

AN8353UB

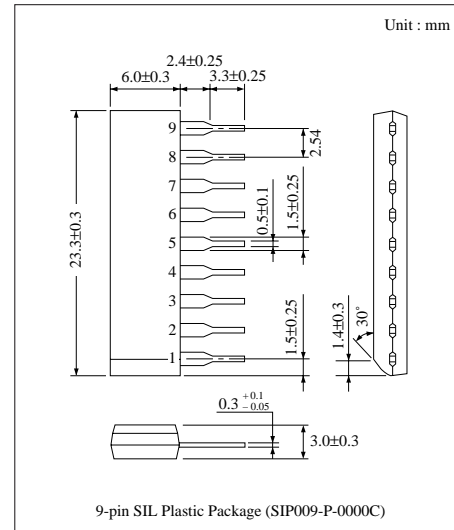
High Efficiency Car Dashboard Dimmer IC

■ Overview

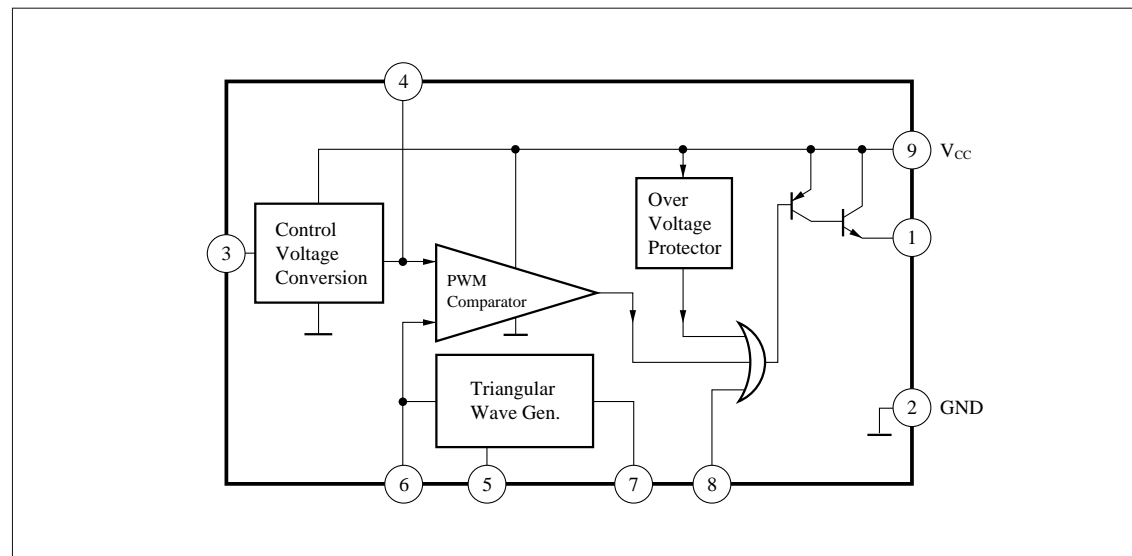
The AN8353UB is a dimmer IC to control illumination of the car dashboard at high efficiency and high performance by pulse width control. It outputs pulses at a duty proportional to an input voltage.

■ Features

- Low power consumption by pulse control
- External ON/OFF control by the standby pin
- Pulse frequency range : 50Hz to 10kHz
- Built-in overvoltage protective circuit approx. 20V
- Wide operating ambient temperature range : -40°C to $+100^{\circ}\text{C}$
- All products temperature cycle, high reliability by normal and high temperature checks reliability equivalent to the air bags requested in U.S.



■ Block Diagram



■ Pin Descriptions

Pin No.	Pin name	Description
1	Output pin	Outputs an intermittent source current at a duty proportional to an input voltage
2	GND	GND
3	Input pin	Applies a control voltage.
4	Noise eliminating capacity connection pin 1	Connect a capacitor to eliminator a noise.
5	Square wave output pin	Output a triangular wave, which serves as a reference for the PWM signal, to the Pin6 by connecting the resistor R_T between the Pins5 and6, and capacity C_T between the Pin6 and GND.
6	Triangular wave output pin	Output a triangular wave, which serves as a reference for the PWM signal, to this pin by connecting the resistor R_T between the Pins6 and 5, and capacity C_T between the Pin6 and GND.
7	Noise eliminating capacity connection pin 2	Connect a capacitor to eliminator a noise.
8	Standby pin	Forces to shut off an output current if a voltage higher than a threshold voltage of 1.1V is applied to the Pin8.
9	V_{CC}	Supply Voltage

■ Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Rating	Unit
Supply voltage	V_{CC}	22	V
Power dissipation	P_D	550	mW
Storage temperature	T_{opr}	-40 to +100	°C
Operating ambient temperature	T_{stg}	-50 to +150	°C

■ Recommended Operating Range (Ta=25°C)

Parameter	Symbol	Range
Operating supply voltage range	V_{CC}	8 to 18V

■ Electrical Characteristics (Ta=25°C)

