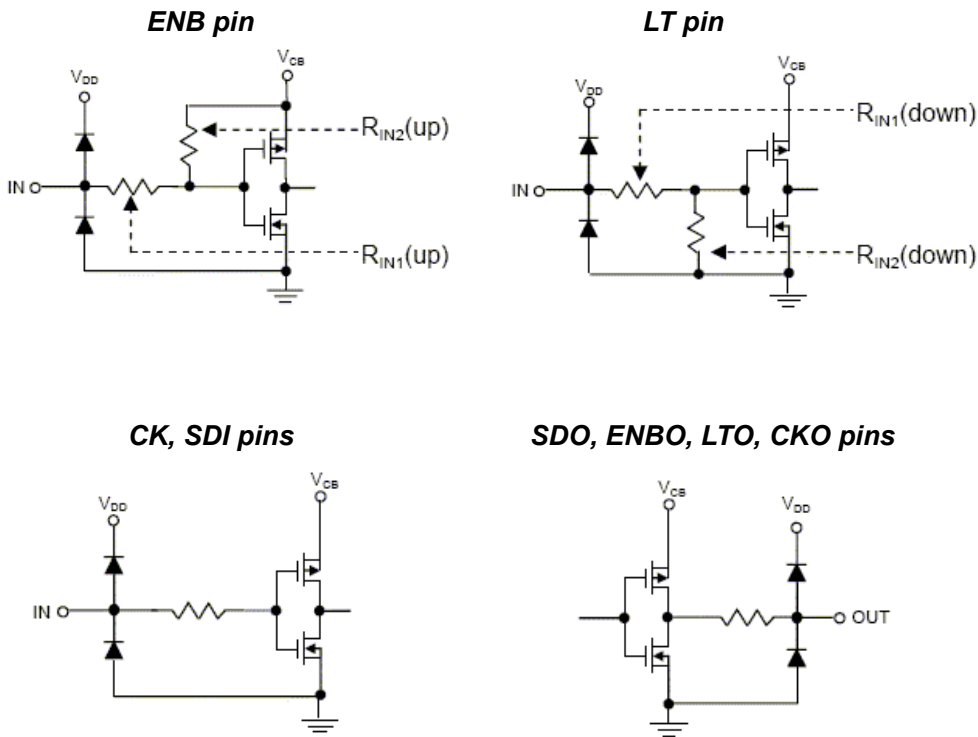
■ Block Diagram



■ Pin Description

Pin No.	Pin Name	Function
1	GNDA	Analog ground
2	NC	No used
3~5	REXT0~REXT2	Input terminal used to connect an external resistor for setting up output current for all output channels
6	ENB	Output enable input terminal When ENB is active (low), the output ports are enabled; when ENB is inactive (high), all output ports are turned off (blanked)
7	LT	Data strobe input terminal The data in shift register is transferred to the data latch when LT is high. The data is latched when LT goes low
8	CK	Clock input terminal for data shift on rising edge
9	SDI	Serial data input terminal to the shift register
10	GNDD	Digital ground
11	CAP	Connected to a compensated capacitor for the regulator output
12	SDO	Serial data output terminal to be connected to the SDI of the next driver IC. SDO signal changes on falling edge of CK
13	CKO	Clock output terminal, CK replica, connected to the next CK
14	LTO	LT output terminal, LT replica, connected to the next LT
15	ENBO	ENB output terminal, ENB replica, connected to the next ENB
16~18	OUT2~OUT0	Constant current output terminal
19	NC	No used
20	VDD	Supply voltage terminal

■ Equivalent Circuits of I/O pins

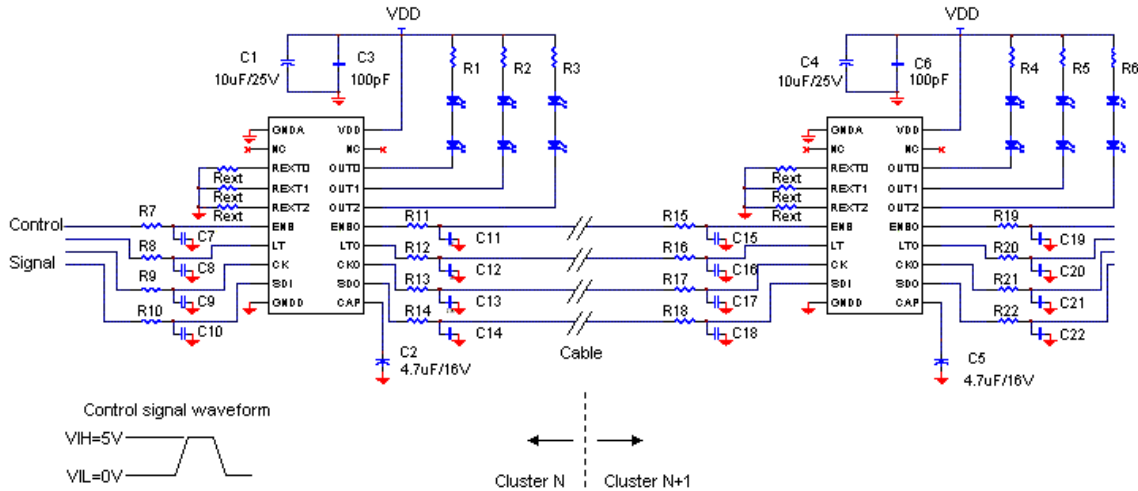


■ Maximum Ratings

Characteristic	Symbol	Rating	Unit
Supply Voltage	V_{DD}	+15	V
Input Voltage	V_{IN}	-0.4~ V_{DD} +0.4	V
Output Current per Output Channel	I_{OUT}	+60	mA
Sustaining Voltage at OUT port	V_{DS}	24.0	V
GND Terminal Current	I_{GND}	1000	mA
Power Dissipation at 25°C	P_D	1.2	W
Thermal Resistance	$R_{th(j-a)}$	73.43	°C/W
Operating Junction Temperature	$T_{j,max}$	150	°C
Operating Temperature	T_{opr}	-40~+85	°C
Storage Temperature	T_{stg}	-55~+150	°C

