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| SB6543 | P.1 |
| DUAL VOLTAGE HIGH BRIGHTNESS EL DRIVER IC | |

GENERAL DESCRIPTION

The SB6543 is specially designed as a dual voltage high brightness Electroluminescent Lamp Driver IC. Built-in RC OSC, transistors and only requires 4~5 external components. It is capable of supplying up to 250V_{pp} signals with 1μA low standby current. Separate voltage supply for Driver IC and the Electroluminescent Lamp to attain maximum brightness.

FEATURE

- * BIPOLAR TECHNOLOGY
- * DUAL OPERATING VOLTAGE :
3.0V ~ 5.0V DC
3.0V – 12.0V DC
- * TOTAL SUPPLY CURRENT:
100mA (at V_{dd1}=5.0V, V_{dd2}=8.0V)
- * Built-in RC OSC & TRANSISTORS
- * EL FREQUENCY more suitable for BLUE Electroluminescent Lamp
- * Low Current Standby Mode

APPLICATIONS

- * PDA BACKLIGHT
- * HANDHELD COMPUTER LCD BACKLIGHT
- * LCD DISPLAY PANEL FOR INSTRUMENTATION APPARATUS

ABSOLUTE MAXIMUM RATINGS

Exposure to absolute maximum rating conditions for extended periods of time may affect reliability.

| | |
|-------------------------|-----------------------------------|
| V _{dd1} | 7.0V |
| V _{dd2} | 12.0V |
| Input Voltages/Current | |
| HON (pin 1) | -0.5V to (V _{dd} + 0.5V) |
| COIL (pin 3) | 300mA |
| Lamp Outputs | 250 V _{pp} |
| Power Dissipation | 500mW |

SB6543**P.2****DUAL VOLTAGE
HIGH BRIGHTNESS
EL DRIVER IC**

SPECIFICATION

(T=25°C, V_{dd1}=5.0V, V_{dd2}=8.0V Lamp Capacitance=30nF, Coil=680 μf (R=5.5 ohms),

C_{osc}=150pF, unless otherwise noted)

| PARAMETER | MIN | TYP | MAX | UNIT | CONDITIONS |
|----------------------------------|-----------------------|-----|---------------------|------|----------------------------------------------------------------------------|
| Supply Voltage, V _{dd1} | 3.0 | - | 5.0 | V | |
| Supply Voltage, V _{dd2} | 3.0 | - | 12.0 | V | |
| Total Supply Current | - | - | 100 | mA | H _{ON} =5.0V V _{dd1} =5.0V; V _{dd2} =8.0V |
| Quiescent Supply Current | - | 100 | 1000 | nA | H _{ON} =0V V _{dd1} =5.0V; V _{dd2} =12.0V |
| Hon Voltage, On | V _{dd1} -0.5 | - | V _{dd1} | V | |
| Hon Current, On | - | 15 | 60 | μA | |
| Hon Voltage, Off | - | - | V _{dd1} -4 | V | V _{dd1} =5.0V; |

INDUCTOR DRIVE

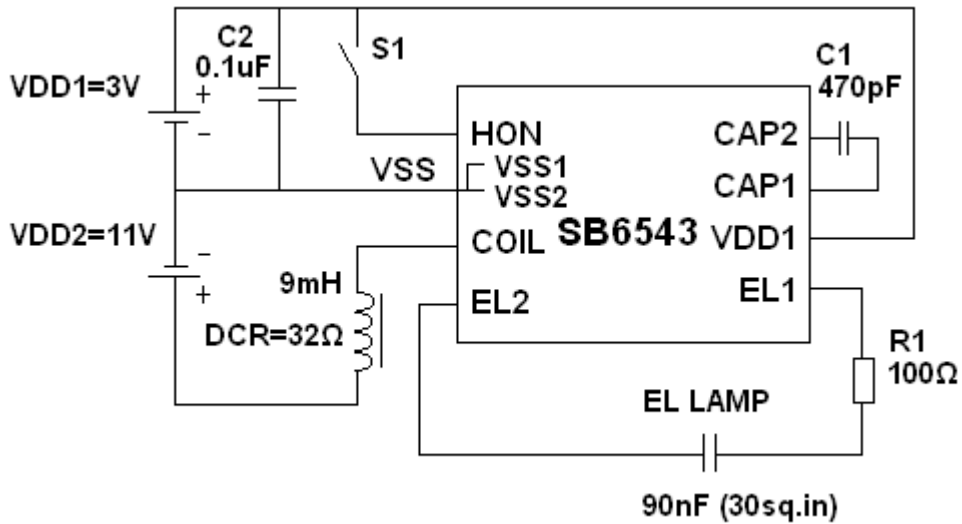
| | | | | | |
|--------------------------------------------|---|----|-----|----|--|
| Peak Coil Current, I _{pk-coil} | - | - | 300 | mA | |
| Coil Duty Cycle | | 75 | | % | |

