TM1814 IC Datasheet

1. Description

TM1814 is a 4-channel LED driver control IC. Internal integrated with MCU digital interface, data flip-latch, LED high voltage driver and so on .Through the external MCU control, the chip can achieve separate luminance, and through cascade control can achieve outdoor large-screen color dot-matrix light-emitting control. TM1814 have excellent performance and high reliability.

2. Feature

Use high-voltage power CMOS process

Output pin tolerance voltage is up to 32V

Input voltage can support 6 ~24V via outside resistance connected to chip VDD pin

Build-in stabilized voltage supply circuit 64 level current adjustable(6.5mA-38mA)

Brightness adjustment circuit(256 level)

Signal line for series cascade interface

Oscillation mode: Built-in double RC oscillator and clock synchronization

Built-in power-on reset circuit

PWM control side can achieve 256 adjustment, scan frequency not less than 400hz / s

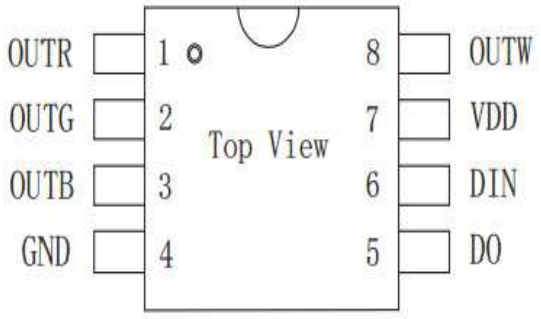
Data transmission speed have two selected mode (500Kbps and 800Kbps)

External control model:800KHZ

Internal control model:500KHZ

SOP8

3. PIN Configuration



4. PIN define

PIN Name	NO.	I/O	Function
DIN	6	I	DATA INUT
DO	5	O	DATA OUTPUT
VDD	7	--	Power
OUTR	1	O	Constant current output
OUTG	2	O	Constant current output
OUTB	3	O	Constant current output
OUTW	8	O	Constant current output
GND	4	--	Power and signal GND

5. Electrical parameters

Limited parameter（Ta = 25℃, Vss = 0 V）

Parameter	Symbol	Range	Unit
Logic power supply voltage	VDD	-0.4 ～+7.0	V
Output tolerance voltage	VOUTx	32	V
Logic input voltage	VI1	-0.4 ～ VDD + 0.7	V
LED driver output current	IO1	80	mA
Power Dissipation	PD	400	mW
Operating Temperature	Topt	-40 ～ +80	℃
Storage Temperature	Tstg	-65 ～+150	℃

Electrical characteristics（Ta = -20 ～ +70℃， VDD = 4.5 ～ 5.5 V， Vss = 0 V

		TM1814			unit
symbol	test condition	min	typ	max	
Voh	Ioh=3mA	VDD-0.5			V
Vol	Iol=10mA			0.4	V
Vih	VDD=5.0V	3.5		VDD	V
Vil	VDD=5.0V	0		1.5	V
Ioh	VDD=5.0V，Vdo=4.9V		1		mA
Iol	VDD=5.0V，Vdo=0.4V		10		mA
Iin	DIN 接 VDD		1		μA
IDD	VDD=4.0V，GND=0V，其他端口悬空	0.5	2.8	3.5	mA
Iout	OUTRW, OUTR, OUTG, OUTB=ON，Vout=3.0V	6.5		38	mA
Iolkg	OUTRW, OUTR, OUTG, OUTB=OFF，Vout=12.0V			0.5	μA
ΔIolc0	OUTRW, OUTR, OUTG, OUTB=ON，Vout=3.0V			±3	%
ΔIolc1	OUTRW, OUTR, OUTG, OUTB=ON，Vout=3.0V			±5	%
Pd	Ta=25℃			250	mW

