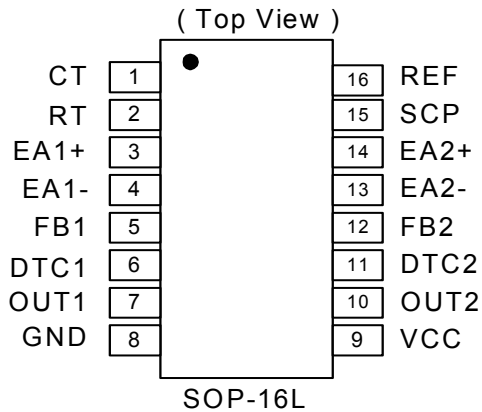


---

**Pin Assignments**

---



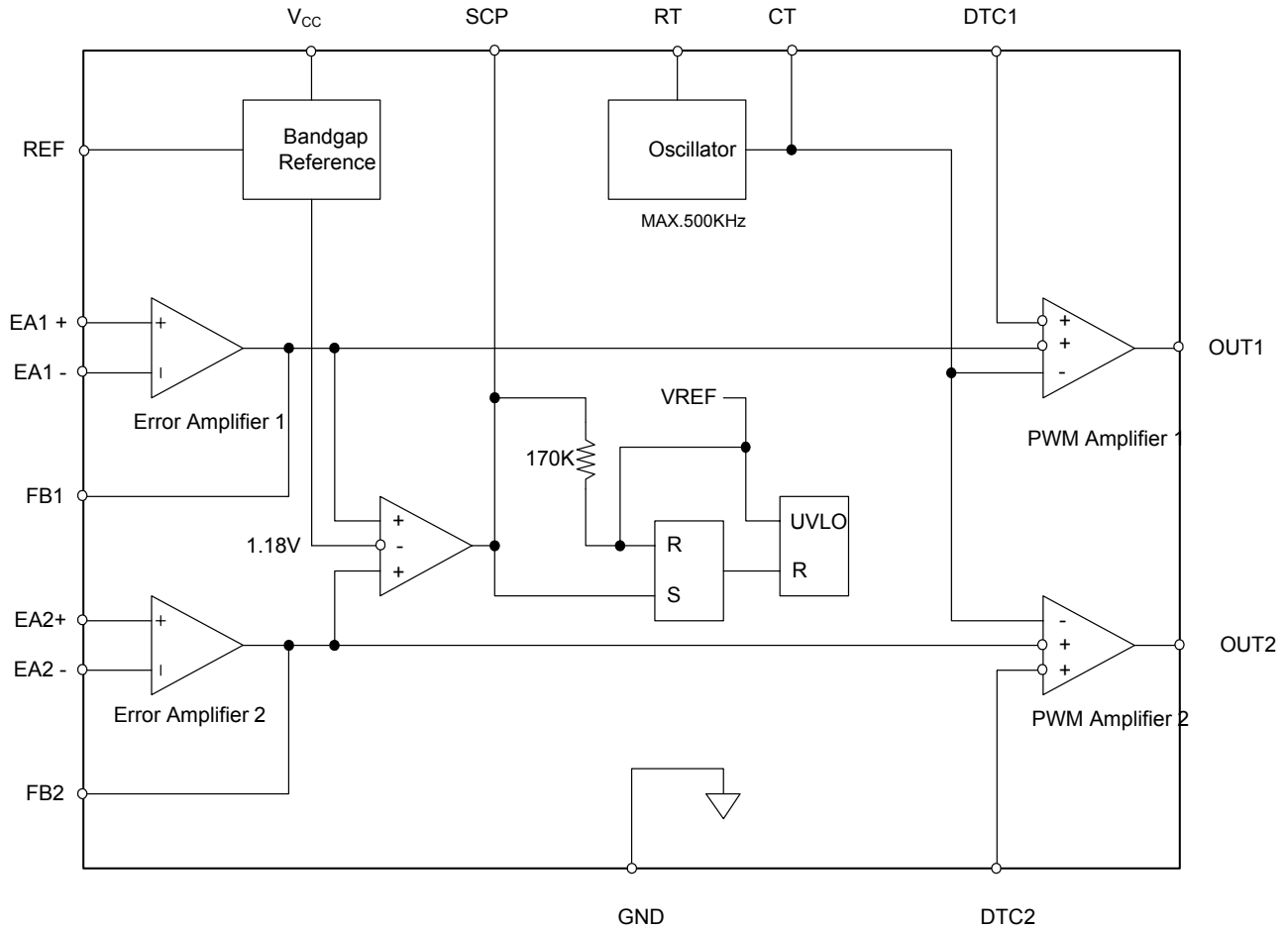
---

**Pin Descriptions**

---

Name	Description
CT	Timing Capacitor
RT	Timing Resistor
EA+	Error Amplifier Input(+)
EA -	Error Amplifier Input(-)
FB	Feedback Loop Compensation
DTC	Dead Time Control
OUT	Pre-driver Output
GND	Ground
VCC	Supply Voltage
SCP	Short Circuit Protection
REF	Voltage Reference

