

**OVERVIEW**

The SM8141 is a transformer-less electroluminescent (EL) sheet lamp driver, capable of driving sheets up to 50cm<sup>2</sup> in size. It employs built-in high withstand voltage output MOS transistors and requires few external components, making it ideal for compact driver units in portable equipment.

**FEATURES**

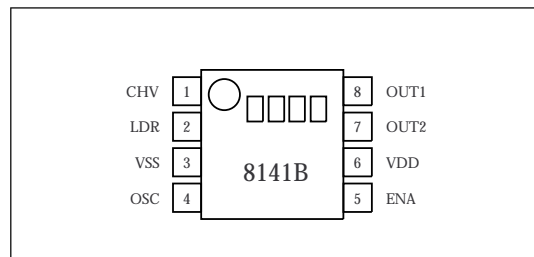
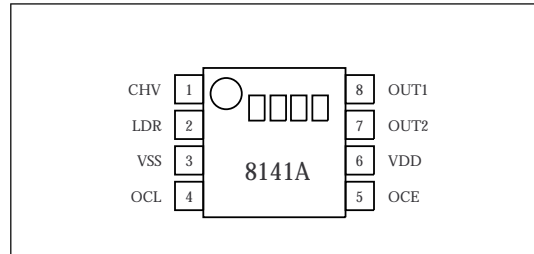
- Dedicated EL driver
- 50cm<sup>2</sup> maximum EL sheet drive capability
- Noise-less smooth drive waveform
- Two oscillators (EL and coil)(SM8141A)
- Stand-by function (SM8141B)
- High-efficiency MOS transistor driver
- Dual supply operation possible (See TYPICAL APPLICATIONS)
- 2.0 to 5.5V supply operation
- 200Vp-p maximum drive voltage
- 250Hz standard drive frequency
- 8-pinVSOP package
- Chip form

**ORDERING INFORMATION**

DEVICE	PACKAGE
SM8141AV	8pin VSOP
SM8141BV	8pin VSOP
CF8141A	Chip form
CF8141B	Chip form

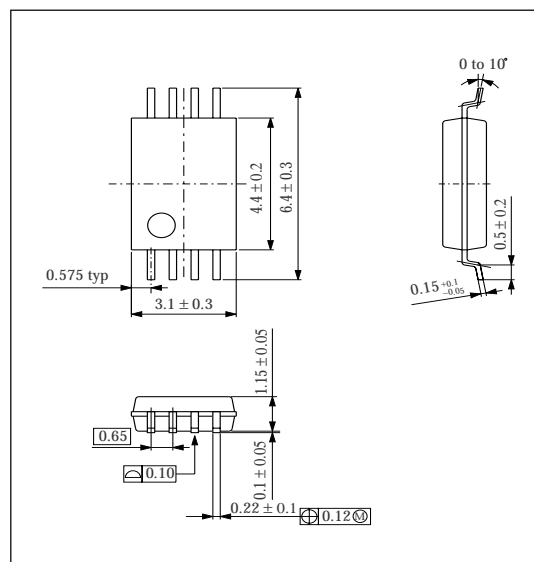
**PINOUT**

**8pin VSOP (TOP VIEW)**



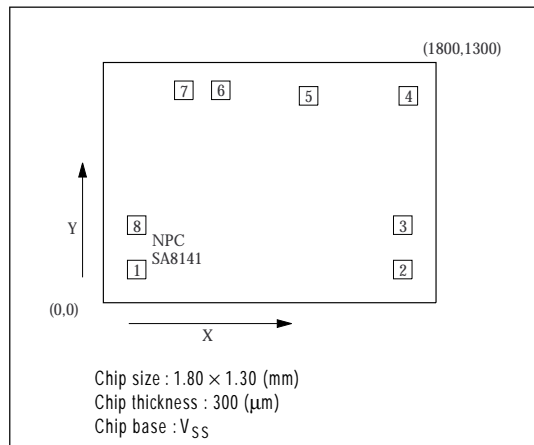
**PACKAGE DIMENSIONS**

(Unit : mm)



## PAD DIMENSIONS

(Unit : mm)



