

## OVERVIEW

The SM8142 is a transformer-less electroluminescent (EL) sheet lamp driver, capable of driving sheets up to 30 cm<sup>2</sup> in size. It employs a high-efficiency driver output circuit configuration to control power dissipation. It is available in ultra-small 8-pin SON (Small Outline Non-leaded) packages\*, making possible the construction of small, thin, low-power driver units.

\* : SM8142xD

## FEATURES

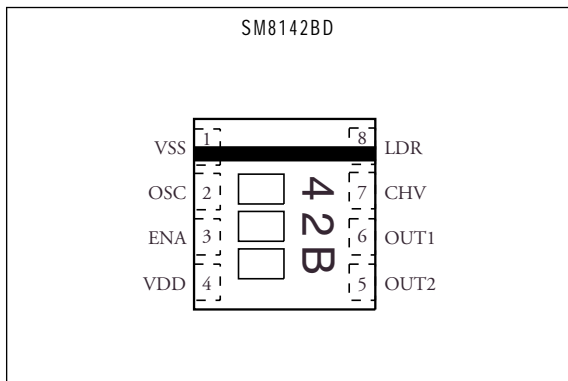
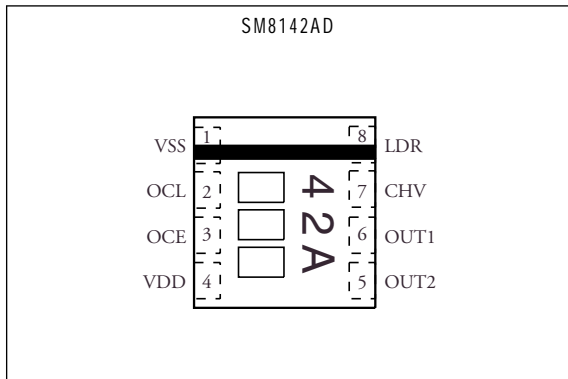
- Dedicated EL driver
- Noise-less smooth drive waveform
- High-efficiency output circuit
- Two oscillator circuits built-in (SM8142A)
- Stand-by function (SM8142B)
- Stable temperature characteristics
- Ultra-small package
- 1.6 to 5.5 V supply voltage
- 0.3 mA typ. ( $V_{DD} = 3.0\text{ V}$ ) current consumption (excluding coil current)
- 200 Vp-p maximum EL driver voltage
- 31 to 1000 Hz EL drive frequency range
- 0.22 mH minimum coil inductance

## ORDERING INFORMATION

Device	Package
SM8142AD	8-pin SON
SM8142BD	8-pin SON
SM8142AV	8-pin VSOP
SM8142BV	8-pin VSOP

