

### 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

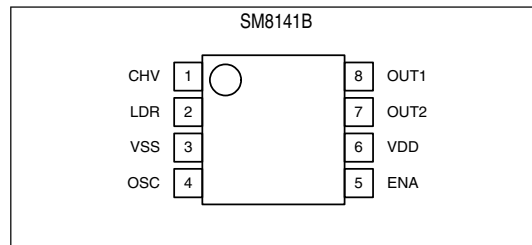
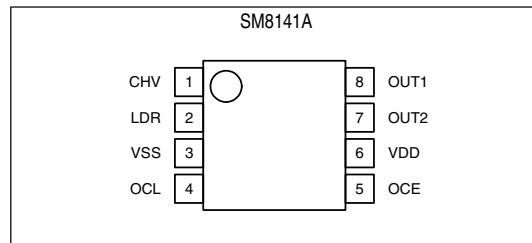
- Dedicated EL driver
- 50cm<sup>2</sup> maximum EL sheet drive capability
- Noise-less smooth drive waveform
- Two oscillators (EL and coil)(SM8141A)
- Stand-by function (SM8141B)
- High-efficiency MOS transistor driver
- Dual supply operation possible  
(See TYPICAL APPLICATIONS)
- 2.0 to 5.5V supply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

### ORDERING INFORMATION

Device	Package
SM8141AV	8pin VSOP
SM8141BV	
CF8141A	Chip form
CF8141B	

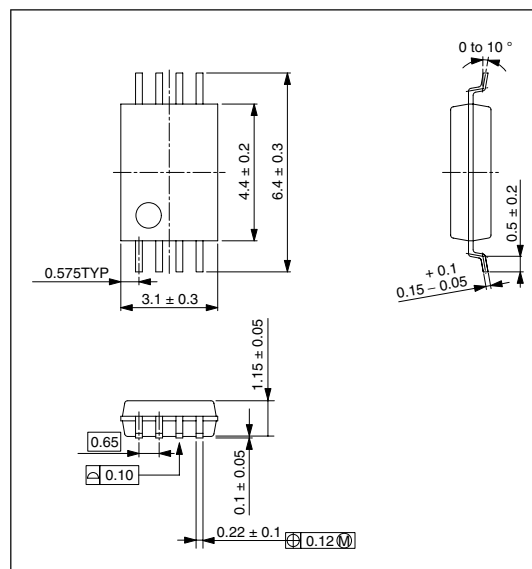
### PINOUT

(Top view)



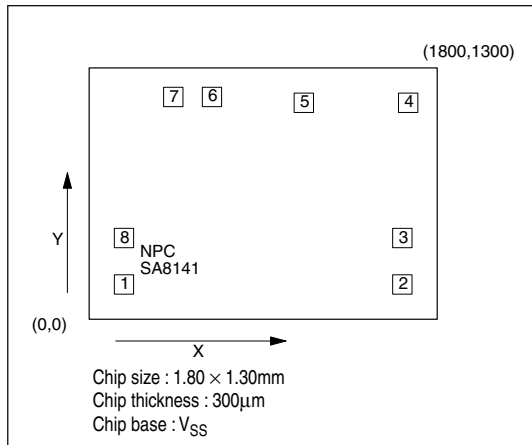
### PACKAGE DIMENSIONS

(Unit: mm)



## PAD DIMENSIONS

(Unit: mm)



## PIN DESCRIPTION

### • SM8141A

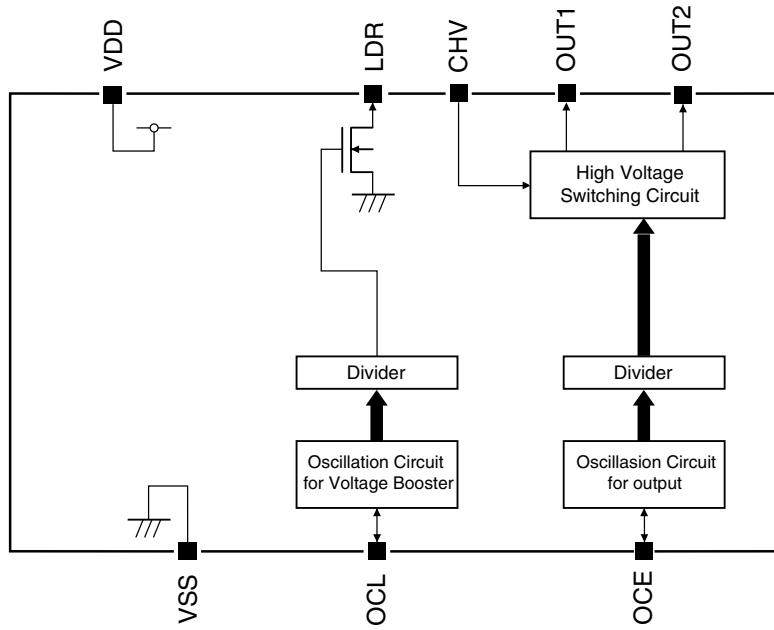
Pin number	Pad number	Name	Pad dimensions		I/O	Function
			X [μm]	Y [μm]		
1	6	CHV	635	1150	I	High-voltage DC input
2	7	LDR	435	1150	O	Booster coil driver output
3	8	VSS	180	420	–	Ground
4	1	OCL	180	180	I	Coil driver oscillator (oscillator frequency determined by external variable resistor)
5	2	OCE	1620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