EL LAMP OUTPUT

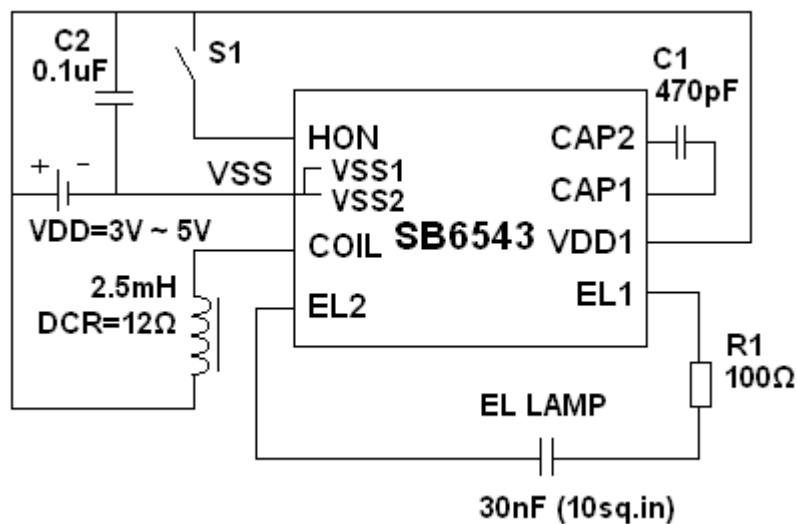
| | | | | | |
|--------------------------------------|-----|-----|-----|-----------------|---------------------------------------------------|
| EL Lamp Frequency, f _{lamp} | 200 | 400 | 600 | Hz | V _{dd1} =5.0V; V _{dd2} =8.0V |
| Peak to Peak Output Voltage | 110 | 160 | - | V _{pp} | V _{dd1} =5.0V; V _{dd2} =8.0V |

APPLICATION CIRCUIT

1. LARGER SIZE EL LAMP (30sq. in EL Lamp)



2. SMALLER SIZE EL LAMP (10sq. in EL Lamp)

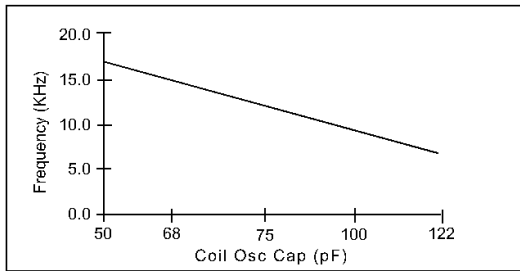


SB6543

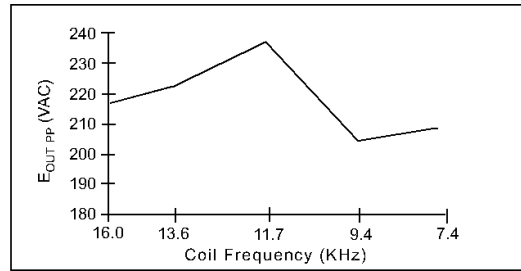
NOTES

1. Larger inductance values may be required depending upon supply impedance.
2. Electrolytic capacitor 10uF~47uF is connected across HON & VSS for delay function.
3. S1 is connected to VDD1 to enable.