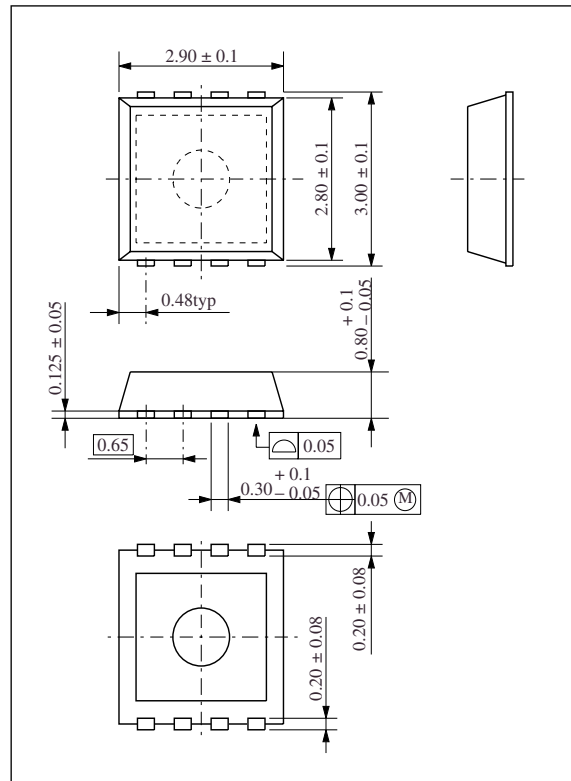
**PINOUT (Top View)**

■ 8-pin SON

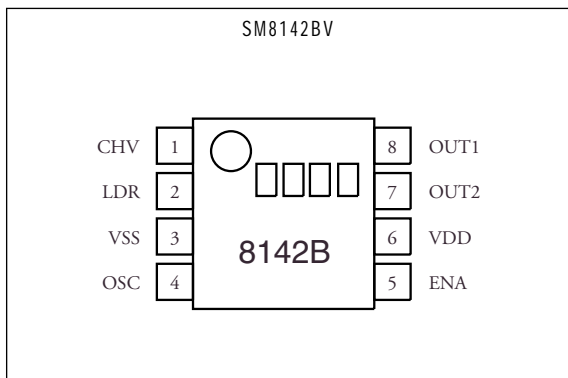
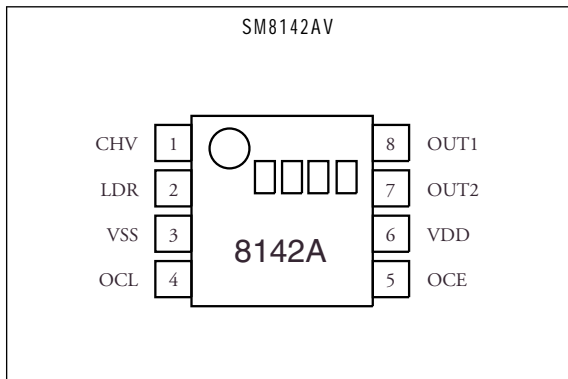