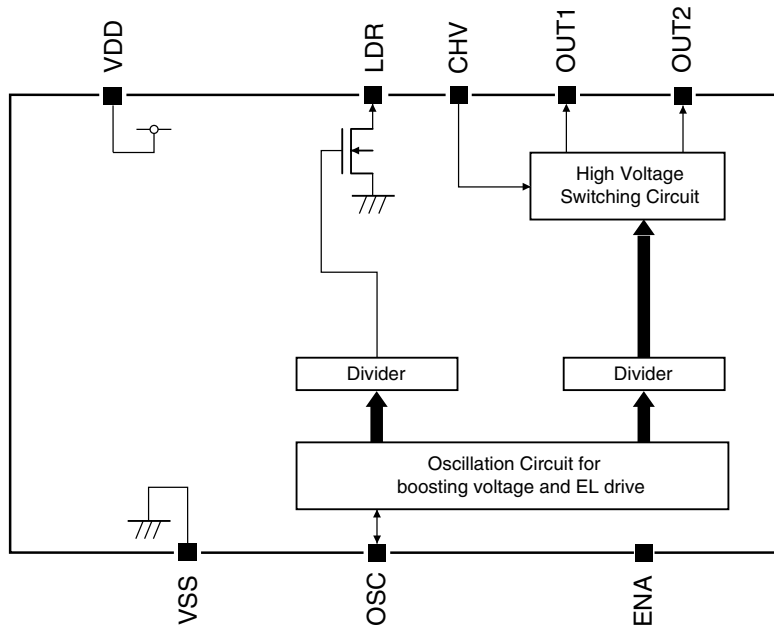
Pin number	Pad number	Name	Pad dimensions		I/O	Function
			X [μm]	Y [μm]		
1	6	CHV	635	1150	I	High-voltage DC input
2	7	LDR	435	1150	O	Booster coil driver output
3	8	VSS	180	420	–	Ground
4	1	OSC	180	180	I	Coil and EL driver oscillator (oscillator frequency determined by external variable resistor)
5	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

$V_{SS} = 0V$

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	$P_D$	$T_a \leq 85^\circ C$	100	mW

### Recommended Operating Conditions

$V_{SS} = 0V$

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, $V_{DD} = 3.0V$	-	-	60	mA
		Including coil current, $V_{DD} = 5.0V$	-	-	36	
Coil inductance	$L_{LDR2}$	$f_{LDR} = 64kHz$	-	0.47	-	mH

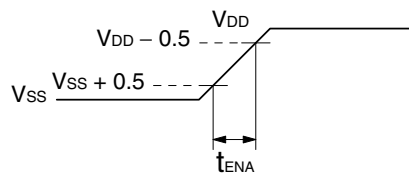
1. Max value is as same as Absolute Maximum Ratings.

