FEATURES

- 2.4V ~ 7.0V Power supply.
- Low shutdown current at 0.1uA (Typical).
- Low quiescent current at 90.0uA (Typical).
- Adjustable Output Voltage to -40V.
- 60KHz ~ 160KHz Switching Frequency.
- High Efficiency with Low Cost External PNP Bipolar Transistor.
- Pulse Frequency Modulation Maintains High Efficiency (80%).
- Lead free and green package available. (RoHS Compliant)
- Space Saving Package：
  - 8-pin SOP package.

GENERAL DESCRIPTION

The LY1152 is a high performance inverting DC/DC controller, and the LY1152 designed to drive an external power switch to generate adjustable negative voltages. Output voltage can be scaled to -40V.

The LY1152 quiescent current is about 90.0uA and shutdown mode current can be reduced to 0.1uA. In the LCD bias contrast application, efficiency of 80% can be achieved with low cost PNP bipolar transistor drivers.

The LY1152 switching frequency can be around 60KHz to 160KHz range, and small size package is ideally suited for powered portable equipments.

APPLICATION

- Negative Voltage Supply.
- Negative LCD Contrast Bias for
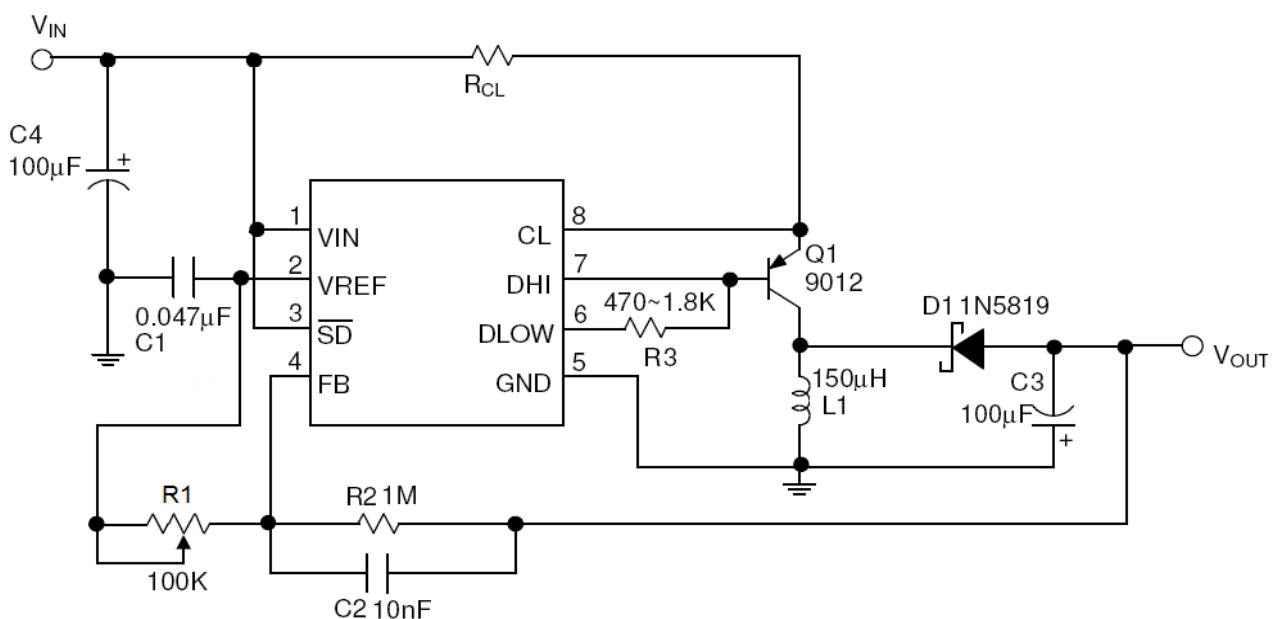 - Portable Data Collection Terminals.
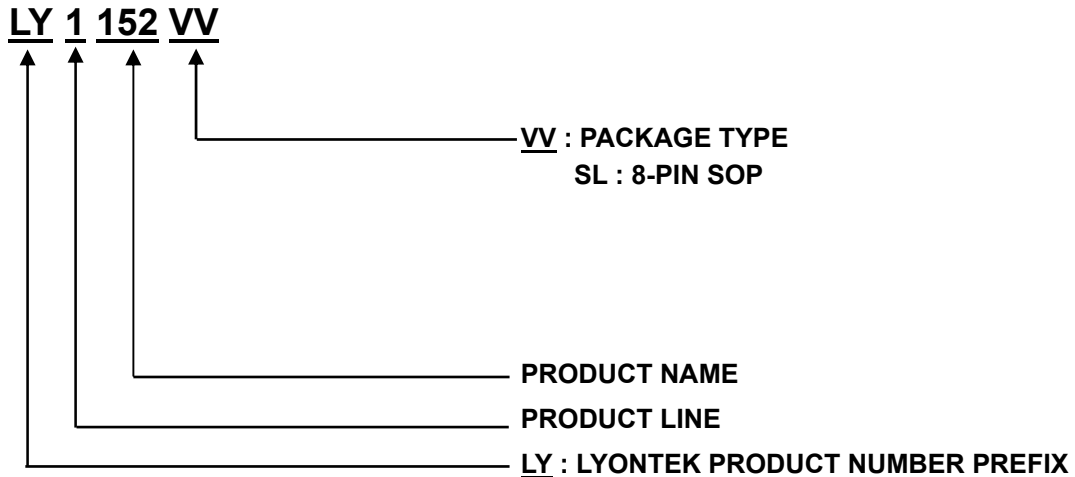 - Notebook Computers.