**PACKAGE DIMENSIONS (Unit : mm)**

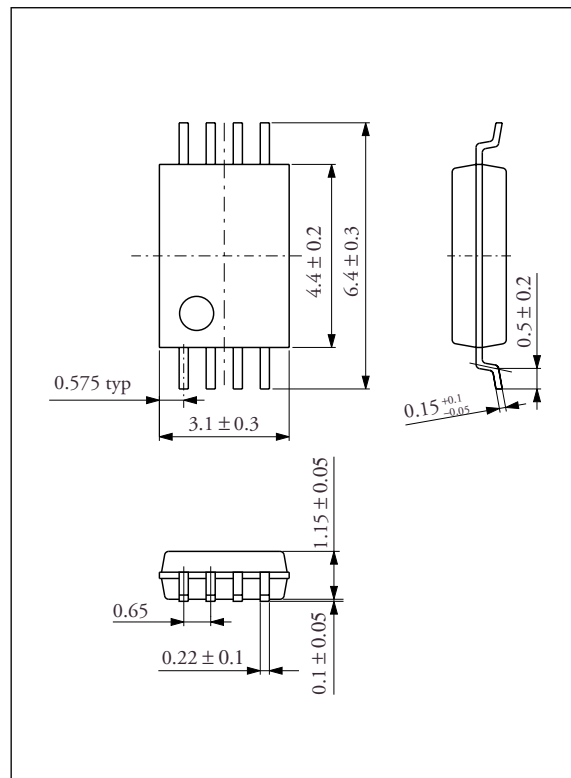
■ 8-pin SON



■ 8-pin VSOP

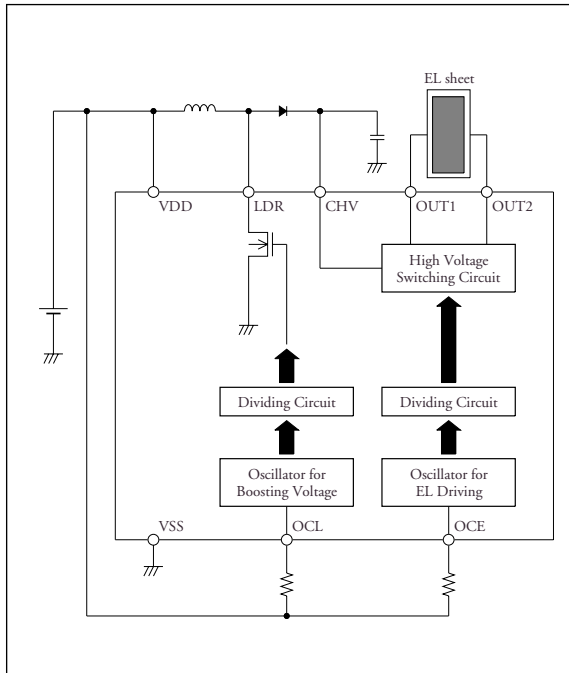


■ 8-pin VSOP

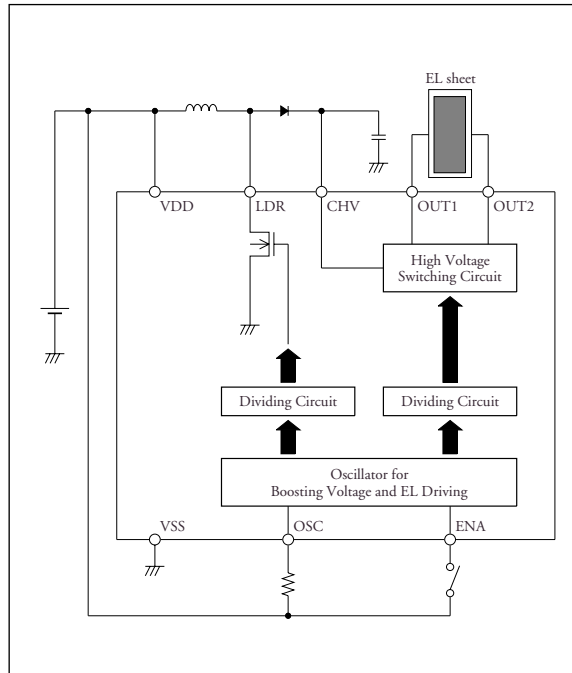


**BLOCK DIAGRAM**

■ SM8142A



■ SM8142B



**PIN DESCRIPTION**

Pin number		Ver.	Name	I / O	Function
VSOP-8	SON-8				
1	7	A/B	CHV	I	High-voltage DC input
2	8	A/B	LDR	O	Booster coil driver output
3	1	A/B	VSS	-	Ground
4	2	A	OCL	I	Coil driver oscillator (oscillator frequency determined by external resistor)
		B	OSC	I	Coil and EL driver oscillator (oscillator frequency determined by external resistor)
5	3	A	OCE	I	EL driver oscillator (oscillator frequency determined by external resistor)
		B	ENA	Ip <sup>1</sup>	Enable input (HIGH: enable, LOW: disable)
6	4	A/B	VDD	-	Supply
7	5	A/B	OUT2	O	Output 2
8	6	A/B	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	$P_D$	$T_a \leq 85^\circ\text{C}$	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 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.