Application Information

Application Circuit



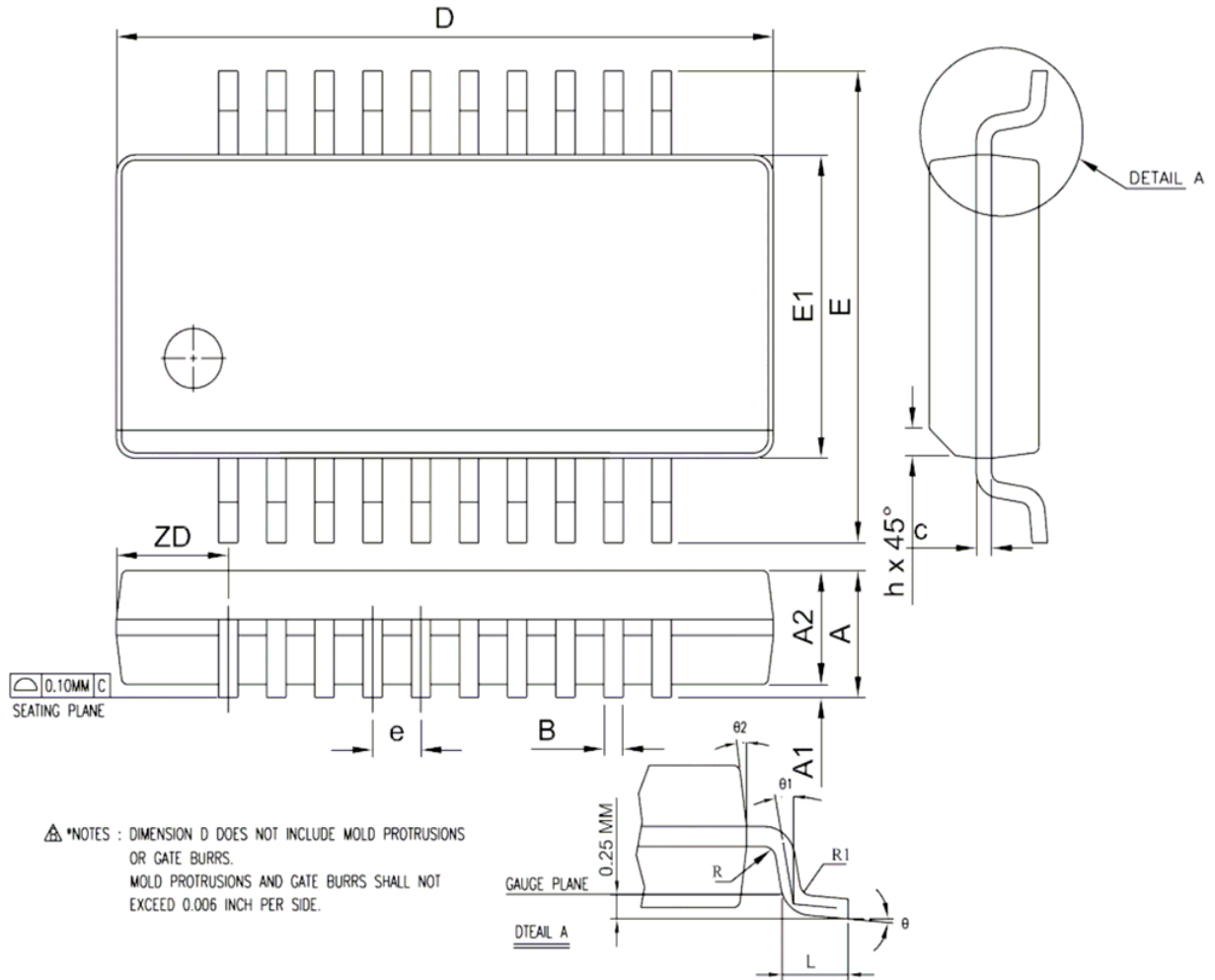
Note

1. When the R_{ext} is 590Ω , the I_{OUT} is 20mA.
2. C1~C6 are required. The values of the C1/C4 and C3/C6 are for reference only. The value of C2/C5 ranges from $4.7\mu F/16V$ to $10\mu F/16V$. Tantalum capacitors or capacitors with $ESR < 2\Omega$ are recommended.
3. C7~C22 and R7~R22 can modify the signal waveforms.

Order information

Part No.	Package Type	Lead Pitch
CS8803BT	20SSOP(150mil)	0.64 mm

PACKAGE DIMENSIONS - 20L SSOP - 150mil



SYMBOL		A	A1	A2	B	c	e	D	E	E1	L	h	ZD	R1	R	θ	θ_1	θ_2		
UNIT																				
MM	MIn.	1.35	0.10	-	0.20	0.18	0.635 BASIC	8.56	5.79	3.81	0.41	0.25	1.4732 REF.	0.20	0.20	0°	0°	5°		
	Nom.	1.63	0.15	-	-	-		8.66	5.99	3.91	0.635	-		-	-	-	-	-	-	10°
	Max.	1.75	0.25	1.50	0.30	0.25		8.74	6.20	3.99	1.27	0.50		-	0.33	-	8°	-	-	15°