

### OVERVIEW

The SM8144B is a transformer-less electroluminescent (EL) driver IC, capable of driving displays up to 70 cm<sup>2</sup> in size. It is a high-efficiency driver that features revised inductor 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 5.5V supply voltage
- 100mA maximum operating current  
( $V_{DD} = 3.0V$ ,  $T_a \leq 70^\circ C$ )
- 3.5Ω typical output resistance
- 200Vp-p maximum EL driver voltage\*
- 31 to 1500Hz EL drive frequency range\*
- High voltage CMOS Process
- 8-pin VSOP plastic package

\*: Adjustable with external resistance.

### APPLICATIONS

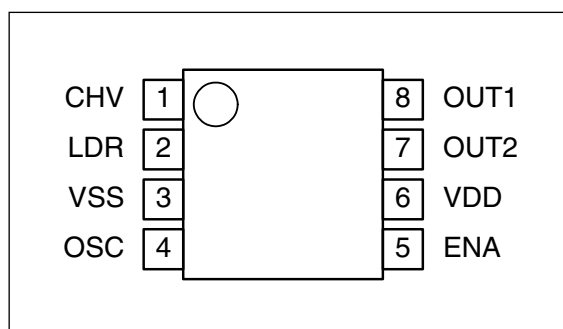
- Hand held PC, Palm size PC
- Mobile IT equipment
- White EL

### ORDERING INFORMATION

Device	Package
SM8144BV	8-pin VSOP

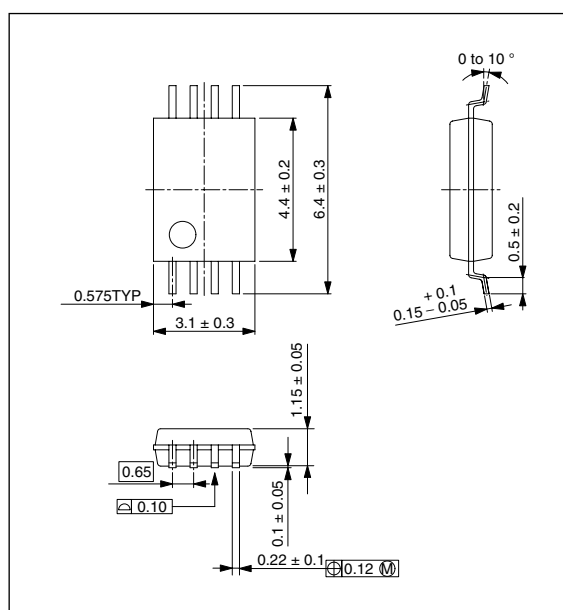
### PINOUT

(Top view)

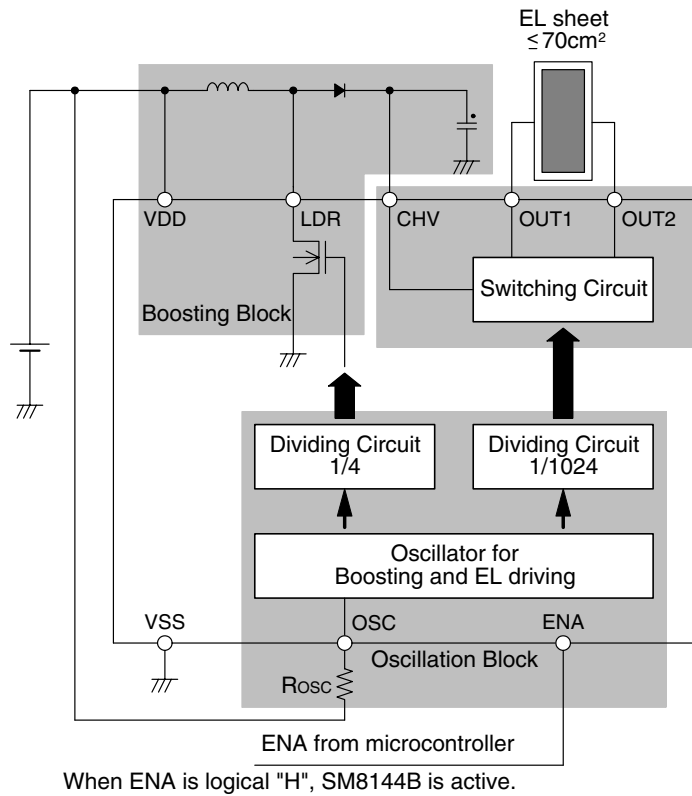


### PACKAGE DIMENSIONS

(Unit : mm)



**BLOCK DIAGRAM**



**PIN DESCRIPTION**

Pin number	Name	I/O	Function
1	CHV	I	High-voltage DC input
2	LDR	O	Booster inductor driver output
3	VSS	-	Ground
4	OSC	I	Inductor and EL driver oscillator (oscillator frequency determined by external resistor)
5	ENA	Ip <sup>1</sup>	Enable input (HIGH: enable, LOW: disable)
6	VDD	-	Supply
7	OUT2	O	Output 2
8	OUT1	O	Output 1

1. Built-in pull-down resistor.

## 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	$P_D$	$T_a \leq 70^\circ\text{C}$	140	mW
		$T_a \leq 85^\circ\text{C}$	100	mW
Storage temperature range	$T_{STG}$		- 55 to 125	$^\circ\text{C}$

