OVERVIEW

The SM8142B is a transformer-less electroluminescent (EL) driver IC, capable of driving sheets up to 30cm^2 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.

* : SM8142BD

FEATURES

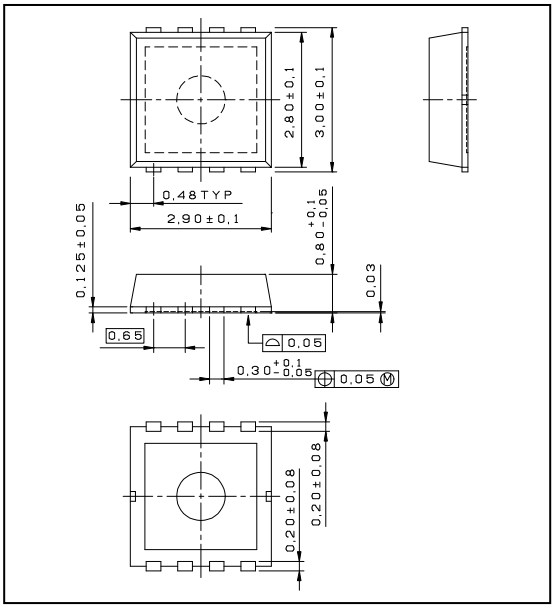
- Dedicated EL driver
- Noise-less smooth drive waveform
- High-efficiency output circuit
- Stand-by function
- Stable temperature characteristics
- Ultra-small package
- 1.6 to 5.5V supply voltage
- 0.3mA typ. (V_{DD}=3.0V) current consumption (excluding coil current)
- 200V_{P-P} maximum EL driver voltage
- 31 to 1000Hz EL driver frequency range
- 220µH minimum coil inductance

ORDERING INFORMATION

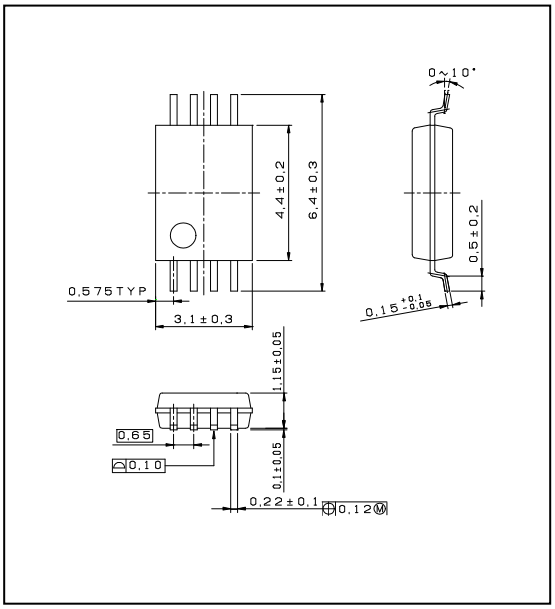
Device	Package
SM8142BD	8 pin SON
SM8142BV	8 pin VSOP

PACKAGE DIMENSIONS (Unit : mm)

- 8-pin SON

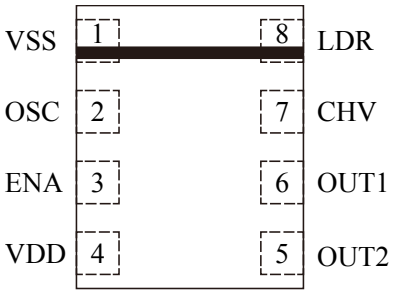


- 8-pin VSOP

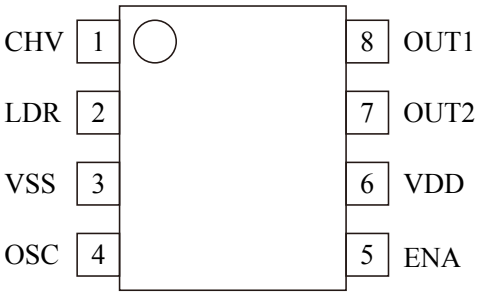


PINOUT (Top view)