## DC Characteristics

Ta = 25°C, V<sub>SS</sub> = 0V, V<sub>DD</sub> = 3.0V unless otherwise noted

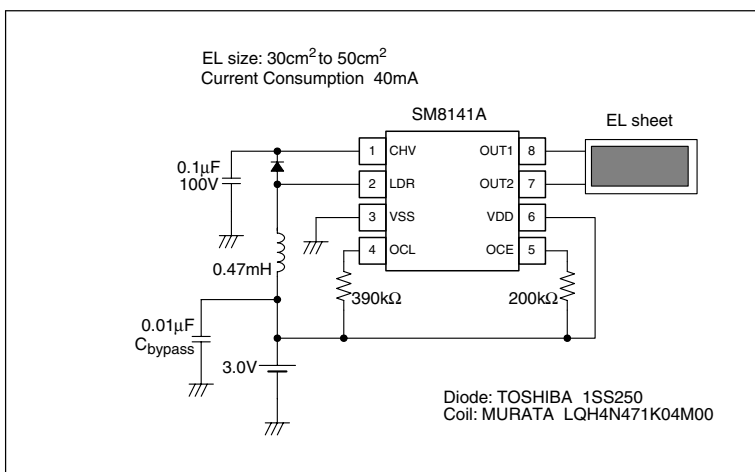
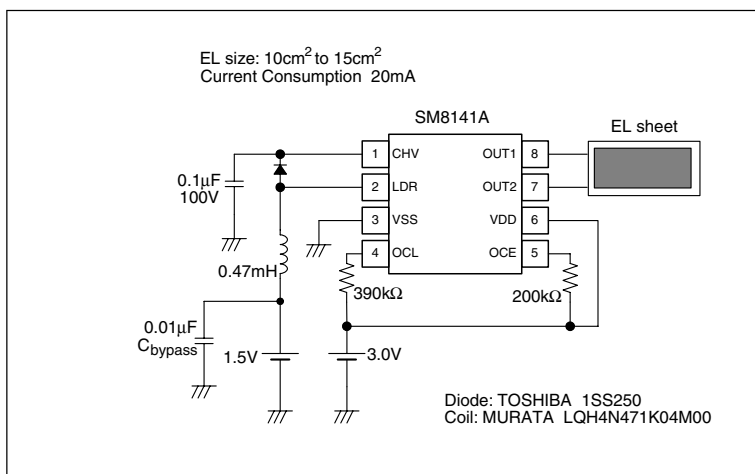
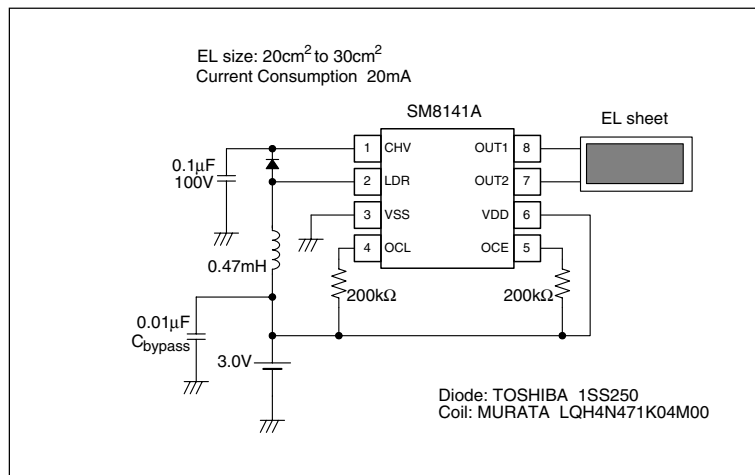
Parameter	Ver.	Symbol	Condition	Rating			Unit
				min	typ	max	
Supply voltage	A/B	V <sub>DD</sub>		2.0	3.0	5.5	V
CHV output voltage	A/B	V <sub>CHV</sub>		0.5	–	100	V
OUT1, OUT2 HIGH-level output voltage	A/B	V <sub>OUTH</sub>		–	–	100	V
OUT1, OUT2 LOW-level output voltage	A/B	V <sub>OUTL</sub>		–	–	0.5	V
LDR output resistance	A/B	R <sub>LDR</sub>	I <sub>LDR</sub> = 50mA	–	8.0	12.0	Ω
OCE oscillator frequency	A	f <sub>OCE1</sub>	R <sub>OCE</sub> = 200kΩ	205	256	307	kHz
OCE oscillator frequency range		f <sub>OCE2</sub>		32	–	1024	
OCL oscillator frequency	A	f <sub>OCL1</sub>	R <sub>OCL</sub> = 200kΩ	205	256	307	kHz
OCL oscillator frequency range		f <sub>OCL2</sub>		32	–	1024	
OSC oscillator frequency	B	f <sub>OSC1</sub>	R <sub>OSC</sub> = 200kΩ	205	256	307	kHz
OSC oscillator frequency range		f <sub>OSC2</sub>		32	–	1024	
OUT1, OUT2 output frequency	A/B	f <sub>OUT1</sub>	R <sub>OCE</sub> /R <sub>OSC</sub> = 200kΩ	200	250	300	Hz
OUT1, OUT2 output frequency range		f <sub>OUT2</sub>		31	–	1000	
LDR inductance driver frequency	A/B	f <sub>LDR1</sub>	R <sub>OCL</sub> /R <sub>OSC</sub> = 200kΩ	51	64	77	kHz
LDR inductance driver frequency range		f <sub>LDR2</sub>		8	–	256	
ENA HIGH-level input voltage	B	V <sub>ENAH</sub>	ENA = "H", V <sub>DD</sub> = 2.0 to 5.5V	V <sub>DD</sub> – 0.5	–	V <sub>DD</sub> + 0.3	V
ENA LOW-level input voltage		V <sub>ENAL</sub>	ENA = "L", V <sub>DD</sub> = 2.0 to 5.5V	V <sub>SS</sub> – 0.3	–	V <sub>SS</sub> + 0.5	
ENA input current	B	I <sub>ENAH</sub>	V <sub>ENAH</sub> = 3.0V, V <sub>DD</sub> = 3.0V	2.0	4.0	6.0	μA
Operating current	A/B	I <sub>DD1</sub>	Excluding coil current	–	–	1	mA
Stand-by current	B	I <sub>STB</sub>	ENA = "L"	–	–	1	μA
ENA rise time <sup>1</sup>	B	t <sub>ENA</sub>	V <sub>ENAL</sub> → V <sub>ENAH</sub>	–	–	100	ms