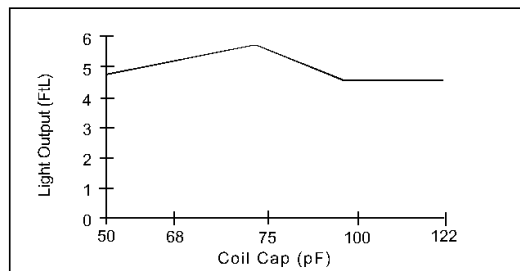
The following performance curves are intended to give the designer a relative scale from which to optimize specific applications. Absolute measurements may vary depending upon the brand of components chosen.



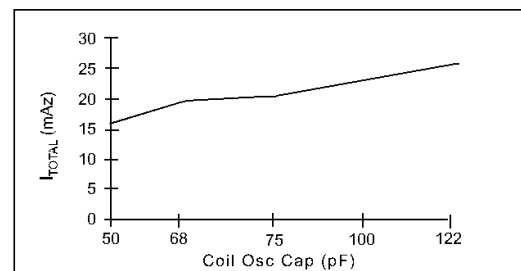
Coil Frequency vs. Coil Osc Cap Value



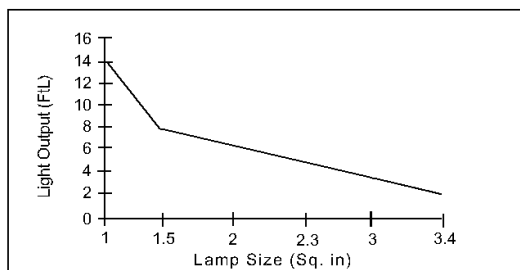
Coil Frequency vs. E_{OUT_PP}



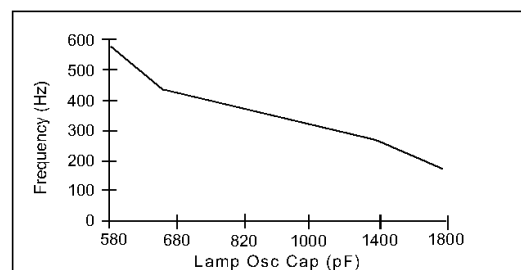
Coil Cap vs. Light Output



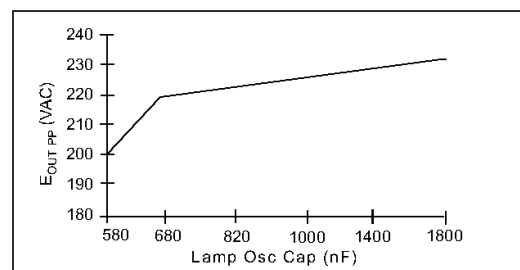
I_{TOTAL} vs. Coil Osc Cap



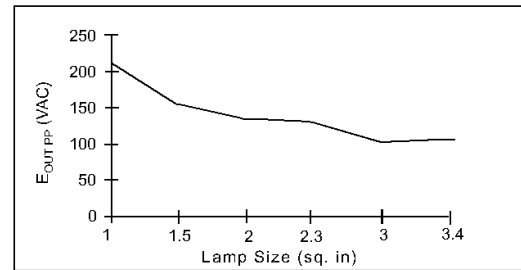
Lamp Size vs. Light Output



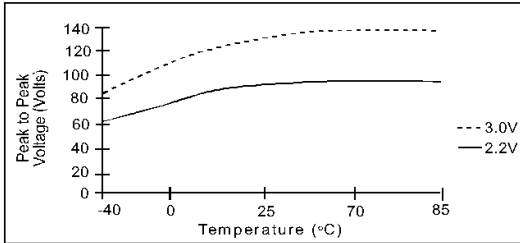
Lamp Frequency vs. Lamp Osc Cap Value



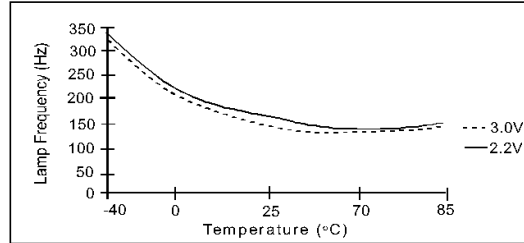
Lamp Osc Cap vs. E_{OUT_PP}



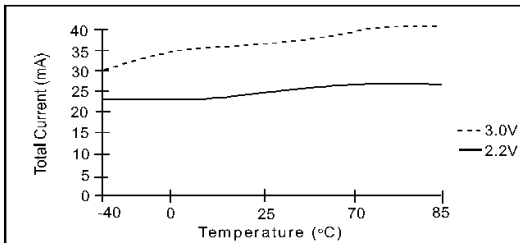
Lamp Size vs. E_{OUT_PP}

SB6543**P.5****LOW FREQUENCY
EL DRIVER IC**

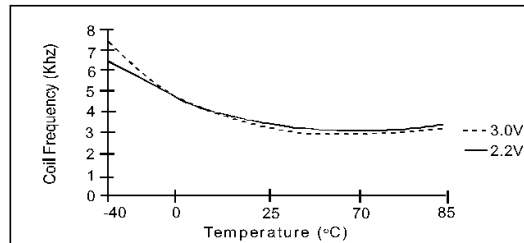
Peak to Peak Voltage vs. Temperature
 $C_{COIL}=220pF$; $C_{LAMP}=1500pF$; $Load=55nF$