Switching characteristics（Ta = -20 ～ +70℃， VDD = 4.5 ～ 5.5 V）

		TM1814			unit
symbol	test condition	min	tpy	max	
Fin			800		KHz
Fout	out R,out G,out B,out W	900	1000	1100	Hz
Tos	DIN without data input	450	500	550	ms
Tplz	DIN → DO		178		ns
Ci				15	pF

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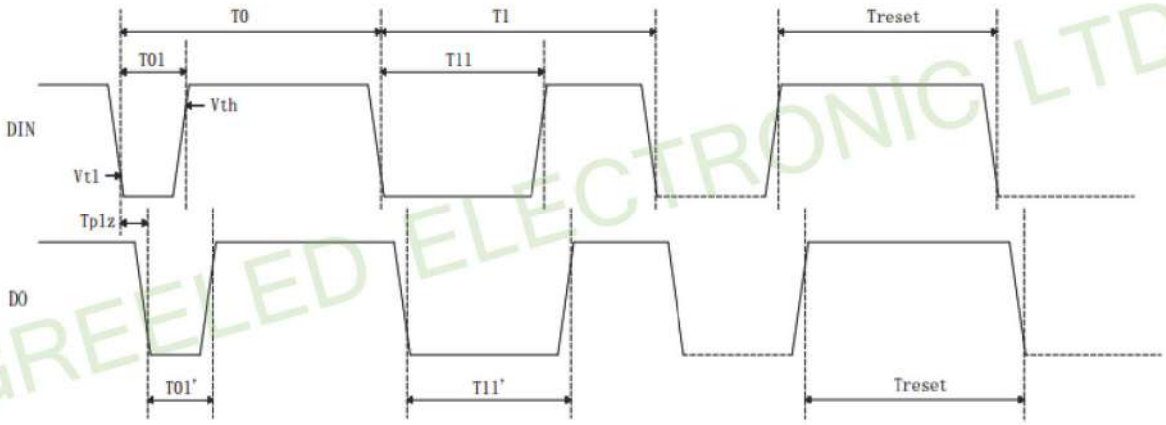
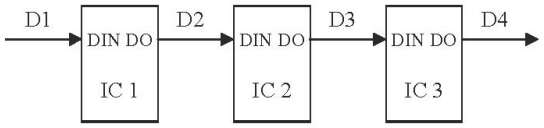
Timing

T0LI	Input 0 code ,low voltage time	360ns	±50ns
T1LI	Input 1 code ,low voltage time	720ns	±50ns
T0LO	Output 0 code , low voltage time	350ns	
T1LO	Output 1 code ,low voltage time	700ns	
RES	High voltage time	200-20000μs	

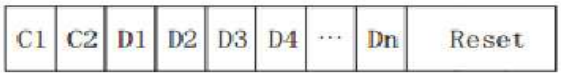
0 code or 1 code circle (T0/T1)=1.25us



Connection mode



Data transmission method :

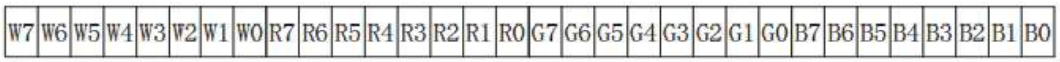


1 Frame data

C1,C2 is command for setting constant current,each chip can resent and receive

D1,D2....Dn is PWM data

Reset code: High voltage is valid



C1 data format

the high bit sent at first. W7,W6,R7,R6,G7,G6,B7,B6=0

W5--W0 for set OUTW current, all 0 code I= 6.8mA, all 1 code,I=38mA. Total 64 level

R5--R0 for set OUTR current, all 0 code I= 6.8mA, all 1 code,I=38mA. Total 64 level

G5--G0 for set OUTG current, all 0 code I= 6.8mA, all 1 code,I=38mA. Total 64 level

B5--B0 for set OUTB current, all 0 code I= 6.8mA, all 1 code,I=38mA. Total 64 level

C2 Data format

Note: C2 relative bit is opposite with C1 relative bit

Dn data format

the high bit sent at first.