PIN CONFIGURATION

LY1152 SOP8 (Top View)

1 VIN	8 CL
2 VREF	7 DHI
3 SHUTDOWN	6 DLOW
4 FB	5 GND
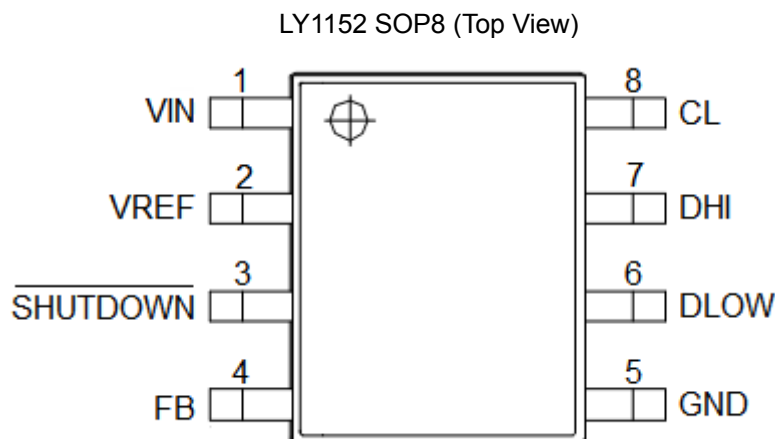
PIN DESCRIPTION

SYMBOL	PIN NO	DESCRIPTION
VIN	1	Power supply input
VREF	2	Reference output (1.22V).[*1]
SHUTDOWN	3	Shutdown the device.(when low level is enable)[*2]
FB	4	Feedback signal input to sense ground.[*3]
GND	5	Ground.
DLOW	6	Driver sinking output.[*4]
DHI	7	Driver sourcing output.[*5]
CL	8	Current-limit input.[*6]

(*1)：Bypass with 0.047uF capacitor to GND, Sourcing capability is guaranteed to be greater than 250uA.

(*2)：>1.5V = operation mode, GND = shutdown, In shutdown mode DLOW and DHI pins are at high level.

(*3)：Connecting a resistor R2 to V_{OUT} and a resistor R1 to V_{REF} pin yields the output voltage:

$V_{OUT} = -(R2/R1) \times V_{REF}$

PS: recommend R1 and R2 use 1% precision resistors to get accurate V_{out} voltage.

(*4)：When using an external PNP bipolar transistor, connect a resistor R3 from this pin to DHI. R3 value depends on V_{IN}, inductor and PNP bipolar transistor. By adjusting the R3 value, efficiency can be optimized.

(*5)：Connect to base of the PNP bipolar transistor.

(*6)：This pin clamps the switch peak current to prevent over-current damage to the external switch.
The R_{CL} resistor equation:
R = V / I = 100mV(CL Threshold) / 100mA(the current(100mA) depend on user)
R= 1Ω, (so the R_{CL} resistor use 1Ω).

APPLICATION CIRCUIT

Figure 1. Application schematic for negative LCD contrast BIOS power supply

Lyontek Inc. reserves the rights to change the specifications and products without notice.
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ORDERING INFORMATION

LY 1 152 VV

VV : PACKAGE TYPE
SL : 8-PIN SOP

PRODUCT NAME

PRODUCT LINE

LY : LYONTEK PRODUCT NUMBER PREFIX

ABSOLUTE MAXIMUM RATINGS*

PARAMETER	SYMBOL	RATING	UNIT
Supply Voltage	V_{DD}	7.0	V
Operating Temperature	T_A	-40 to 85 (I grade)	℃
Storage Temperature	T_{STG}	-65 to 150	℃
Junction Temperature	T_{JMAX}	125	℃
Soldering Temperature (under 10 sec)	T_{SOLDER}	260	℃

ELECTRICAL CHARACTERISTICS

Refer to Typical Application Circuit.

PARAMETER	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input voltage	-	2.4	-	7.0	V
Quiescent Current	V_{FB} = -50mV	-	90	-	uA
Shutdown Current	$V_{SHUTDOWN}$ = 0V	-	0.1	1.0	µA
Shutdown Threshold	-	-	1.5	-	V
CL Threshold	-	-	100	-	mV
V_{REF} Voltage		1.20	1.22	1.24	V
Vout Voltage	Vout= -(R2/R1) x V_{REF}	0.98xVout	Vout[*7]	1.02xVout	V
V_{REF} Source Current	-	250	-	-	uA

(*7)：**Recommend R1 and R2 using 1% precision resistors to get accurate V$_{out}$ voltage ;**
V$_{REF}$ and V$_{out}$ spec. are specified by the data of production tester (V$_{IN}$=5.0V, T$_A$=25℃).