**Block Diagram**



**Absolute Maximum Ratings**

Symbol	Parameter	Rating	Unit
$V_{CC}$	Supply Voltage	40	V
$V_i$	Amplifier Input Voltage	20	V
$V_o$	Collector Output Voltage	40	V
$I_o$	Collector Output Current	21	mA
$T_{OP}$	Operating Temperature Range	-20 to +85	°C
$T_{ST}$	Storage Temperature Range	-65 to +150	°C
$T_{LEAD}$	Lead Temperature 1.6 mm (1/16 inch) from Case for 5 Seconds	245	°C

**Recommended Operating Conditions**

Symbol	Parameter	Min.	Max.	Unit
$V_{CC}$	Supply Voltage	3.6	40	V
$V_I$	Amplifier Input Voltage	1.05	1.45	V
$V_O$	Collector Output Voltage		40	V
$I_O$	Collector Output Current		20	mA
$I_{FB}$	Current into Feedback Terminal		45	$\mu$ A
$R_F$	Feedback Resistor	100		k $\Omega$
$C_T$	Timing Capacitor	150	15000	pF
$R_T$	Timing Resistor	5.1	100	k $\Omega$
$F_{OSC}$	Oscillator Frequency	1	500	KHz
$T_{OP}$	Operating Free-air Temperature	-20	85	$^{\circ}$ C

**Electrical Characteristics** ( $T_A = 25^{\circ}$ C,  $V_{CC} = 6$ V,  $f = 200$  KHz)

**Reference (REF)**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$V_O$	Output Voltage (pin 16)	$I_O = 1$ mA	2.4	2.5	2.6	V
	Output Voltage Change with Temperature	$T_A = -20^{\circ}$ C ~ $25^{\circ}$ C		-0.1	$\pm 1$	%
		$T_A = 25^{\circ}$ C ~ $85^{\circ}$ C			-0.2	$\pm 1$
$V_{DLI}$	Input Stability	$V_{CC} = 3.6$ V ~ 40V		2	12.5	mV
$V_{DLO}$	Output Stability	$I_O = 0.1$ mA ~ 1mA		1	7.5	mV
$I_O$	Short-circuit Output Current	$V_O = 0$	3	10	30	mA

**Under voltage lockout (UVLO)**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$V_{UT}$	Upper Threshold Voltage ( $V_{CC}$ )	$I_{O(REF)} = 0.1$ mA $T_A = 25^{\circ}$ C		2.65		V
$V_{LWT}$	Lower Threshold Voltage ( $V_{CC}$ )			2.45		V
$V_{HT}$	Hysteresis ( $V_{CC}$ )		80	200		mV

**Electrical Characteristics (Continued)**
**Short-circuit protection (SCP) control**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$V_{IT}$	Input Threshold Voltage	$T_A = 25^\circ\text{C}$	0.65	0.7	0.75	V
$V_{STB}$	Standby Voltage	No pull up	140	185	230	mV
$V_{LT}$	Latched Input Voltage	No pull up		60	120	mV
$I_{SCP}$	Input (Source) Current	$V_I = 0.7\text{V}, T_A = 25^\circ\text{C}$	-10	-15	-20	$\mu\text{A}$
$V_{CT}$	Comparator Threshold Voltage (FB)			1.18		V

**Oscillator (OSC)**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$F_{OSC}$	Frequency	$C_T = 330\text{ pF}, R_T = 10\text{ K}\Omega$		200		KHz
$\Delta F_{OSC}$	Standard Deviation of Frequency	$C_T = 330\text{ pF}, R_T = 10\text{ K}\Omega$		10		%
	Frequency Change with Voltage	$V_{CC} = 3.6\text{V} \sim 40\text{V}$		1		
	Frequency Change with Temperature	$T_A = -20^\circ\text{C} \sim 25^\circ\text{C}$ $T_A = 25^\circ\text{C} \sim 85^\circ\text{C}$		-0.4 -0.2	$\pm 2$ $\pm 2$	

**Dead-time control (DTC)**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$I_{BDT}$	Input Bias Current				1	$\mu\text{A}$
$I_{DT}$	Latch Mode (Source) Current	$T_A = 25^\circ\text{C}$	-80	-145		
$V_{DT}$	Latched Input Voltage	$I_O = 40\mu\text{A}$	2.3			V
$V_{T0}$	Input Threshold Voltage at $f = 10\text{ KHz}$	Zero duty cycle		2.05	2.25	
$V_{T100}$		Maximum duty cycle	1.2	1.45		