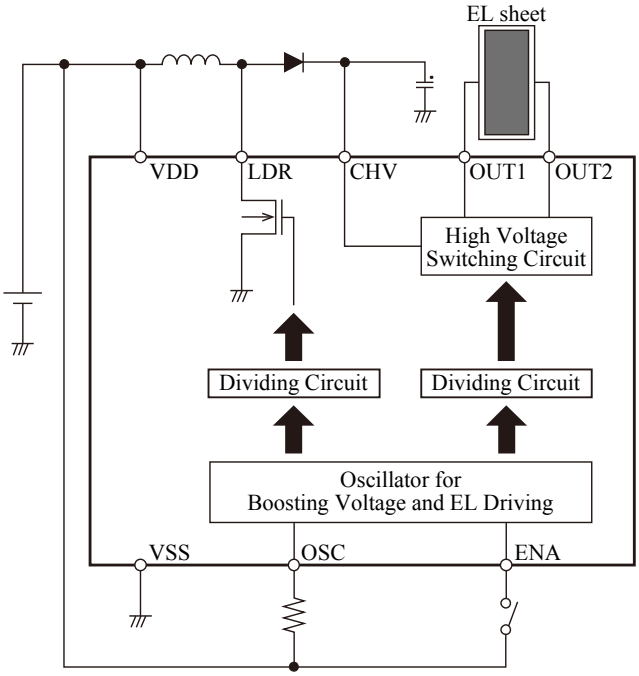
▪ 8-pin SON



▪ 8-pin VSOP



BLOCK DIAGRAM



PIN DESCRIPTION

Pin number		Name	I/O	Function
VSOP-8	SON-8			
1	7	CHV	I	High-voltage DC input
2	8	LDR	O	Booster coil driver output
3	1	VSS	-	Ground
4	2	OSC	I	Coil and EL driver oscillator (oscillator frequency determined by external resistor)
5	3	ENA*1	I	Enable input (High : enable, Low : disable)
6	4	VDD	-	Supply
7	5	OUT2	O	Output 2
8	6	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(CHV)	V_{CHV}	CHV pin	0.5 to 120	V
Output voltage(LDR)	V_{LDR}	LDR pin	0.5 to 120	V
Output voltage(OUT1/2)	$V_{OUT1/2}$	OUT1,OUT2 pin	0.5 to 120	V
Power dissipation	P_D	Ta≤85℃	100	mW
Storage temperature range	T_{STG}		-55 to +125	°C

Note. The device may be damaged or deteriorated if any of the above parameter ratings is exceeded.

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	℃
Operating current	I_{DD2}	Including coil current, V_{DD}=3.0V		-	-	60[*1]	mA
		Including coil current, V_{DD}=5.0V		-	-	36[*1]	
Current limit resistance	R_{CHV}	V_{DD}≤4.0V		0	-	-	kΩ
		V_{DD}>4.0V		20	-	-	
	R_{OUT}	V_{DD}≤4.0V	EL Size ≤30cm^2	0	-	-	kΩ
			EL Size >30cm^2	1.0	-	-	
		V_{DD}>4.0V	EL Size ≤30cm^2	0	-	1.0	
			EL Size >30cm^2	1.0[*2]	-	1.0[*2]	
Coil inductance	L_{LDR}	f_{LDR}=64kHz		-	470	-	μH

*1. When it is designed, these ratings should not be exceeded, including device variations.
*2. These values should be fixed at 1.0kΩ.

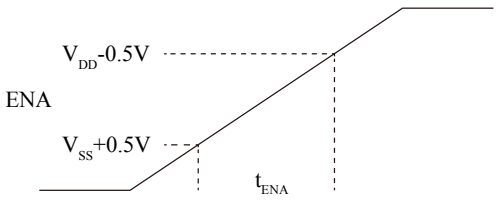
DC Characteristics

V_{DD}=3.0V, Ta=25°C unless otherwise noted.