## PIN DESCRIPTION

### • SM8141A

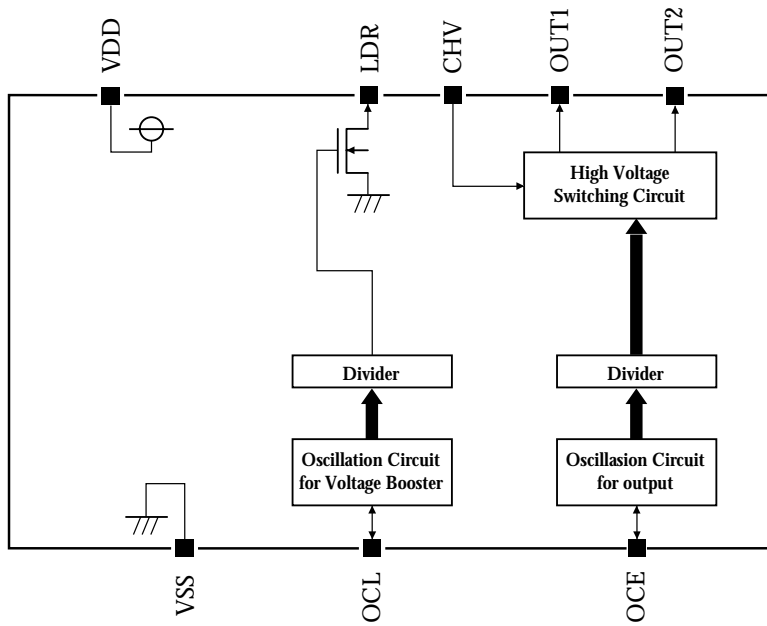
Pin number	Pad number	Name	Pad dimensions		I/O	Function
			X (μm)	Y (μm)		
1	6	CHV	635	1150	I	High-voltage DC input
2	7	LDR	435	1150	O	Booster coil driver output
3	8	VSS	180	420	-	Ground
4	1	OCL	180	180	I	Coil driver oscillator (oscillator frequency determined by external variable resistor)
5	2	OCE	1620	180	I	EL driver oscillator (oscillator frequency determined by external variable resistor)
6	3	VDD	1620	420	-	Supply
7	4	OUT2	1650	1120	O	Output 2
8	5	OUT1	1110	1120	O	Output 1

### • SM8141B

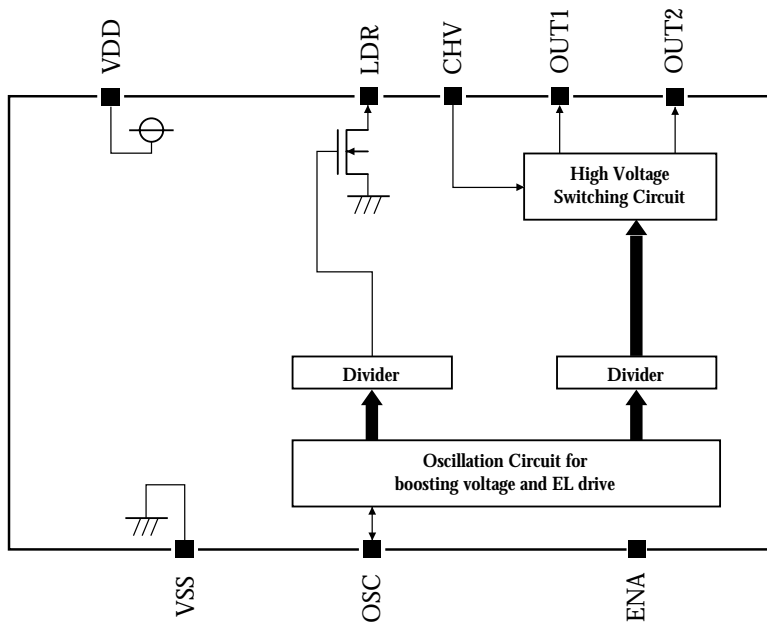
Pin number	Pad number	Name	Pad dimensions		I/O	Function
			X (μm)	Y (μm)		
1	6	CHV	635	1150	I	High-voltage DC input
2	7	LDR	435	1150	O	Booster coil driver output
3	8	VSS	180	420	-	Ground
4	1	OSC	180	180	I	Coil and EL driver oscillator (oscillator frequency determined by external variable resistor)
5	2	ENA	1620	180	I	Enable input (built-in pull-down resistor)
6	3	VDD	1620	420	-	Supply
7	4	OUT2	1650	1120	O	Output 2
8	5	OUT1	1110	1120	O	Output 1