**Error-amplifier**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$V_{IO}$	Input Offset Voltage	$V_O (\text{FB}) = 1.25\text{V}$			$\pm 6$	mV
$I_{IO}$	Input Offset Current	$V_O (\text{FB}) = 1.25\text{V}$			$\pm 100$	nA
$I_{IB}$	Input Bias Current	$V_O (\text{FB}) = 1.25\text{V}$		160	500	nA
$V_{CM}$	Common-mode Input Voltage Range	$V_{CC} = 3.6\text{V} \sim 40\text{V}$	1.05 to 1.45			V
$A_V$	Open-loop Voltage Amplification	$R_F = 200\text{ K}\Omega$	70	80		dB
GBW	Unity-gain Bandwidth			1.5		MHz
CMRR	Common-mode Rejection Ratio		60	80		dB
$V_{OH}$	Max. Output Voltage		$V_{ref}-0.1$			V
$V_{OL}$	Min. Output Voltage				1	V
$I_{OI}$	Output (Sink) Current (FB)	$V_{ID} = -0.1\text{V}, V_O = 1.25\text{V}$	0.5	1.6		mA
$I_{OO}$	Output (Source) Current (FB)	$V_{ID} = 0.1\text{V}, V_O = 1.25\text{V}$	-45	-70		$\mu\text{A}$

**Electrical Characteristics ( Continued )**

**Output section**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$I_{LEAK}$	Leakage Current	$V_O = 40V$			10	$\mu A$
$V_{SAT}$	Output Saturation Voltage	$I_O = 10\text{ mA}$		1.2	2	V
$I_{SC}$	Short-circuit Output Current	$V_O = 6V$		90		mA

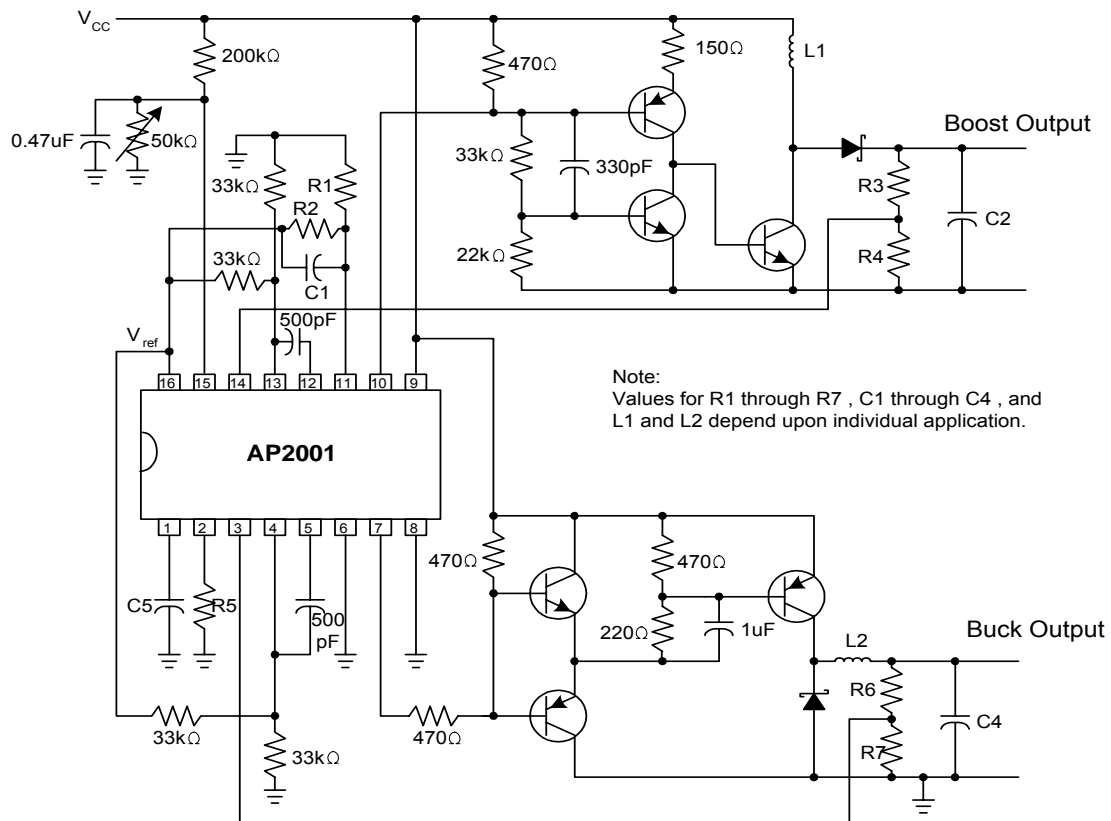
**PWM comparator**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$V_{T0}$	Input Threshold Voltage at $f = 10\text{ KHz (FB)}$	Zero duty cycle		2.05	2.25	V
$V_{T100}$		Maximum duty cycle	1.2	1.45		V

