

BRIGHT LED ELECTRONICS CORP.

LED DISPLAY SPECIFICATION

●COMMODITY : 0.54"(13.80mm) Driver IC DUAL DIGIT LED DISPLAY

PAGE: 1

●DEVICE NUMBER : BD-E522RI-DR1

VERSION : 1.2 / 2002.05.23

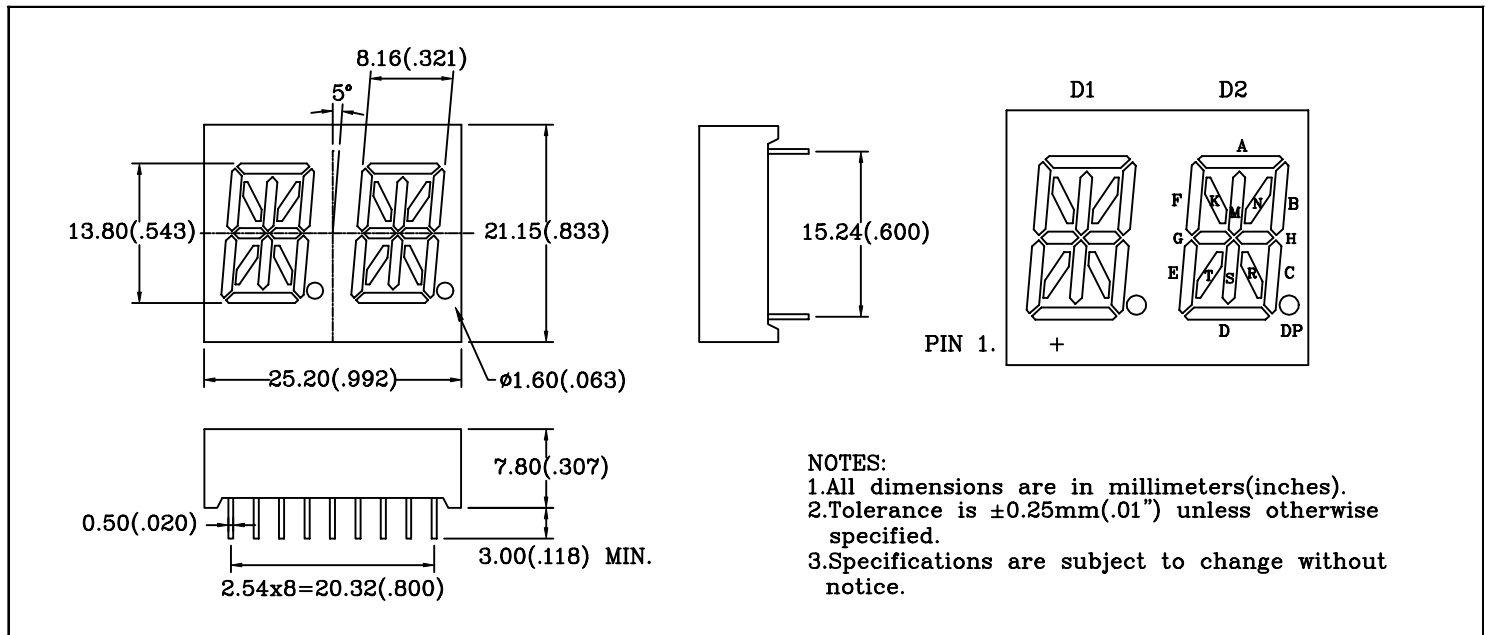
●ELECTRICAL AND OPTICAL CHARACTERISTICS (Ta=25°C)

Chip		Absolute Maximum Rating				Electro-optical Data (At 10mA)			Surface Color	Segment Color
Emitted Color	Peak Wave Length λ P(nm)	$\Delta \lambda$ (nm)	Pd (mW)	If (mA)	Peak If(mA)	Vf(V)		Iv Typ. (mcd)		
						Typ.	Max.			
Green	568	30	100	30	150	2.1	2.5	3.5	Gray	White

●ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

Reverse Voltage	5V
Reverse Current (Vr=5V)	50 μ A
Operating Temperature Range	-40°C ~ 80°C
Storage Temperature Range	-40°C ~ 85°C
Lead Soldering Temperature (1/16" From Body).....	260°C For 5 Seconds