Lamp Frequency vs. Temperature
 $C_{COIL}=220pF$; $C_{LAMP}=1500pF$; $Load=55nF$



Total Current vs. Temperature
 $C_{COIL}=220pF$; $C_{LAMP}=1500pF$; $Load=55nF$



Coil Frequency vs. Temperature
 $C_{COIL}=220pF$; $C_{LAMP}=1500pF$; $Load=55nF$

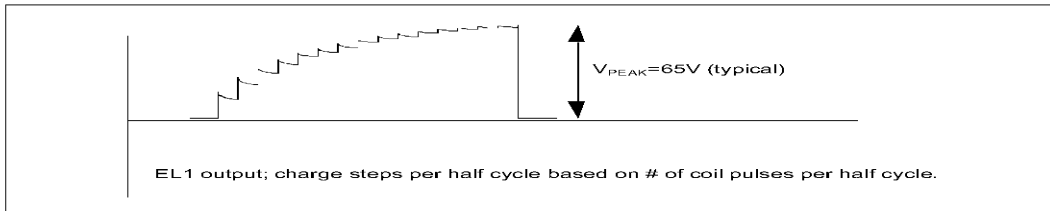


Figure 1. EL output voltage in discrete steps at EL1 output

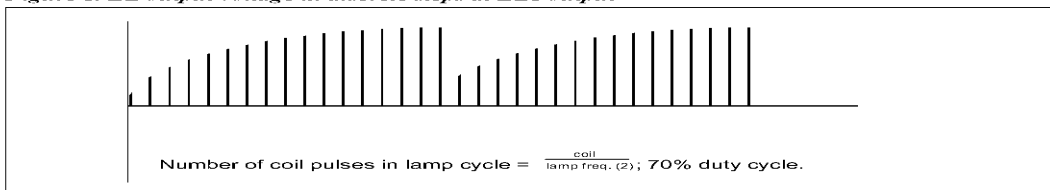


Figure 2. Voltage pulses released from the coil to the EL driver circuitry

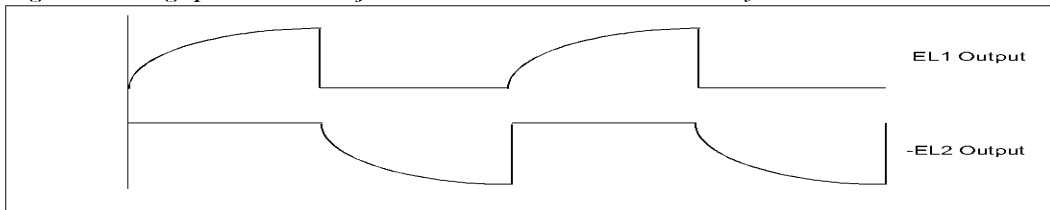


Figure 3. EL voltage waveforms from the EL1 and EL2 outputs

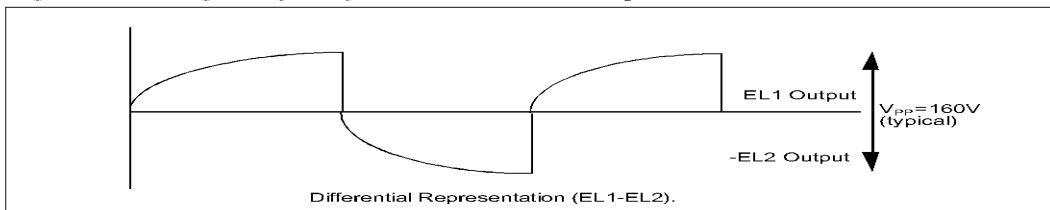
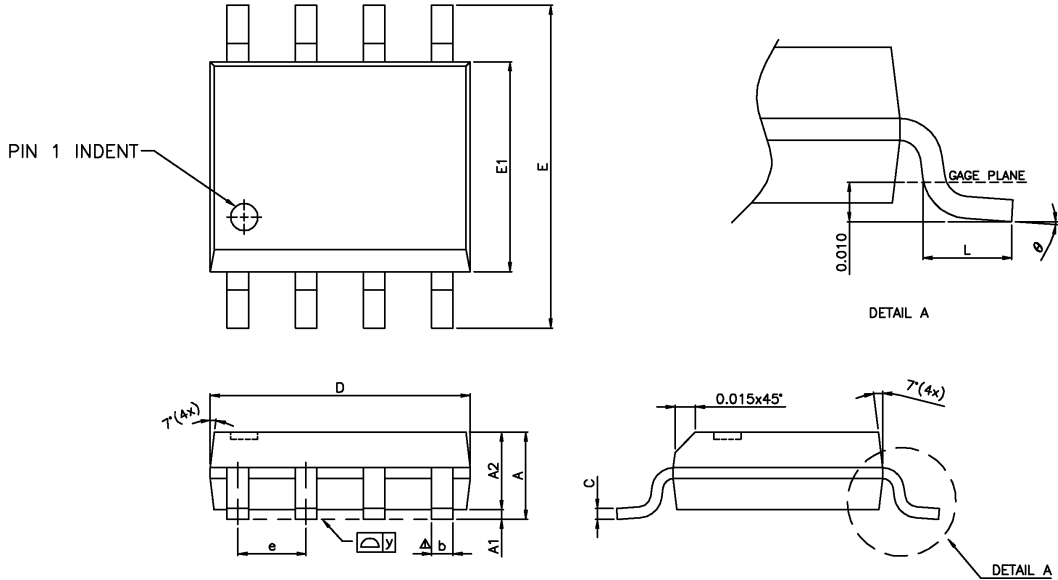


Figure 4. EL differential output waveform of the EL1 and EL2 outputs

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|---------------------------------------|------------|
| SB6543 | P.6 |
| LOW FREQUENCY EL DRIVER IC | |

SOP PIN CONFIGURATION & DIMENSION



