

OVERVIEW

The SM8142 is a transformer-less electroluminescent (EL) driver IC, capable of driving sheets up to 30cm² 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

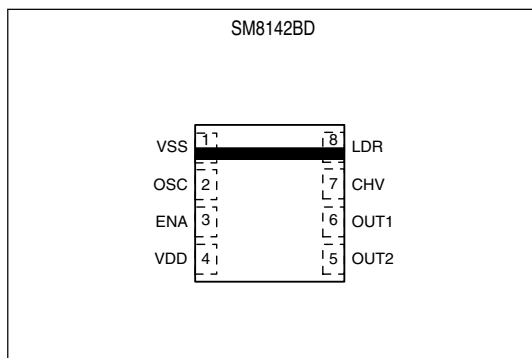
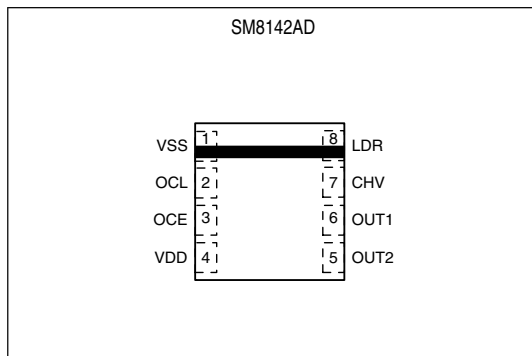
- Dedicated EL driver
- Noise-less smooth drive waveform
- High-efficiency output circuit
- Two oscillator circuits built-in (SM8142A)
- Stand-by function (SM8142B)
- Stable temperature characteristics
- Ultra-small package
- 1.6 to 5.5V supply voltage
- 0.3mA typ. ($V_{DD} = 3.0V$) current consumption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

ORDERING INFORMATION

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

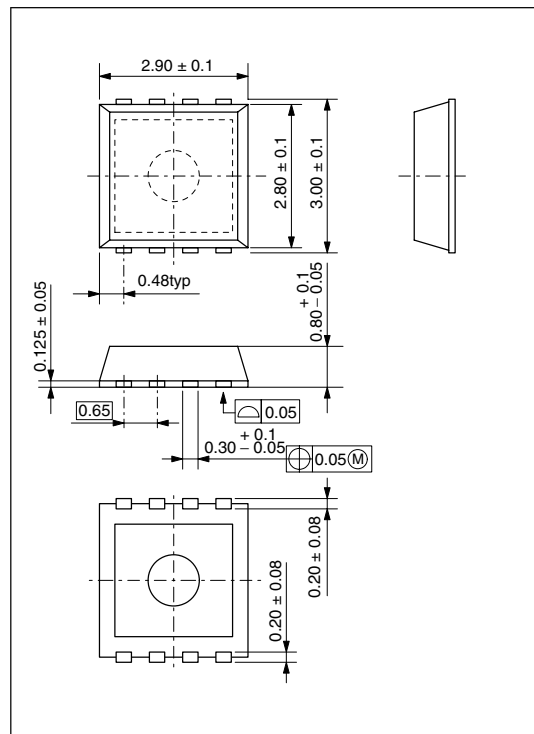
PINOUT (Top view)

■ 8-pin SON

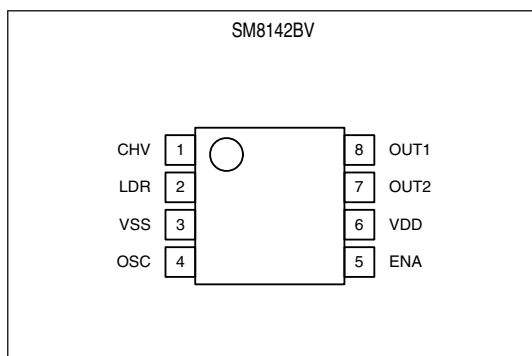
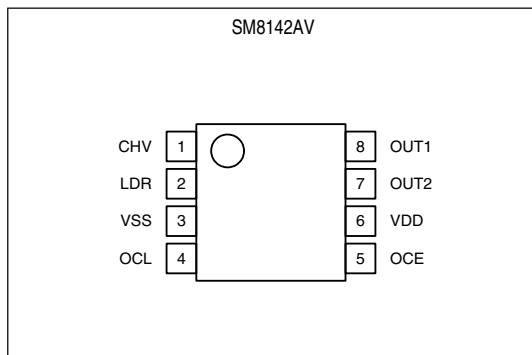