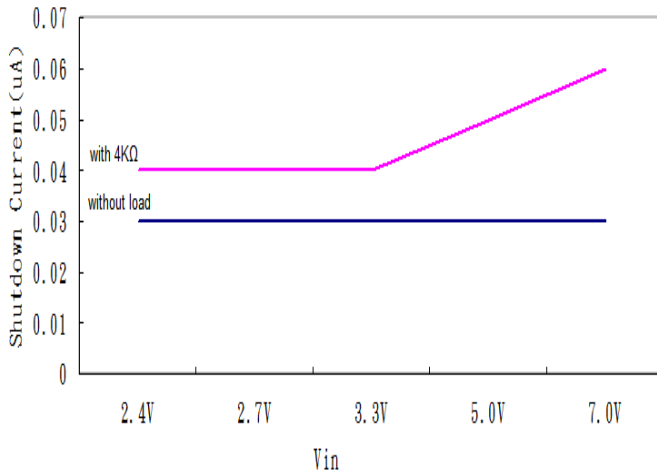## TYPICAL PERFORMANCE CHARACTERISTICS
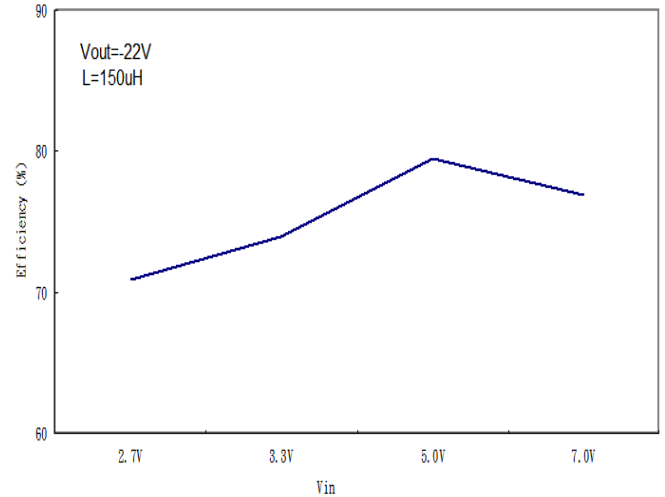

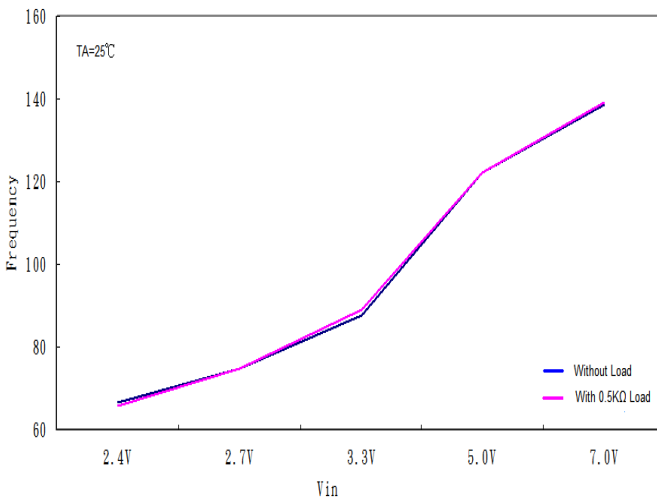Fig.1 Shutdown Current vs Vin

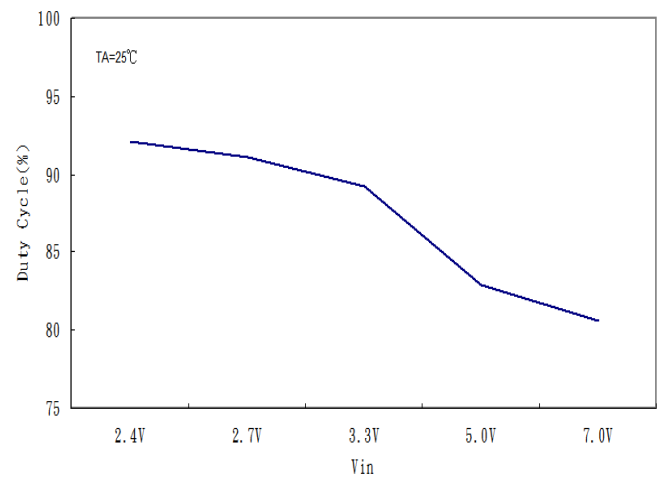Fig.2 Efficiency vs Vin

Fig.3 Frequency vs Vin

Fig.4 Duty Cycle vs Vin

PACKAGE OUTLINE DIMENSION

8-PIN SOP (150 mil) PACKAGE OUTLINE DIMENSION：

SYMBOLS	STANDARD	
	MIN.	MAX.
A	0.053	0.069
A1	0.004	0.010
A2	0.053	0.059
D	0.189	0.196
E	0.150	0.157
H	0.228	0.244
L	0.016	0.050
θ°	0	8

UNIT : INCH