| SYMBOLS | DIMENSIONS IN MILLIMETERS | | | DIMENSIONS IN INCHES | | |
|------------|---------------------------|------|-------|----------------------|-------|--------|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 1.47 | 1.60 | 1.73 | 0.058 | 0.063 | 0.068 |
| A1 | 0.10 | — | 0.25 | 0.004 | — | 0.010 |
| A2 | — | 1.45 | — | — | 0.057 | — |
| b | 0.33 | 0.41 | 0.51 | 0.013 | 0.016 | 0.020 |
| C | 0.19 | 0.20 | 0.25 | 0.0075 | 0.008 | 0.0098 |
| D | 4.80 | 4.85 | 4.95 | 0.189 | 0.191 | 0.195 |
| E | 5.80 | 6.00 | 6.20 | 0.228 | 0.236 | 0.244 |
| E1 | 3.80 | 3.90 | 4.00 | 0.150 | 0.154 | 0.157 |
| e | — | 1.27 | — | — | 0.050 | — |
| L | 0.38 | 0.71 | 1.27 | 0.015 | 0.028 | 0.050 |
| Δy | — | — | 0.076 | — | — | 0.003 |
| φ | 0° | — | 8° | 0° | — | 8° |

PIN CONFIGURATION

| PIN NUMBER | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|------------|-----|-----|------|-----|-----|-----|------|------|
| NAME | HON | VSS | COIL | EL2 | EL1 | VDD | CAP1 | CAP2 |