PACKAGE DIMENSIONS (Unit: mm)

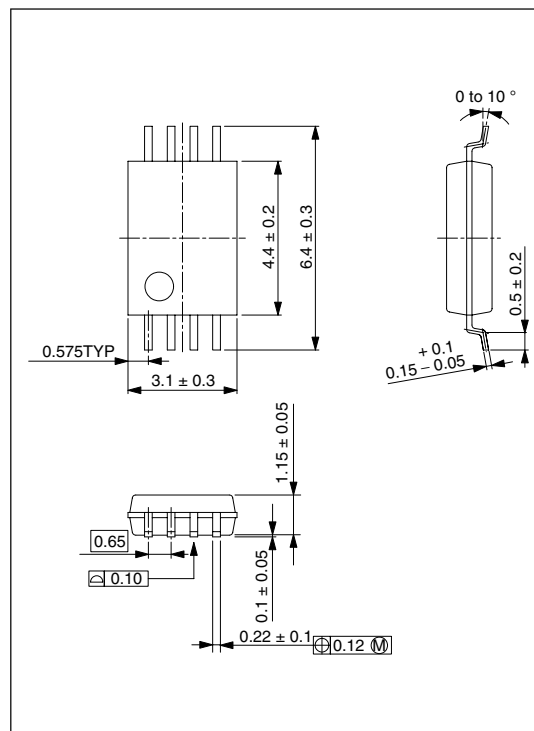
■ 8-pin SON



■ 8-pin VSOP

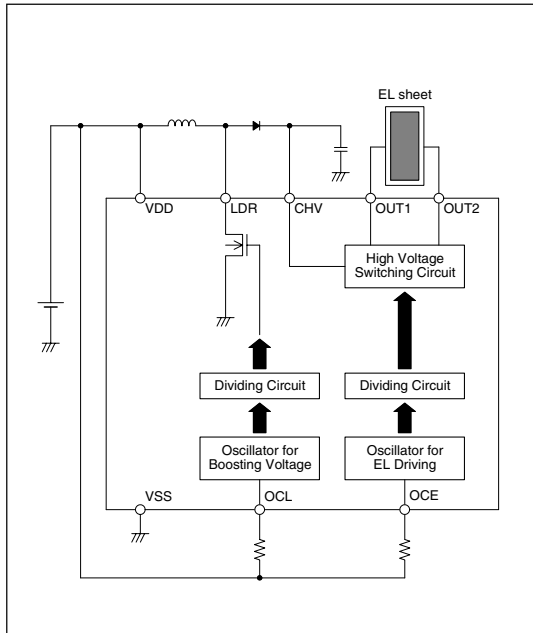


■ 8-pin VSOP

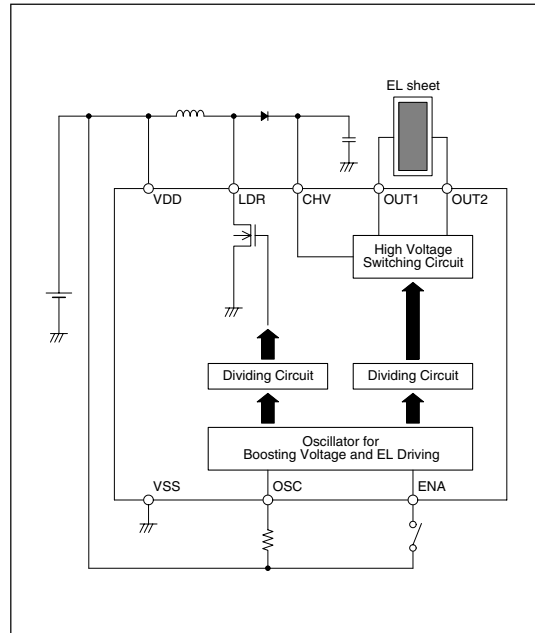


BLOCK DIAGRAM

■ 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 ¹	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 ¹	I_{DD2}	Including coil current, $V_{DD} = 3.0\text{V}$	-	-	60	mA
		Including coil current, $V_{DD} = 5.0\text{V}$	-	-	36	