●PACKAGE DIMENSIONS:



●Pin Connection

Pin No.	Description	Pin No.	Description
1	Bit 32 Output	10	No Pin
2	Bit 33 Output	11	No Pin
3	Bit 34 Output	12	No Pin
4	Data Input	13	Vss *1
5	Clock Input	14	Vss *1
6	Data Enable	15	Bit 29 Output
7	V _{DD}	16	Bit 30 Output
8	V _{LED}	17	Bit 31 Output
9	Brightness Control	18	No Pin

Note: Pin no 13 & 14 are internally connected.

RELEASED:



ENGINEER:



BRIGHT LED ELECTRONICS CORP.

35-BIT LED DISPLAY DRIVER

● DEVICE NUMBER: BD-E522RI-DR1

PAGE: 2

● Table I Serial Data Input Sequence

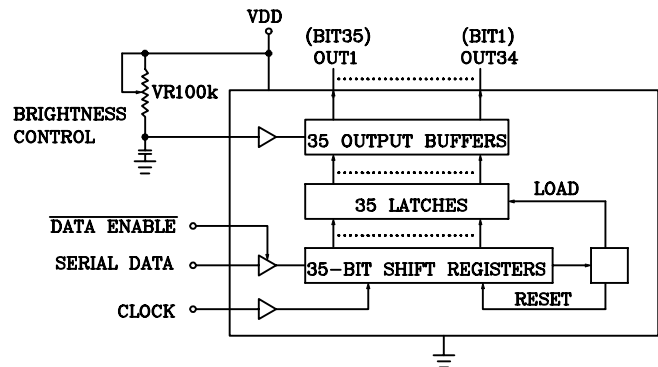
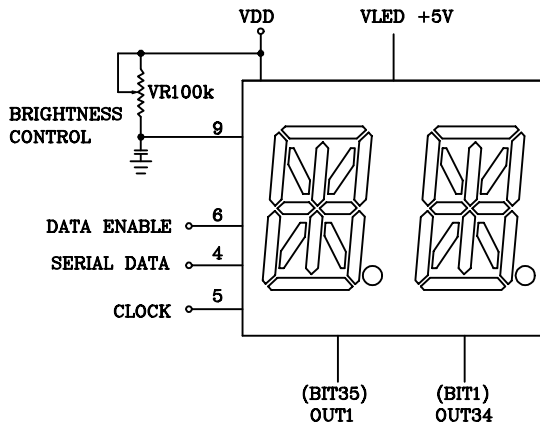
Bit	Digit	Segment	Bit	Digit	Segment
1	2	A	18	1	D
2	2	B	19	1	E
3	2	C	20	1	F
4	2	D	21	1	G
5	2	E	22	1	H
6	2	F	23	1	K
7	2	G	24	1	M
8	2	H	25	1	N
9	2	K	26	1	R
10	2	M	27	1	S
11	2	N	28	1	T
12	2	R	29	1	DP
13	2	S	30	2	DP
14	2	T	31		Pin17
15	1	A	32		Pin1
16	1	B	33		Pin2
17	1	C	34		Pin3

● FEATURES

- * CMOS TECHNOLOGY
- * CONTINUOUS BRIGHTNESS CONTROL
- * SERIAL DATA INPUT
- * NO LOAD SIGNAL REQUIRED
- * OPTIONAL EXTERNAL DATA ENABLE AND RESET
- * WIDE POWER SUPPLY OPERATION (3.5V TO 10V)
- * TTL COMPATIBILITY
- * 34 OR 35 OUTPUTS, 20mA SINK CAPABILITY
- * ALPHANUMERIC CAPABILITY

Pad Name	Description
V _{DD}	Power
V _{SS}	Ground
Reset	Reset Signal Input, (Normally Lo; Active Hi)
Brightness Control	Dc Current Input For LED Brightness Control
Clock Input	Clock Input
Data Input	Serial Data Input
Data Enable	Data Input Enable, (Normally Lo; Active Lo)
Out1~Out35	Nmos Output Drivers

● BLOCK DIAGRAM



BRIGHT LED ELECTRONICS CORP.

