NIPPON PRECISION CIRCUITS INC.

SM8144B

EL Sheet Driver

OVERVIEW

The SM8144B is a transformer-less electroluminescent (EL) driver IC, capable of driving displays up to 80 cm^2 in size. It is a high-efficiency driver that features revised coil switching transistor ON resistance and output circuit configuration to reduce loss, all in a compact package.

A microcontroller interface pin (ENA) is provided, which can be used to control the EL driver ON/OFF function. The device is available in 8-pin VSOP packages.

FEATURES

- Dedicated EL driver
- 1.6 to 5.5 V supply voltage
- 100mA maximum operating current (V_{DD} = 3.0V, Ta ≤ 70°C)
- 3.5Ω typical output resistance
- 200 Vp-p maximum EL driver voltage*
- 31 to 1500 Hz EL drive frequency range*
- High voltage CMOS Process
- 8-pin VSOP plastic package

*: Adjustable with external resistance.

APPLICATIONS

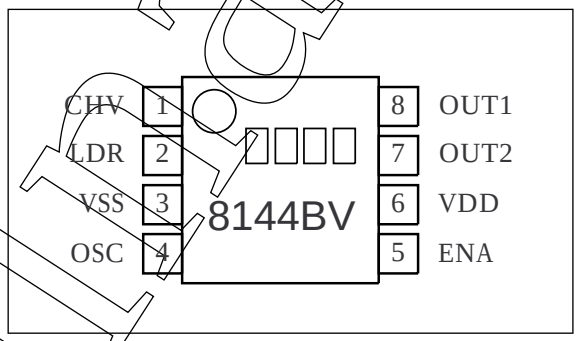
- Hand held PC, Palm size PC
- Mobile IT equipment
- White EL

ORDERING INFORMATION

Device	Package
SM8144BV	8-pin VSOP

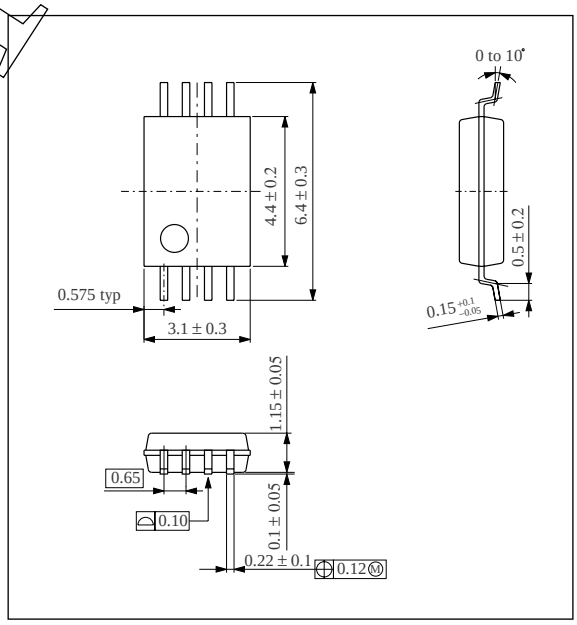
PINOUT

(Top view)