Current limit resistance	R_{CHV}	$V_{DD} = 1.6$ to 4.0V	-	0	-	k Ω
		$V_{DD} = 4.0$ to 5.5V	10	20	-	
	R_{OUT}	$EL \leq 30\text{cm}^2$	-	0	-	k Ω
		$EL \geq 30\text{cm}^2$	-	1.0	-	
Coil inductance	L_{LDR}	$f_{LDR} = 64\text{kHz}$	-	0.47	-	mH

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

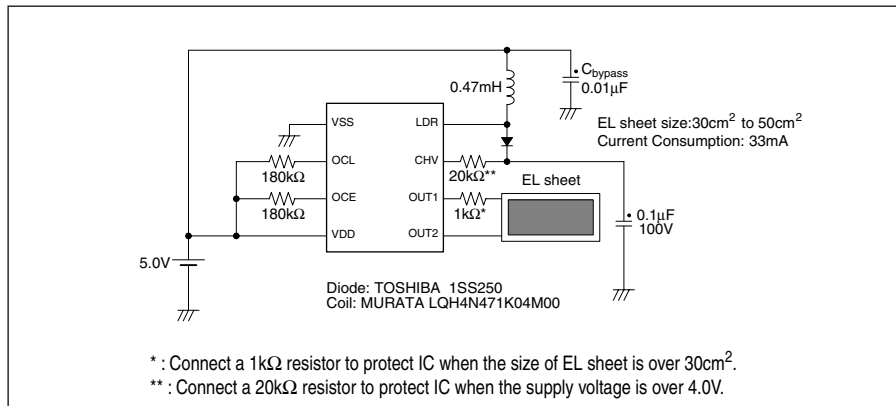
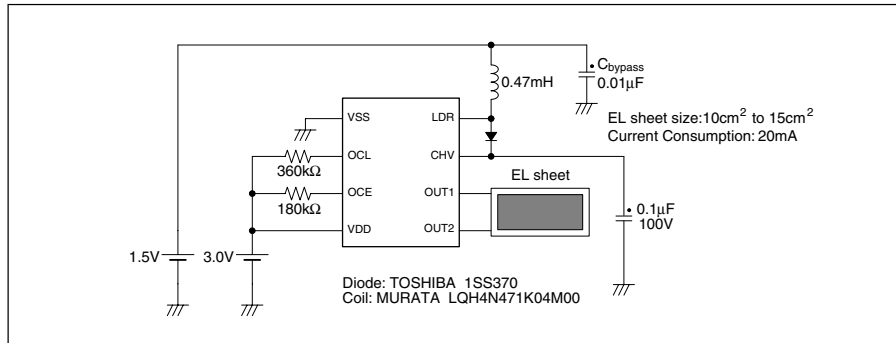
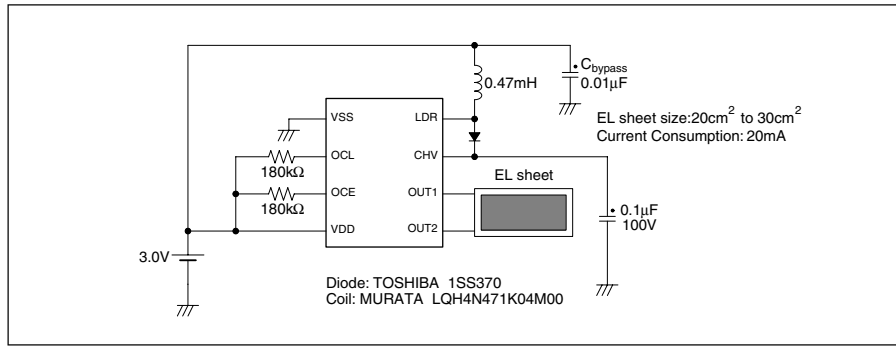
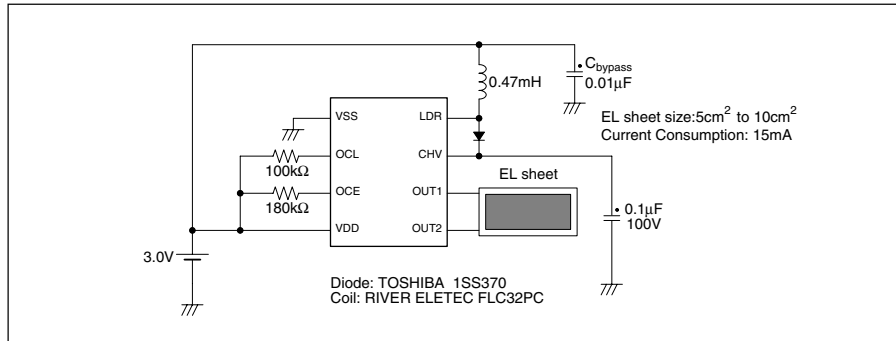
DC Characteristics