Parameter	Pin	Symbol	Condition	Rating			Unit
				MIN	TYP	MAX	
Supply voltage	VDD	V_{DD}		1.6	3.0	5.5	V
Output voltage	CHV	V_{CHV}		0.5	-	100	V
	OUT1/2	V_{OUTH}		-	-	100	V
	OUT1/2	V_{OUTL}		-	-	0.5	V
Output resistance	LDR	R_{LDR}	I_{LDR}=50mA	-	8.0	12.0	Ω
Oscillator frequency	OSC	f_{OSC1}	R_{OSC}=180kΩ	205	256	307	kHz
Oscillator frequency range		f_{OSC2}		32	-	1024	kHz
Output frequency*1	OUT1/2	f_{OUT1}	R_{OSC}=180kΩ	200	250	300	Hz
Output frequency range		f_{OUT2}		31	-	1000	Hz
Inductance driver frequency*1	LDR	f_{LDR1}	R_{OSC}=180kΩ	51	64	77	kHz
Inductance driver frequency range		f_{LDR2}		8	-	256	kHz
HIGH-level input voltage	ENA	V_{ENAH}	ENA="H" V_{DD}=1.6 to 5.5V	V_{DD}-0.5	-	V_{DD}+0.3	V
LOW-level input voltage		V_{ENAL}	ENA="L" V_{DD}=1.6 to 5.5V	V_{SS}-0.3	-	V_{SS}+0.5	V
Input current	ENA	I_{ENAH}	V_{ENAH}=V_{DD}=3.0V	2.0	4.0	6.0	µA
Rise time*2	ENA	t_{ENA}	V_{ENAL}→V_{ENAH}	-	-	100	ms
Operating current	VDD	I_{DD1}	Excluding coil current	-	-	0.5	mA
Stand-by current	VDD	I_{STB}	ENA="L"	-	-	1.0	µA

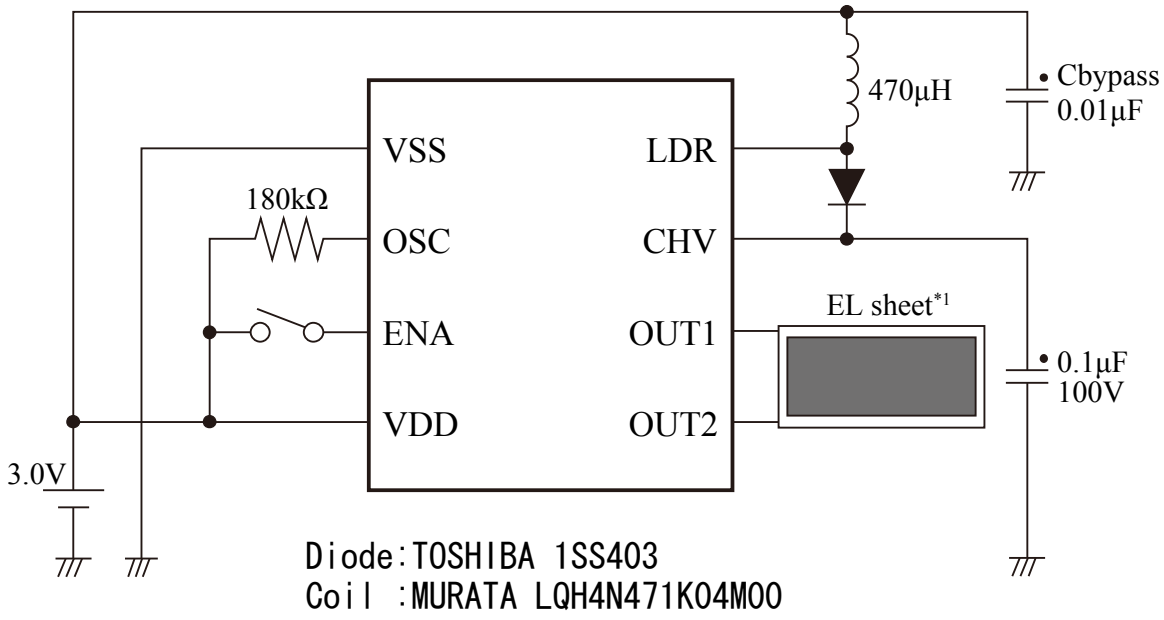
*1. Output frequency=(1/256)×Inductance driver frequency