35-BIT LED DISPLAY DRIVER

PAGE: 3

- DEVICE NUMBER: BD-E522RI-DR1
- FUNCTIONAL DESCRIPTION

1. DATA IS TRANSFERRED SERIALLY VIA 2 SIGNALS: CLOCK AND SERIAL DATA. DATA TRANSFER WITHOUT THE ADDED INCONVENIENCE OF AN EXTERNAL LOAD SIGNAL IS ACCOMPLISHED BY USING A FORMAT OF A LEADING "1" FOLLOWED BY THE ALLOWED 35 DATA BITS. THESE 35 DATA BITS ARE LATCHED AFTER THE 36TH HAS BEEN TRANSFERRED. THIS SCHEME PROVIDES NON-MULTIPLEXED, DIRECT DRIVE TO THE LED DISPLAY. CHARACTERS CURRENTLY DISPLAYED (THUS, DATA OUTPUT) CHANGES ONLY IF THE SERIAL DATA BITS DIFFER FROM THOSE PREVIOUSLY TRANSFERRED.

2. DISPLAY BRIGHTNESS IS DETERMINED BY CONTROL OF THE OUTPUT CURRENT FOR LED DISPLAYS. THIS CONTROL FUNCTION CAN BE ACHIEVED BY VARYING THE CURRENT INTO B.C. TERMINAL. A SIMPLE WAY IS TO SET AN EXTERNAL VARIABLE RESISTOR ILLUSTRATED IN THE BLOCK DIAGRAM. TYPICALLY, THE OUTPUT CURRENT IS 36 TIMES GREATER THAN CURRENT INTO B.C. TERMINAL.

3. FIGURE 1 SHOWS THE INPUT DATA FORMAT. A LEADING "1" IS FOLLOWED BY 35 BITS OF DATA. AFTER THE 36TH HAS BEEN TRANSFERRED, A LOAD SIGNAL IS GENERATED SYNCHRONOUSLY WITH THE CLOCK HIGH STATE. THIS LOADS THE 35 BITS OF DATA INTO THE LATCHES. [A RESET SIGNAL IS GENERATED CONSECUTIVELY WITH THE CLOCK LOW WHICH CLEARS ALL SHIFT REGISTERS FOR THE NEXT SET OF DATA] ALL SHIFT REGISTERS ARE STATIC MASTER-SLAVE, WITH NO CLEAR FOR THE MASTER PORTION OF THE FIRST REGISTER, ALL OWING CONTINUOUS OPERATION [THERE MUST BE A COMPLETE OF 36 CLOCKS OR THE SHIFT REGISTERS WILL NOT CLEAR.]

4. WHEN THE CHIP FIRST POWERS ON AN INTERNAL POWER ON RESET SIGNAL IS GENERATED WHICH RESETS ALL SHIFT REGISTERS AND ALL LATCHES. THE START BIT AND THE FIRST CLOCK RETURN THE CHIP TO ITS NORMAL OPERATION.