1.



TYPICAL APPLICATIONS

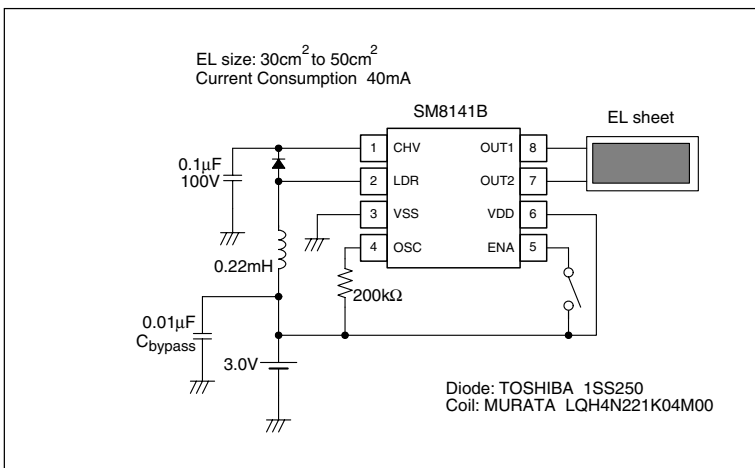
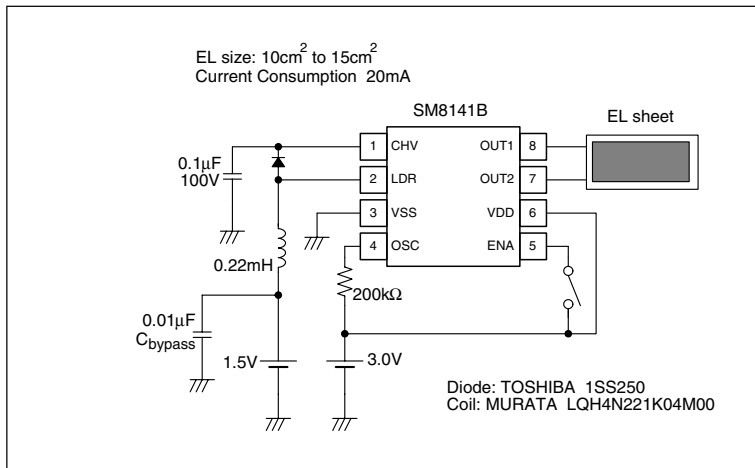
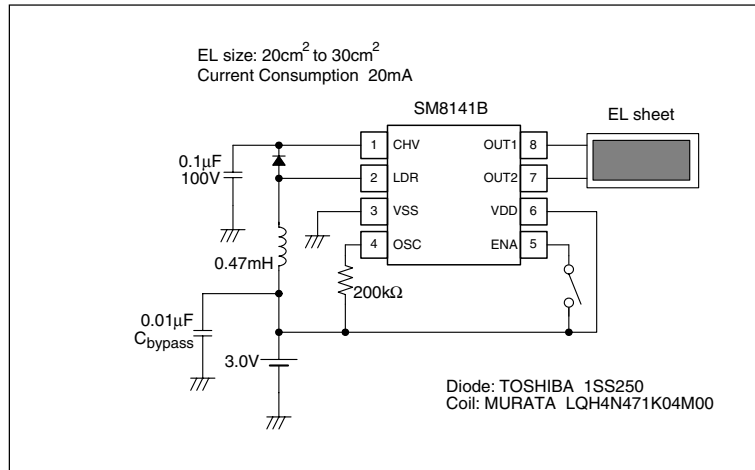
• SM8141A



Note) Do not operate the SM8141 with the EL sheet NOT connected (no load to OUT1/OUT2) since the IC will be damaged.

## SM8141

- SM8141B



(Note) Do not operate the SM8141 with the EL sheet NOT connected (no load to OUT1/OUT2) since the IC will be damaged.

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