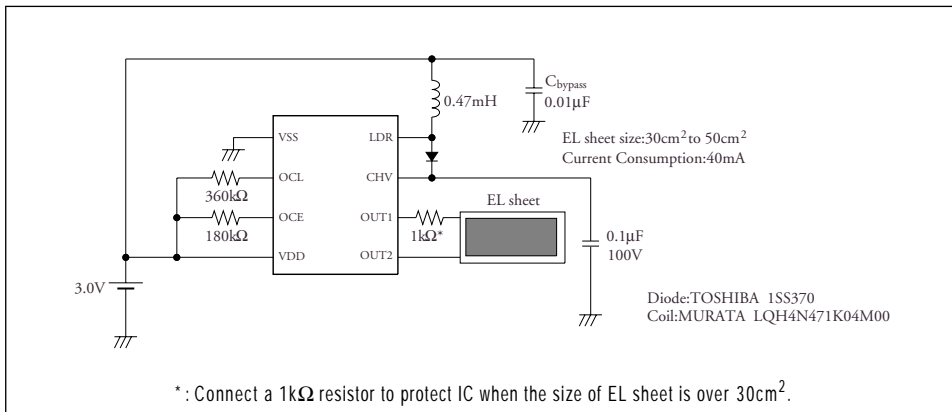
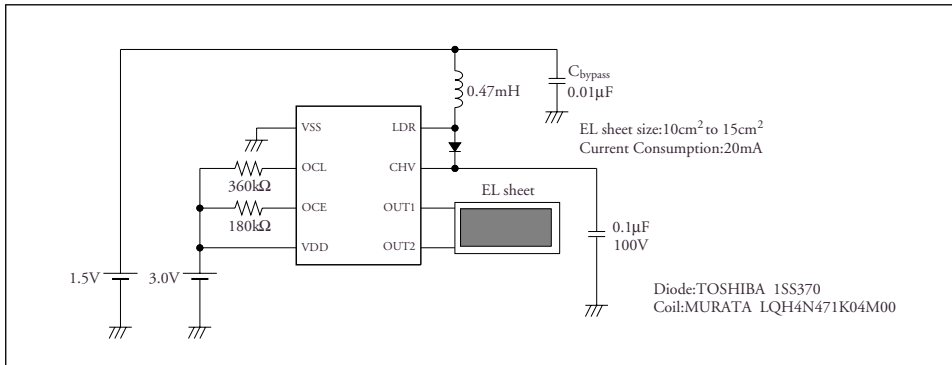
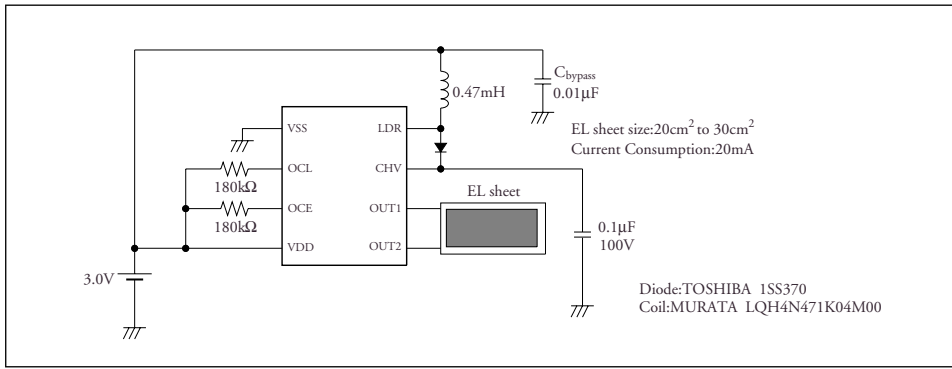
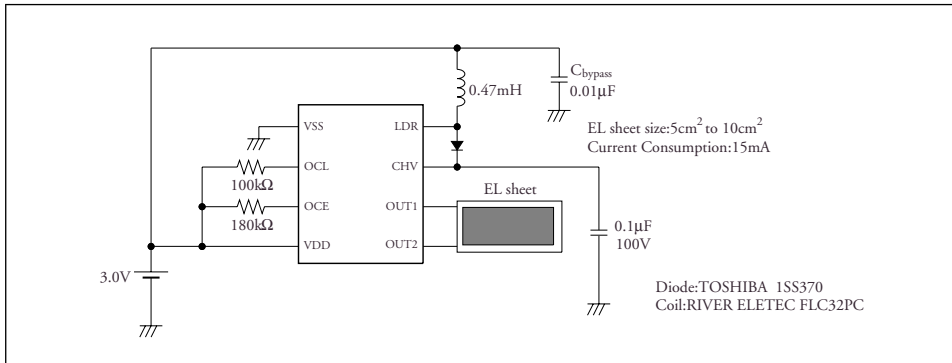
## DC Characteristics