*2. Rise time

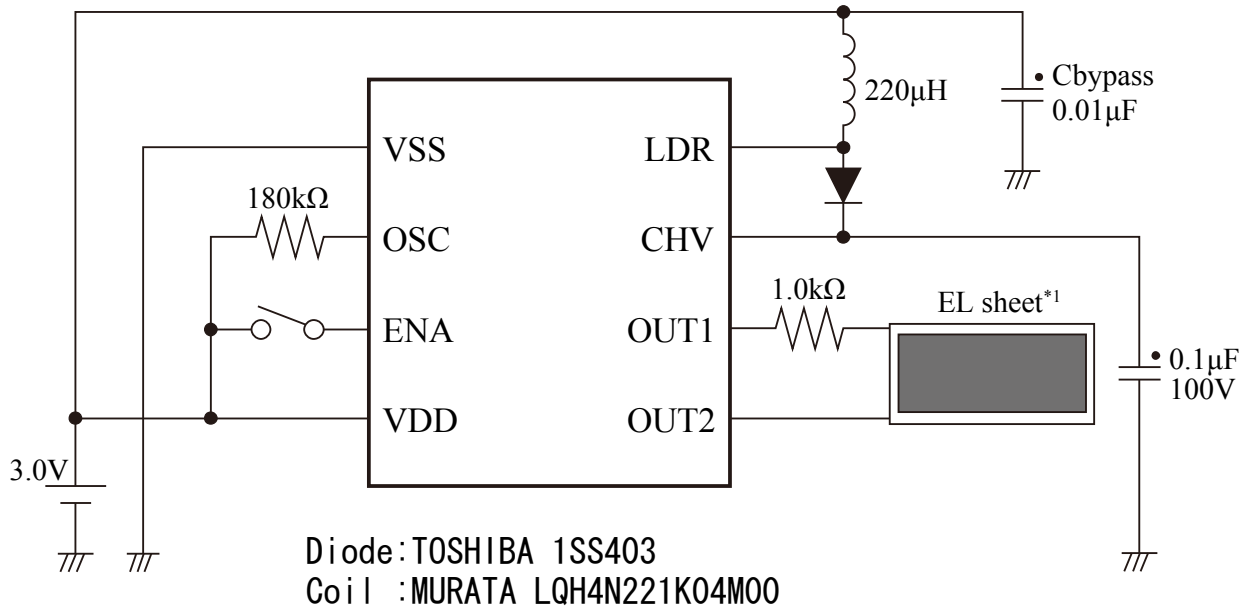


TYPICAL APPLICATIONS

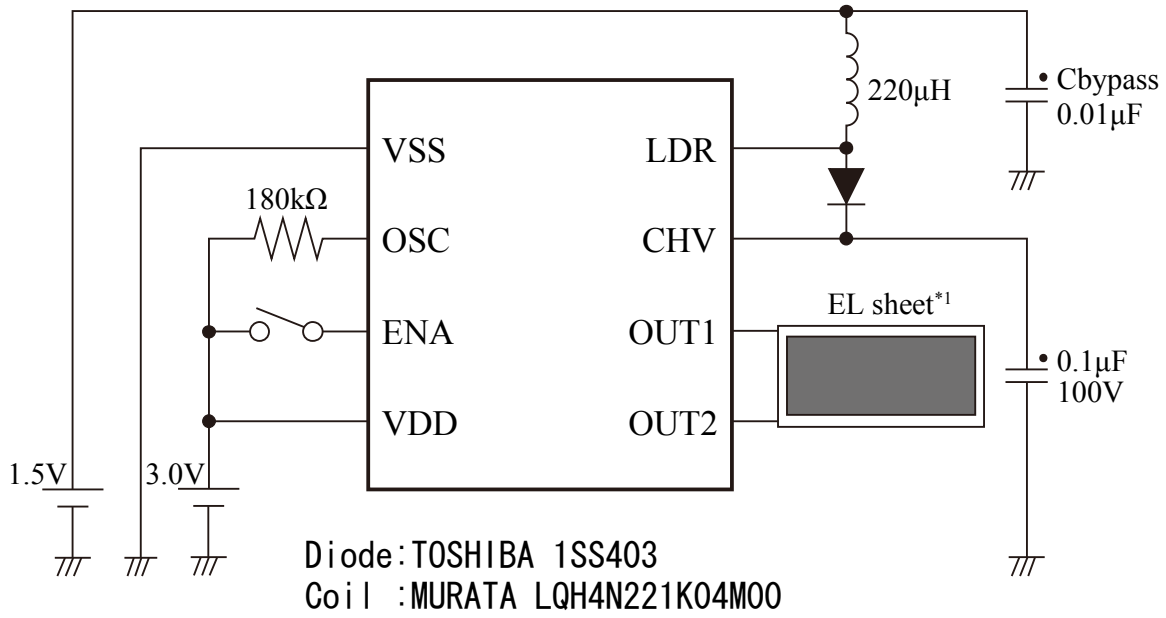
(1) EL sheet size : 20 to 30cm^2