$V_{DD} = 3.0V$, $T_a = 25^\circ C$ 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}	$I_{LDR} = 50mA$	–	8.0	12.0	Ω
OCE oscillator frequency	A	f_{OCE1}	$R_{OCE} = 180k\Omega$	205	256	307	kHz
OCE oscillator frequency range		f_{OCE2}		32	–	1024	
OCL oscillator frequency	A	f_{OCL1}	$R_{OCL} = 180k\Omega$	205	256	307	kHz
OCL oscillator frequency range		f_{OCL2}		32	–	1024	
OSC oscillator frequency	B	f_{OSC1}	$R_{OSC} = 180k\Omega$	205	256	307	kHz
OSC oscillator frequency range		f_{OSC2}		32	–	1024	
OUT1, OUT2 output frequency	A/B	f_{OUT1}	$R_{OCE}/R_{OSC} = 180k\Omega$	200	250	300	Hz
OUT1, OUT2 output frequency range		f_{OUT2}		31	–	1000	
LDR inductance driver frequency	A/B	f_{LDR1}	$R_{OCL}/R_{OSC} = 180k\Omega$	51	64	77	kHz
LDR inductance driver frequency range		f_{LDR2}		8	–	256	
ENA HIGH-level input voltage	B	V_{ENAH}	ENA = "H", $V_{DD} = 1.6$ to $5.5V$	$V_{DD} - 0.5$	–	$V_{DD} + 0.3$	V
ENA LOW-level input voltage		V_{ENAL}	ENA = "L", $V_{DD} = 1.6$ to $5.5V$	$V_{SS} - 0.3$	–	$V_{SS} + 0.5$	
ENA input current	B	I_{ENAH}	$V_{ENAH} = V_{DD} = 3.0V$	2.0	4.0	6.0	μA
Operating current	A/B	I_{DD1}	Excluding coil current	–	–	0.5	mA
Stand-by current	B	I_{STB}	ENA = "L"	–	–	1.0	μA