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

Parameter	Ver.	Symbol	Condition	Rating			Unit
				min	typ	max	
Supply voltage	A/B	$V_{DD}$		1.6	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	$f_{OCE1}$	$R_{OCE} = 180\text{ k}\Omega$	205	256	307	kHz
OCE oscillator frequency range		$f_{OCE2}$		32	–	1024	
OCL oscillator frequency	A	$f_{OCL1}$	$R_{OCL} = 180\text{ k}\Omega$	205	256	307	kHz
OCL oscillator frequency range		$f_{OCL2}$		32	–	1024	
OSC oscillator frequency	B	$f_{OSC1}$	$R_{OSC} = 180\text{ k}\Omega$	205	256	307	kHz
OSC oscillator frequency range		$f_{OSC2}$		32	–	1024	
OUT1, OUT2 output frequency	A/B	$f_{OUT1}$	$R_{OCE}/R_{OSC} = 180\text{ k}\Omega$	200	250	300	Hz
OUT1, OUT2 output frequency range		$f_{OUT2}$		31	–	1000	
LDR inductance driver frequency	A/B	$f_{LDR1}$	$R_{OCL}/R_{OSC} = 180\text{ k}\Omega$	51	64	77	kHz
LDR inductance driver frequency range		$f_{LDR2}$		8	–	256	
ENA HIGH-level input voltage	B	$V_{ENAH}$	ENA = "H", $V_{DD} = 1.6\text{ to }5.5\text{ V}$	$V_{DD} - 0.5$	–	$V_{DD} + 0.3$	V
ENA LOW-level input voltage		$V_{ENAL}$	ENA = "L", $V_{DD} = 1.6\text{ to }5.5\text{ V}$	$V_{SS} - 0.3$	–	$V_{SS} + 0.5$	
ENA input current	B	$I_{ENAH}$	$V_{ENAH} = V_{DD} = 3.0\text{ V}$	2.0	4.0	6.0	$\mu\text{A}$
Operating current	A/B	$I_{DD1}$	Excluding coil current	–	–	0.5	mA
Stand-by current	B	$I_{STB}$	ENA = "L"	–	–	1.0	$\mu\text{A}$