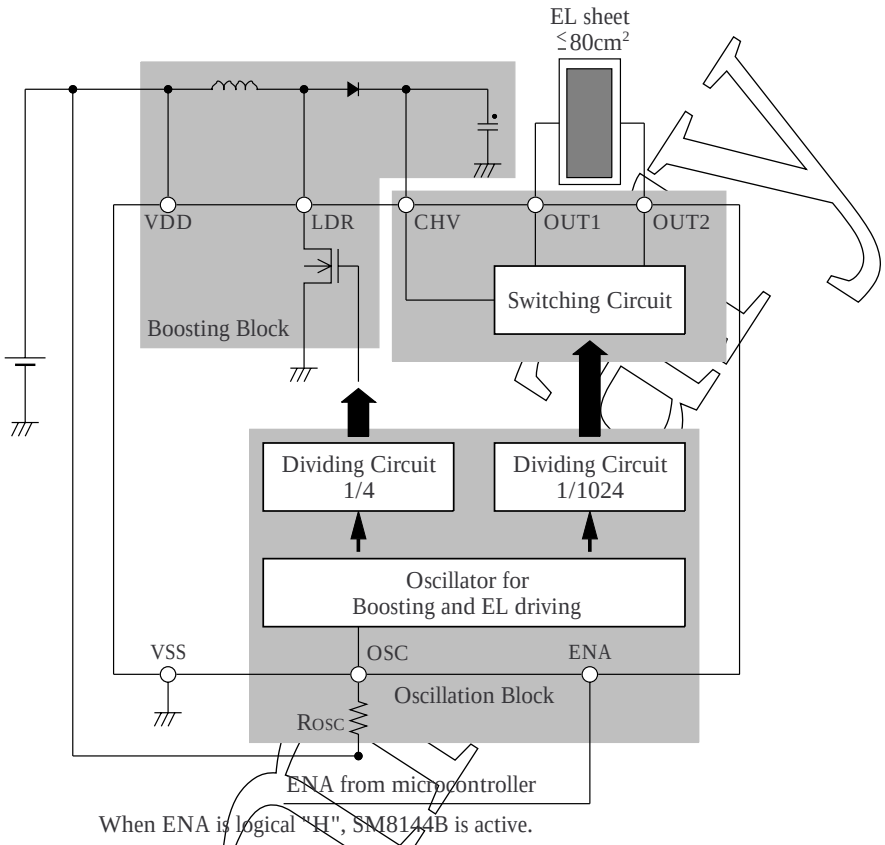


PACKAGE DIMENSIONS

(Unit : mm)



BLOCK DIAGRAM



PIN DESCRIPTION

Pin number	Name	I/O	Function
1	CHV	I	High-voltage DC input
2	LDR	O	Booster coil driver output
3	VSS	–	Ground
4	OSC	I	Coil and EL driver oscillator (oscillator frequency determined by external resistor)
5	ENA	I	Enable input (built-in pull-down resistor)
6	VDD	–	Supply
7	OUT2	O	Output 2
8	OUT1	O	Output 1

SPECIFICATIONS

Absolute Maximum Ratings

Parameter	Symbol	Condition	Rating	Unit
Supply voltage range	V_{DD}		– 0.3 to 7.0	V
Input voltage range	V_{IN}	All Input pins	V_{SS} – 0.3 to V_{DD} + 0.3	V
Output voltage	V_{CHV}	CHV pin	0.5 to 120	V
	V_{LDR}	LDR pin	0.5 to 120	V
	$V_{OUT1/2}$	OUT1, OUT2 pin	0.5 to 120	V
Power dissipation	P_D	$T_a \leq 70$ °C	140	mW
		$T_a \leq 85$ °C	100	mW
Storage temperature range	T_{STG}		– 55 to 125	°C

Recommended Operating Conditions

Parameter	Symbol	Condition	Rating			Unit
			min	typ	max	
Supply voltage range	V_{DD2}		1.6	3.0	5.5	V
Operating temperature	T_{OPR}		– 40	–	85	°C
Operating current[1]	I_{DD2}	Including coil current, V_{DD} = 3.0V, $T_a \leq 70$ °C	–	–	100	mA
		Including coil current, V_{DD} = 5.0V, $T_a \leq 70$ °C	–	–	60	mA
		Including coil current, V_{DD} = 3.0V, $T_a \leq 85$ °C	–	–	70	mA
		Including coil current, V_{DD} = 5.0V, $T_a \leq 85$ °C	–	–	42	mA
Coil inductance	L_{LDR}	f_{LDR} = 64 kHz	–	0.47	–	mH

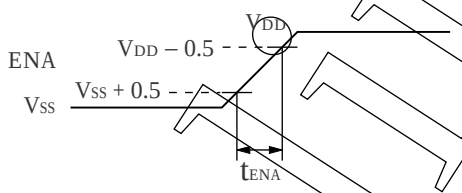
1. Max value is as same as Absolute Maximum Ratings.

DC Characteristics

V_{DD} = 3.0 V, T_a = 25 °C unless otherwise noted.