Parameter	Symbol	Condition	min	typ	max	Unit
Supply current	I_{CC}	Eliminate C_T and R_T	4	7.5	11	mA
Oscillation frequency	f_{osc}	$C_T=0.027\mu F$	90	115	140	Hz
0% duty input voltage	V_{IN-0}	$C_T=0.027\mu F$	2	2.5	3	V
100% duty input voltage	V_{IN-100}	$C_T=0.027\mu F$	9.5	10	10.5	V
Center duty ($V_{CC}=12V$)	D_{12V}	$C_T=0.027\mu F$	35	45	55	%
Center duty ($V_{CC}=8V$)	DD_{8V}	$C_T=0.027\mu F$	-1	0	1	%
Center duty ($V_{CC}=18V$)	DD_{18V}	$C_T=0.027\mu F$	-1	0	1	%
Output duty gain	D_G	$C_T=0.027\mu F$	45	50	55	%
Output voltage at ON	V_{ON}	$C_T=2100pF$	0.6	0.9	1.2	V
Leakage current at OFF	I_L	$C_T=2100pF$	—	0	4	μA
Over voltage detection voltage	V_{OV}	$C_T=2100pF$	18	20	22	V
Standby threshold voltage	V_{STH}	$C_T=2100pF$	0.55	1.1	1.65	V

■ Supplementary Description (cont.)

• System Operational Principle (cont.)

0.2 (B-point) and 0.8 (C-point). The A-point in the figure shows the I/O characteristics when the “input voltage V_3 /supply voltage V_9 ” is 0.7. And, when V_3/V_9 is from 0.05V to about 0.2V (B-point), the duty is controlled to 0%, and when V_3/V_9 is from 0.8V (C-point) to 1.0V, the duty is controlled to 100%.

The standby Pin8 can forcibly turn off the output transistors by applying a voltage of about 1.1V or more to this pin. When it is not necessary to forcibly turn off the output transistors, Leave the standby Pin8 open.

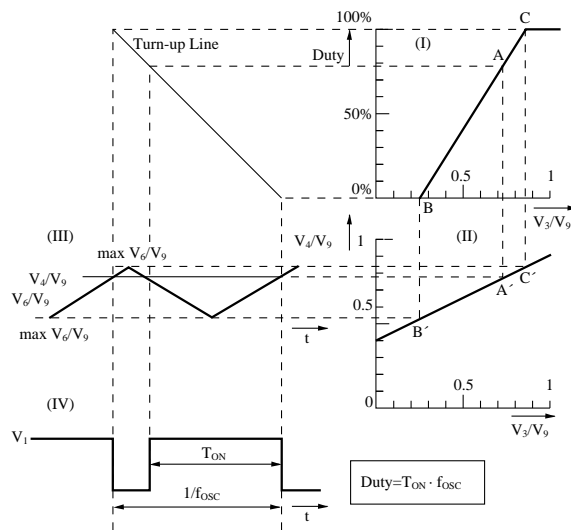


Fig. 2 I/O Characteristic Chart

• Over voltage Detecting Voltage vs. Output

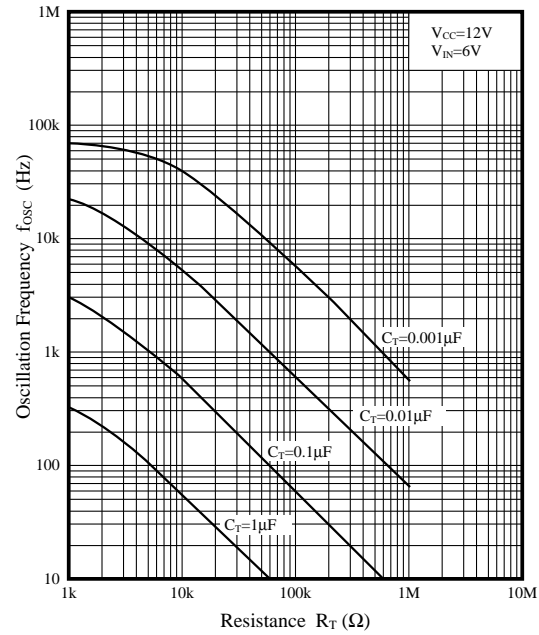
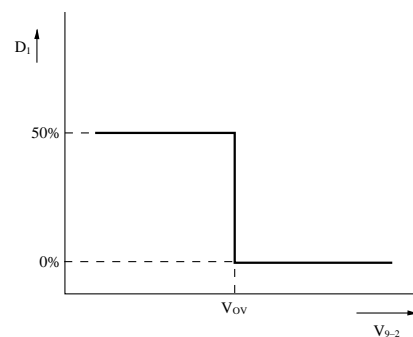
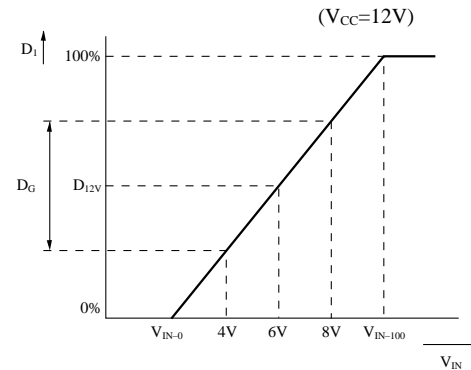


Fig. 3 Relations between Oscillation Frequency and C_T and R_T

• Duty D_1 vs. Input Voltage V_{IN}



• Output voltage at ON V_{ON} · Leakage current at OFF

$$V_{ON} = V_{CC} - V_{1-2} \quad I_L = \frac{V_{1-2}}{1M\Omega}$$

• Standby Threshold Voltage vs. Output