Current consumption : 20mA



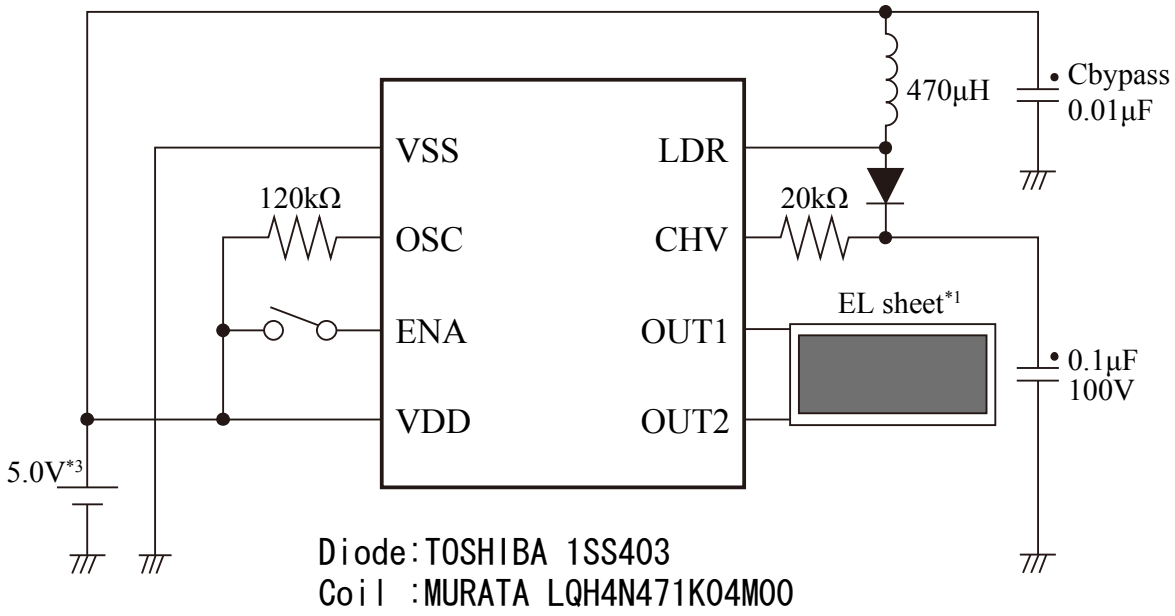
(2) EL sheet size : 30 to 50cm^2 *2
Current consumption : 40mA