**Total device**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$I_{CCS}$	Standby Supply Current	Off-state		2.5	3.0	mA
$I_{CCA}$	Average Supply Current	$R_T = 10\text{ K}\Omega$		2.8	3.5	mA

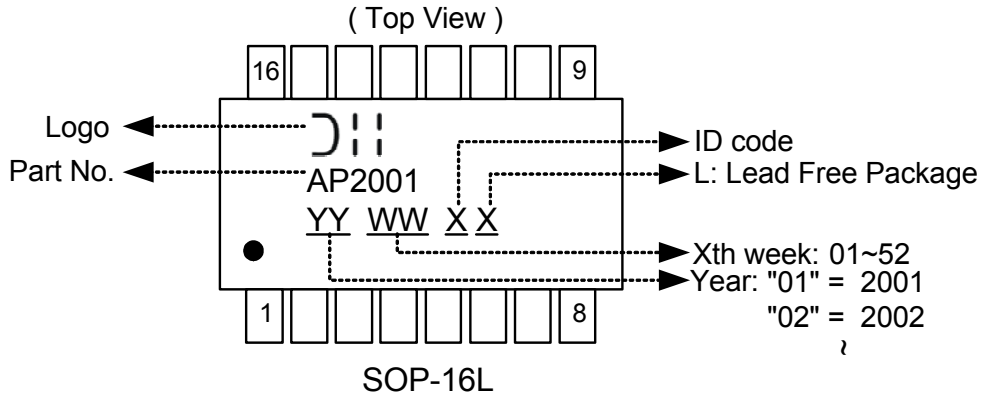
**Typical Application Circuit**



**Dual output DC/DC converter**

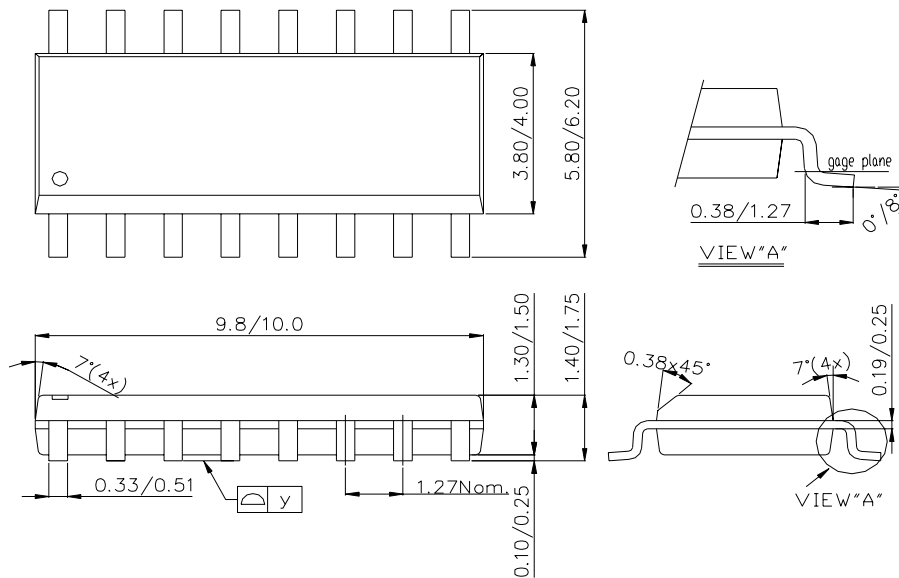
**Marking Information**

(1) SOP-16L



**Package Information**

**(1) Package Type: SOP-16L**



**IMPORTANT NOTICE**

Diodes Incorporated and its subsidiaries reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to any product herein. Diodes Incorporated does not assume any liability arising out of the application or use of any product described herein; neither does it convey any license under its patent rights, nor the rights of others. The user of products in such applications shall assume all risks of such use and will agree to hold Diodes Incorporated and all the companies whose products are represented on our website, harmless against all damages.

**LIFE SUPPORT**

Diodes Incorporated products are not authorized for use as critical components in life support devices or systems without the expressed written approval of the President of Diodes Incorporated.

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Diodes Incorporated:](#)

[AP2001SL-13](#)