**BLOCK DIAGRAM**

- SM8141A



- SM8141B



## SPECIFICATIONS

### Absolute Maximum Ratings

$V_{SS} = 0\text{ V}$

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
Storage temperature range	$T_{STG}$		- 55 to 125	°C
Power dissipation	$P_D$	$T_a \leq 85\text{ °C}$	100	mW
Soldering temperature	$T_{SLD}$		255	°C
Soldering time	$t_{SLD}$		10	s

### Recommended Operating Conditions

$V_{SS} = 0\text{ V}$

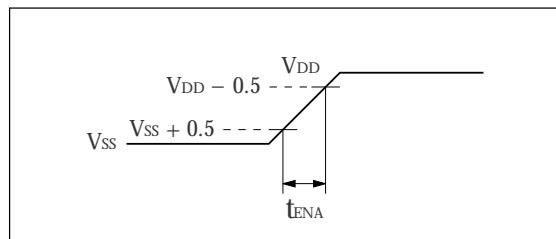
Parameter	Symbol	Condition	Rating			Unit
			min	typ	max	
Supply voltage	$V_{DD}$		2.0	3.0	5.5	V
Operating temperature	$T_{OPR}$		- 40	-	85	°C
Operating current <sup>1</sup>	$I_{DD2}$	Including coil current, $V_{DD} = 3.0\text{V}$	-	-	60	mA
		Including coil current, $V_{DD} = 5.0\text{V}$	-	-	36	
Coil inductance	$L_{LDR2}$	$f_{LDR} = 64\text{ kHz}$	-	0.47	-	mH

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

## DC Characteristics

$T_a = 25\text{ }^\circ\text{C}$ ,  $V_{SS} = 0\text{ V}$ ,  $V_{DD} = 3.0\text{ V}$  unless otherwise noted