TYPICAL APPLICATIONS

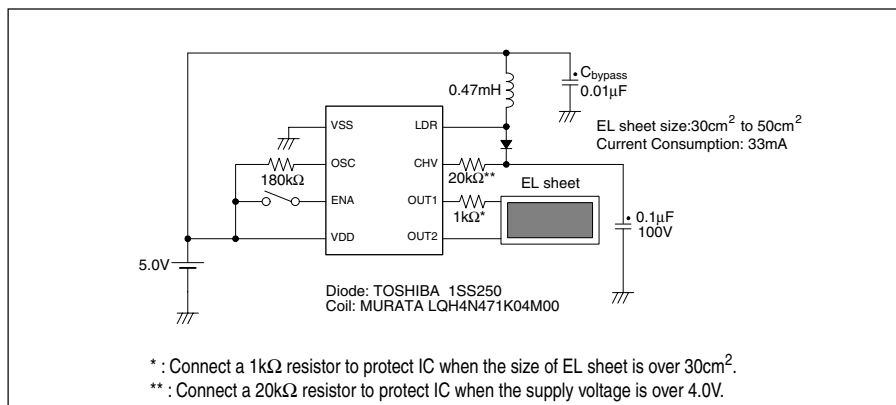
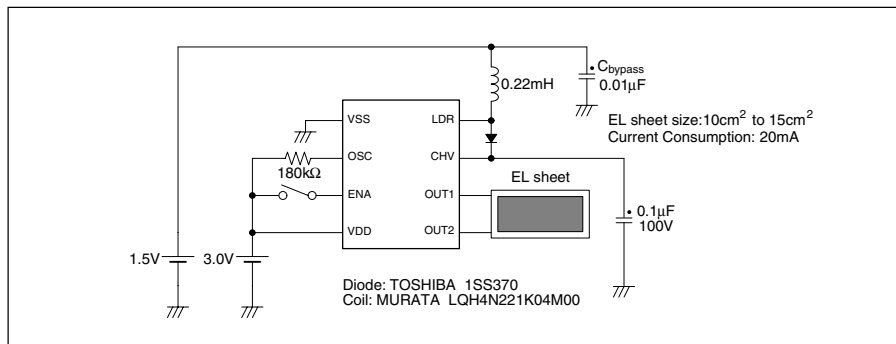
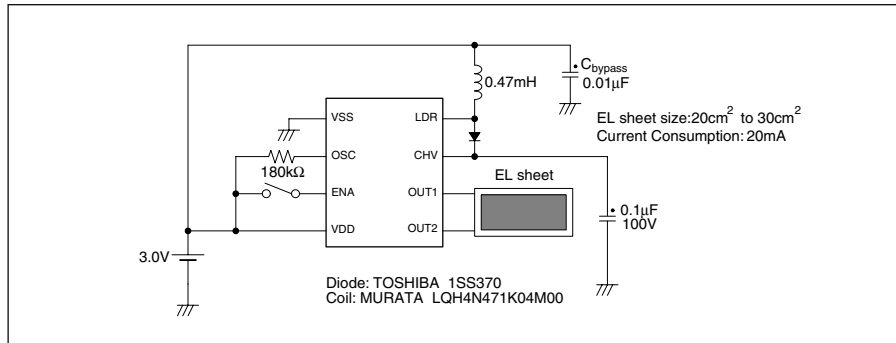
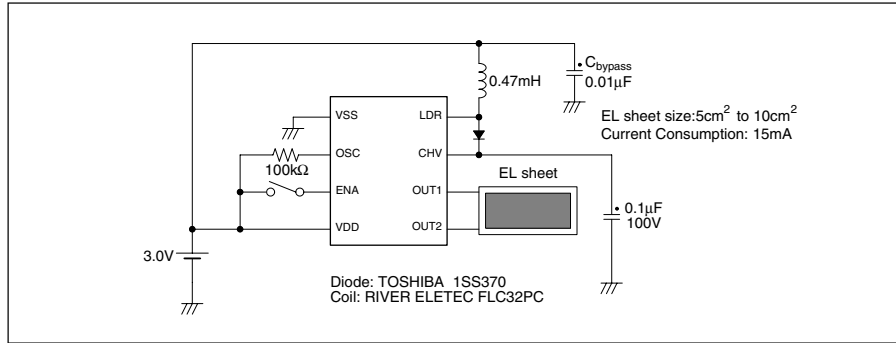
■ SM8142AD



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

SM8142

■ SM8142BD



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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