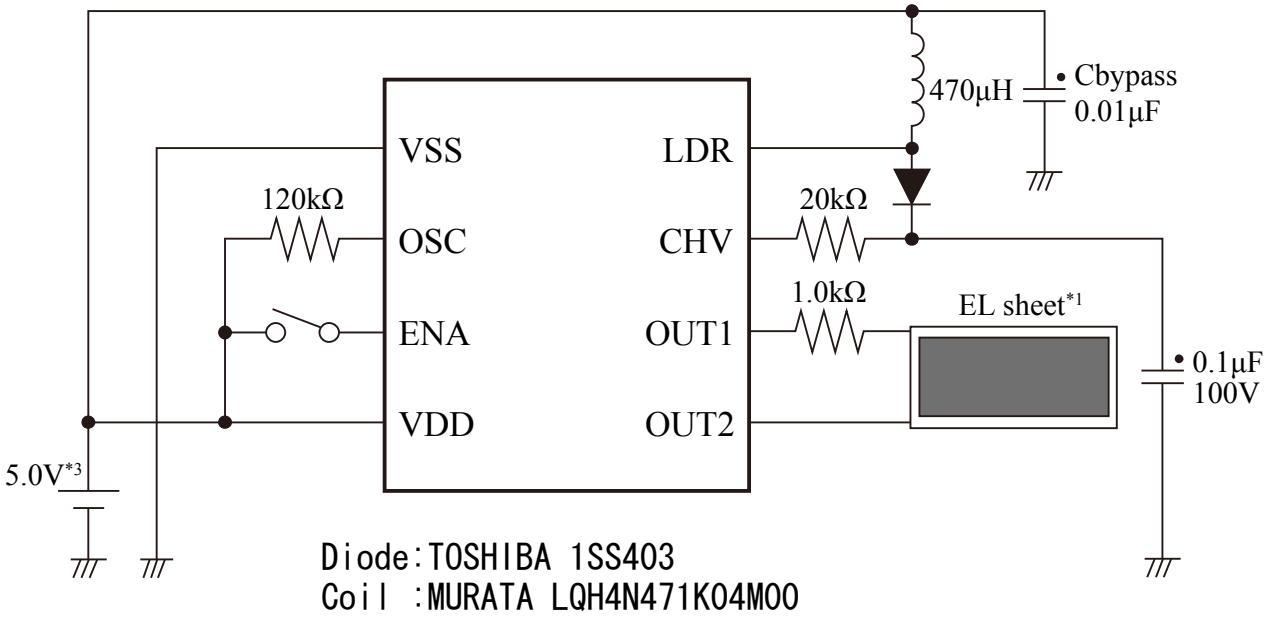
(3) EL sheet size : 10 to 15cm^2
Current consumption : 20mA



(4) EL sheet size : 10 to 20cm^2
Current consumption : 26mA



(5) EL sheet size : 30 to 50 cm^{2} *2
Current consumption : 34mA



*1. Do not operate the IC with the EL sheet NOT connected (no load to OUT1/OUT2) since the IC will be damaged.
*2. If the EL sheet size is exceeded 30cm^{2}, connect a 1.0kΩ resistor between the EL sheet and the OUT1 pin.
*3. When the supply voltage is exceeded 4.0V, connect a 20kΩ resistor to CHV for current limit, and the OUT1 pin resistor is set 1.0kΩ (EL sheet size>30cm^{2}) or 1.0kΩ or less (EL sheet size≤30cm^{2}).

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