### 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	$^\circ\text{C}$
Operating current <sup>1</sup>	$I_{DD2}$	Including inductor current, $V_{DD} = 3.0\text{V}$ , $T_a \leq 70^\circ\text{C}$	-	-	100	mA
		Including inductor current, $V_{DD} = 5.0\text{V}$ , $T_a \leq 70^\circ\text{C}$	-	-	60	mA
		Including inductor current, $V_{DD} = 3.0\text{V}$ , $T_a \leq 85^\circ\text{C}$	-	-	70	mA
		Including inductor current, $V_{DD} = 5.0\text{V}$ , $T_a \leq 85^\circ\text{C}$	-	-	42	mA
Inductance	$L_{LDR}$	$f_{LDR} = 64\text{kHz}$	-	0.47	-	mH

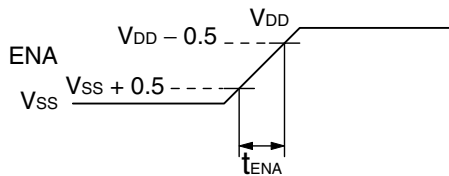
1. Max value is as same as Absolute Maximum Ratings.

## Electrical Characteristics

$V_{DD} = 3.0V$ ,  $T_a = 25^\circ C$  unless otherwise noted.

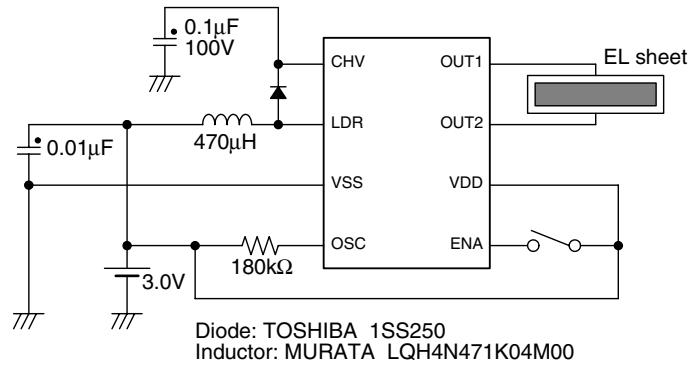
Parameter	Symbol	Condition	Rating			Unit
			min	typ	max	
Supply voltage	$V_{DD}$		1.6	3.0	5.5	V
CHV output voltage	$V_{CHV}$		0.5	–	100	V
OUT1, OUT2 HIGH-level output voltage	$V_{OUTH}$		–	–	100	V
OUT1, OUT2 LOW-level output voltage	$V_{OUTL}$		–	–	0.5	V
LDR output resistance	$R_{LDR}$	$I_{LDR} = 50mA$	–	3.5	5.25	$\Omega$
OSC oscillator frequency	$f_{OSC1}$	$R_{OSC} = 180k\Omega$	205	256	307	kHz
OSC oscillator frequency range	$f_{OSC2}$		32	–	1536	
OUT1, OUT2 output frequency	$f_{OUT1}$	$R_{OSC} = 180k\Omega$	200	250	300	Hz
OUT1, OUT2 output frequency range	$f_{OUT2}$		31	–	1500	
LDR inductance driver frequency	$f_{LDR1}$	$R_{OSC} = 180k\Omega$	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	$\mu A$
ENA rise time <sup>1</sup>	$t_{ENA}$		–	–	100	$\mu s$
Operating current	$I_{DD1}$	Excluding inductor current	–	–	1.0	mA
Stand-by current	$I_{STB}$	ENA = LOW	–	–	1.0	$\mu A$

1.

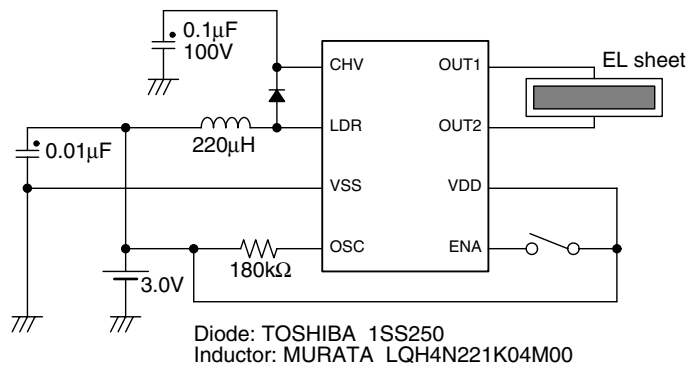


## TYPICAL APPLICATIONS

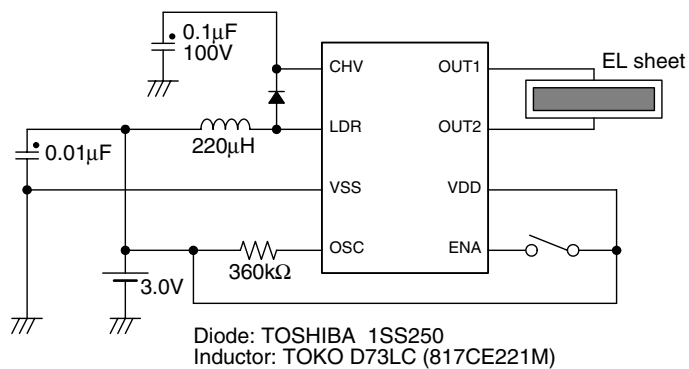
- EL sheet size: 20 to 30cm<sup>2</sup>, Current consumption: 20mA



- EL sheet size: 30 to 50cm<sup>2</sup>, Current consumption: 40mA



- EL sheet size: 50 to 100cm<sup>2</sup>, Current consumption: 80mA



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

Please pay your attention to the following points at time of using the products shown in this document.

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