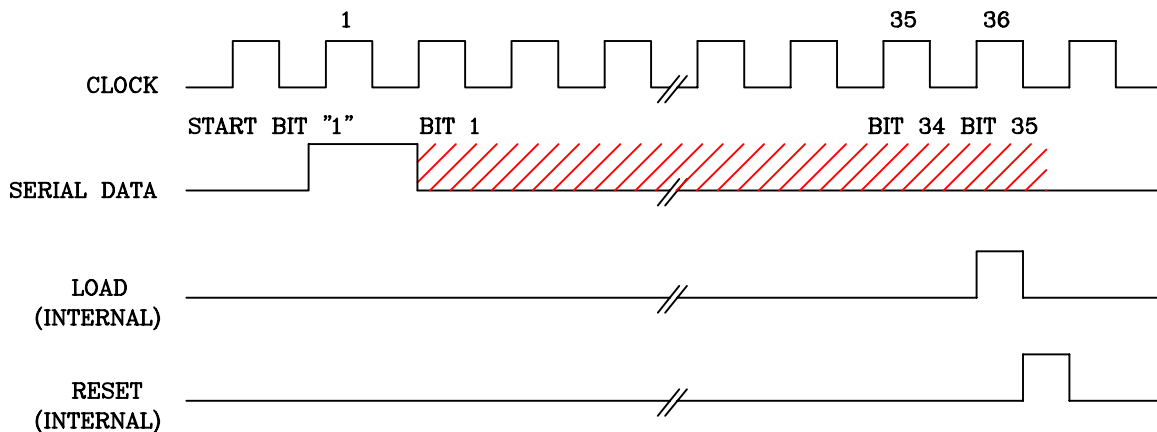


FIG.1 INPUT DATA FORMAT

BRIGHT LED ELECTRONICS CORP.

35-BIT LED DISPLAY DRIVER

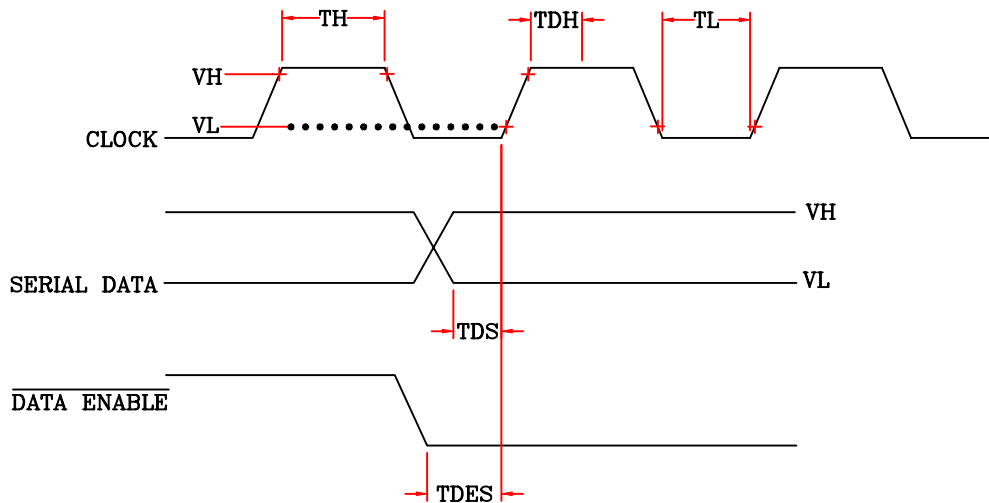
● DEVICE NUMBER: BD-E522RI-DR1

PAGE: 4

● ABSOLUTE MAXIMUM RATINGS, $T_a=25^{\circ}\text{C}$ (UNLESS OTHERWISE SPECIFIED)

CHARACTERISTICS	SYMBOL	RATING	UNIT
SUPPLY VOLTAGE	V_{DD}	+3.5~+10	V
LED SUPPLY VOLTAGE	V_{LED}	5 ± 0.5	V
CLOCK FREQUENCY	F_{osc}	500K	Hz
INPUT VOLTAGE	V_{IN}	-0.3~ $V_{DD}+0.3$	V
INPUT B.C. CURRENT	I_{BC}	550	μA
OUTPUT SUSTAINING VOLTAGE	V_{DS}	12	V
OUT CONTINUOUS CURRENT	I_{OUT}	20	mA

● TIMING CHART & TIMING CONDITIONS



$V_{DD}=+5\text{V}$, $T_a=25^{\circ}\text{C}$, UNLESS OTHERWISE SPECIFIED

ITEM	DESCRIPTION	MIN	TYP	MAX	UNIT
T_H	CLOCK INPUT HIGH TIME	950	-	-	nS
T_L	CLOCK INPUT LOW TIME	950	-	-	nS
T_{DS}	SERIAL DATA SET-UP TIME	300	-	-	nS
T_{DH}	SERIAL DATA HOLD TIME	300	-	-	nS
T_{DES}	DATA ENABLE SET-UP TIME	100	-	-	nS

BRIGHT LED ELECTRONICS CORP.

TYPICAL CHARACTERISTICS

DEVICE NUMBER: BD-E522RI-DR1

SPECTRAL DISTRIBUTION