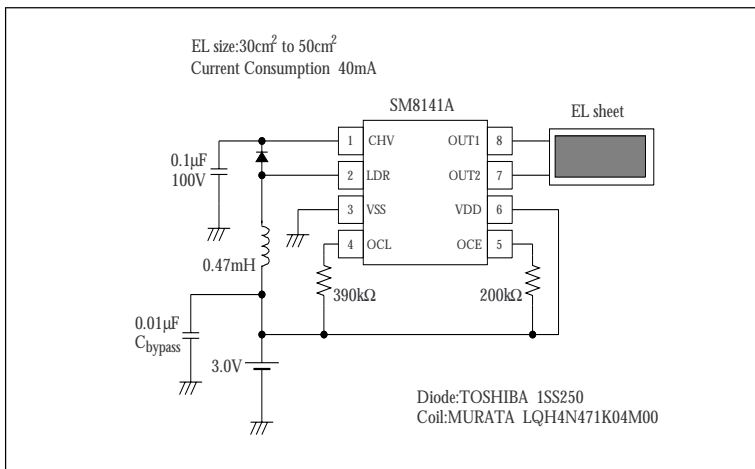
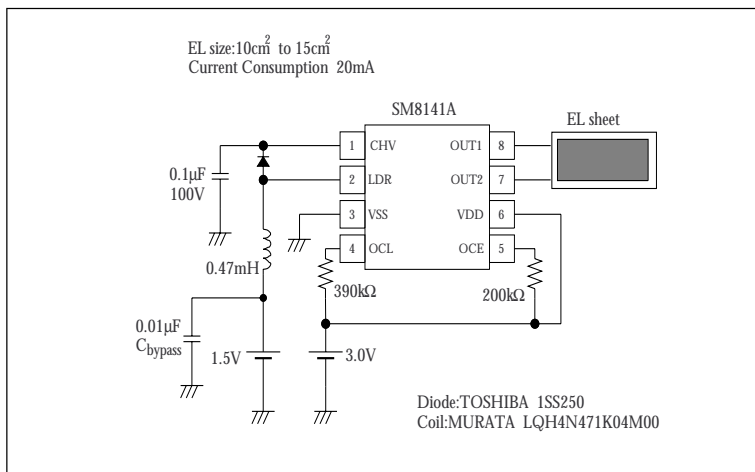
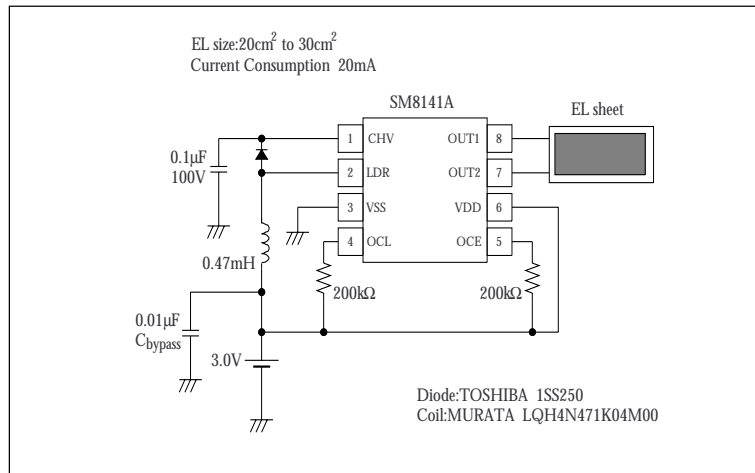
Parameter	Ver.	Symbol	Condition	Rating			Unit
				min	typ	max	
Supply voltage	A / B	$V_{DD}$		2.0	3.0	5.5	V
CHV output voltage	A / B	$V_{CHV}$		0.5	-	100	V
OUT1, OUT2 HIGH-level output voltage	A / B	$V_{OUTH}$		-	-	100	V
OUT1, OUT2 LOW-level output voltage	A / B	$V_{OUTL}$		-	-	0.5	V
LDR output resistance	A / B	$R_{LDR}$	$I_{LDR} = 50\text{ mA}$	-	8.0	12.0	$\Omega$
OCE oscillator frequency	A	$f_{OCE1}$	$R_{OCE} = 200\text{ k}\Omega$	205	256	307	kHz
OCE oscillator frequency range		$f_{OCE2}$		32	-	1024	
OCL oscillator frequency	A	$f_{OCL1}$	$R_{OCL} = 200\text{ k}\Omega$	205	256	307	kHz
OCL oscillator frequency range		$f_{OCL2}$		32	-	1024	
OSC oscillator frequency	B	$f_{OSC1}$	$R_{OSC} = 200\text{ k}\Omega$	205	256	307	kHz
OSC oscillator frequency range		$f_{OSC2}$		32	-	1024	
OUT1, OUT2 output frequency	A / B	$f_{OUT1}$	$R_{OCE}/R_{OSC} = 200\text{ k}\Omega$	200	250	300	Hz
OUT1, OUT2 output frequency range		$f_{OUT2}$		31	-	1000	
LDR inductance driver frequency	A / B	$f_{LDR1}$	$R_{OCL}/R_{OSC} = 200\text{ k}\Omega$	51	64	77	kHz
LDR inductance driver frequency range		$f_{LDR2}$		8	-	256	
ENA HIGH-level input voltage	B	$V_{ENAH}$	ENA = "H", $V_{DD} = 2.0\text{ to }5.5\text{ V}$	$V_{DD} - 0.5$	-	$V_{DD} + 0.3$	V
ENA LOW-level input voltage		$V_{ENAL}$	ENA = "L", $V_{DD} = 2.0\text{ to }5.5\text{ V}$	$V_{SS} - 0.3$	-	$V_{SS} + 0.5$	
ENA input current	B	$I_{ENAH}$	$V_{ENAH} = 3.0\text{ V}$ , $V_{DD} = 3.0\text{ V}$	2.0	4.0	6.0	$\mu\text{A}$
Operating current	A / B	$I_{DD1}$	Excluding coil current	-	-	1	mA
Stand-by current	B	$I_{STB}$	ENA = "L"	-	-	1	$\mu\text{A}$
ENA rise time	B	$t_{ENA}$	$V_{ENAL} \rightarrow V_{ENAH}$	-	-	100	ms