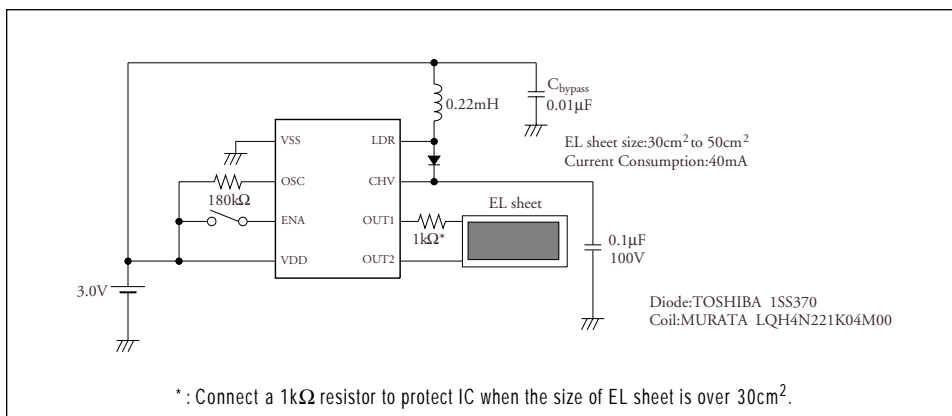
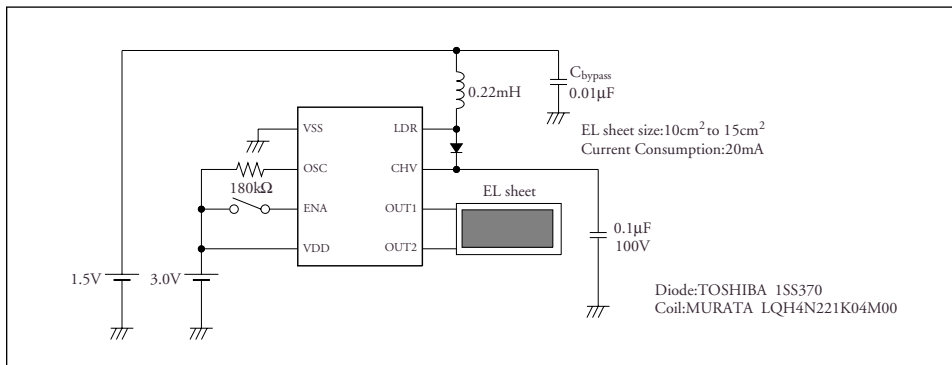
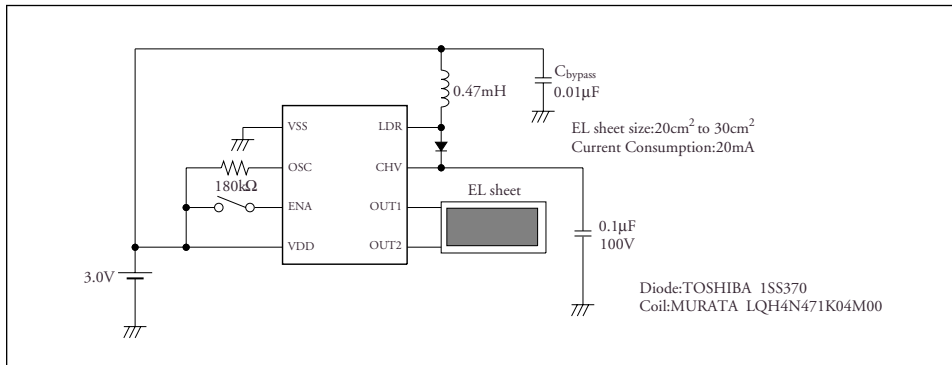
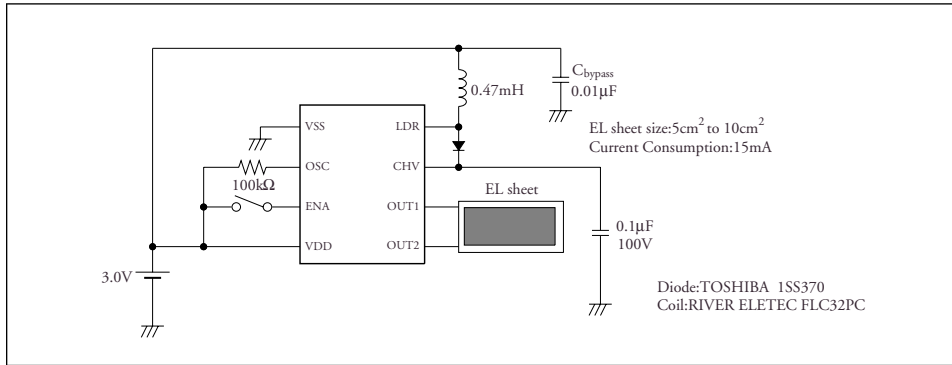
TYPICAL APPLICATIONS

■ SM8142AD



Note: Do not operate the SM8142 with the EL sheet NOT connected (no load to OUT1/OUT2) since the IC will be damaged.

■ SM8142BD



\*: Connect a 1kΩ resistor to protect IC when the size of EL sheet is over 30cm<sup>2</sup>.

Note: Do not operate the SM8142 with the EL sheet NOT connected (no load to OUT1/OUT2) since the IC will be damaged.

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