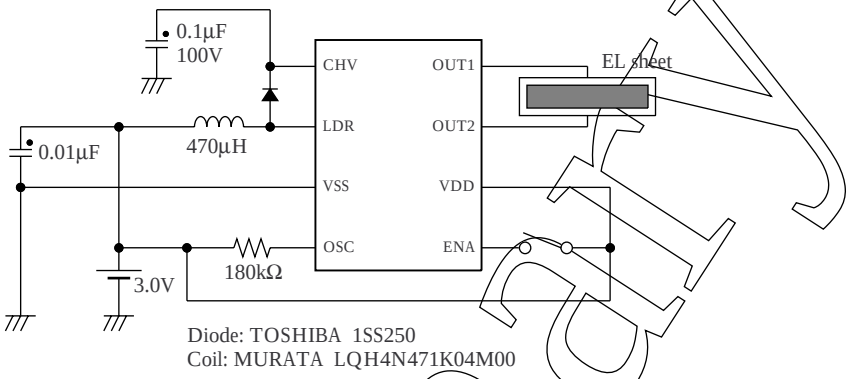
Parameter	Symbol	Condition	Rating			Unit
			min	typ	max	
Supply voltage	V_{DD}		1.6	3.0	5.5	V
CHV output voltage	V_{CHV}		0.5	–	100	V
OUT1, OUT2 HIGH-level output voltage	V_{OUTH}		–		100	V
OUT1, OUT2 LOW-level output voltage	V_{OUTL}		–	–	0.5	V
LDR output resistance	R_{LDR}	I_{LDR} = 50 mA	–	3.5	5.25	Ω
OSC oscillator frequency	f_{OSC1}	R_{OSC} = 180 kΩ	205	256	307	kHz
OSC oscillator frequency range	f_{OSC2}		32	–	1536	
OUT1, OUT2 output frequency	f_{OUT1}	R_{OSC} = 180 kΩ	200	250	300	Hz
OUT1, OUT2 output frequency range	f_{OUT2}		31	–	1500	
LDR inductance driver frequency	f_{LDR1}	R_{OSC} = 180 kΩ	51	64	77	kHz
LDR inductance driver frequency range	f_{LDR2}		8	–	384	
ENA HIGH-level input voltage	V_{ENAH}	ENA = HIGH, V_{DD} = 1.6 to 5.5V	V_{DD} – 0.5	–	V_{DD} + 0.3	V
ENA LOW-level input voltage	V_{ENAL}	ENA = LOW, V_{DD} = 1.6 to 5.5V	V_{SS} – 0.3	–	V_{SS} + 0.5	
ENA input current	I_{ENAH}	V_{ENAH} = V_{DD} = 3.0V	2.0	4.0	6.0	µA
ENA rise time[1]	t_{ENA}		–	–	100	µs
Operating current	I_{DD1}	Excluding coil current	–	–	1.0	mA
Stand-by current	I_{STB}	ENA = LOW	–	–	1.0	µA

1.



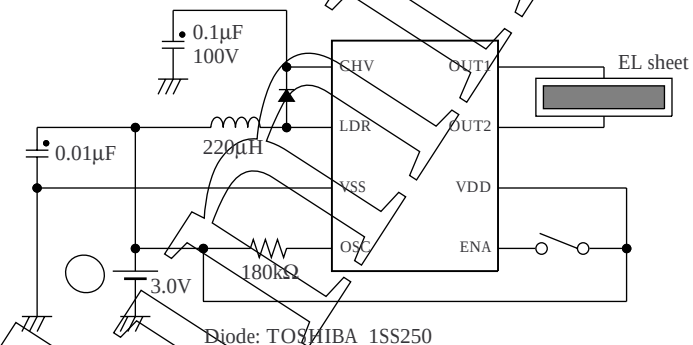
TYPICAL APPLICATIONS

■ EL sheet size: 20 to 30cm^2, Current consumption: 20mA



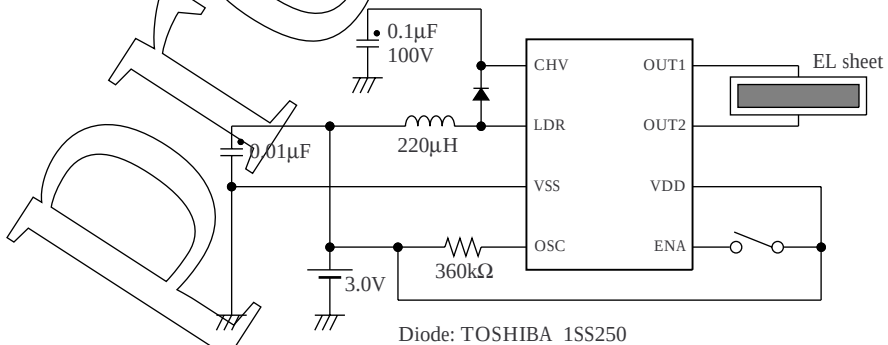
Diode: TOSHIBA 1SS250
Coil: MURATA LQH4N471K04M00

■ EL sheet size: 30 to 50cm^2, Current consumption: 40mA



Diode: TOSHIBA 1SS250
Coil: MURATA LQH4N221K04M00

■ EL sheet size: 50 to 100cm^2, Current consumption: 80mA



Diode: TOSHIBA 1SS250
Coil: TOKO D73LC (817CE221M)

Note: Do not operate the SM8144B with the EL sheet NOT connected (no load to OUT1/OUT2) since the IC will be damaged.

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