Rise time

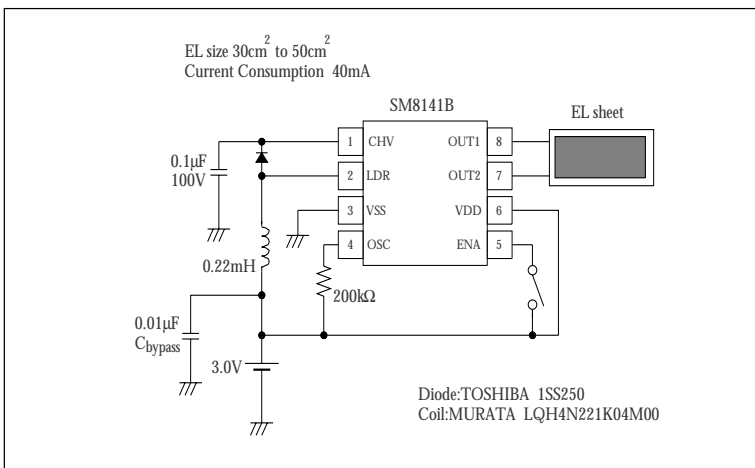
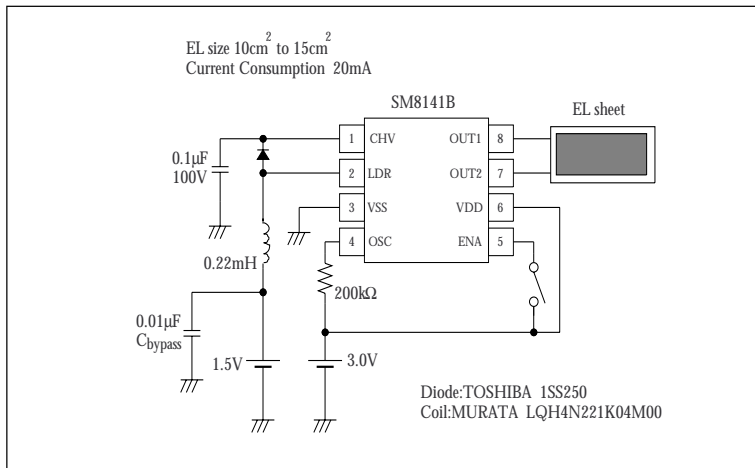
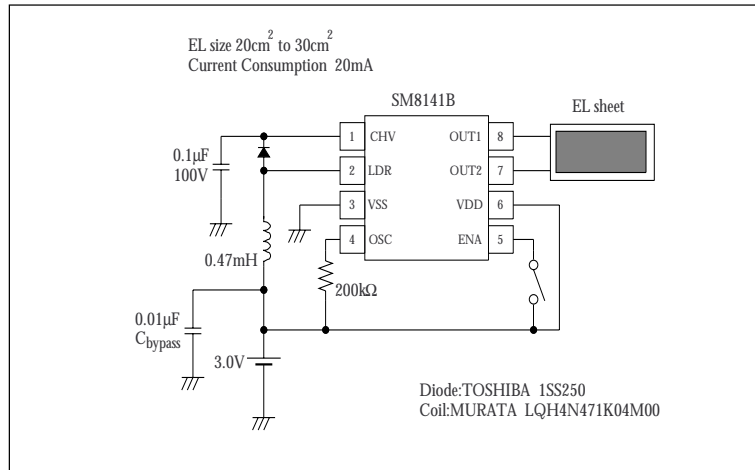
TYPICAL APPLICATIONS

• SM8141A



# SM8141

- SM8141B



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