

Interface circuit (relay and lamp driver)

Features

- High output current
- Adjustable short-circuit protection to ground
- Internal thermal protection with hysteresis to avoid the intermediate output levels
- Large supply voltage range: 8 to 30V
- Short-circuit protection to V_{CC}
- Open ground protection



The TDE3247 is a monolithic amplifier designed for high current and high voltage applications, specifically to drive lamps, relays and stepping motors.

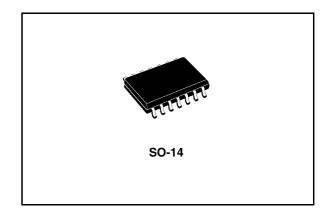
The Device is essentially blow-out proof. Current limiting is available to limit the peak output current to a safe value, the adjustment only required an external resistor.

In addition, thermal shut-down is provided to keep the IC from overheating.

If external dissipation becomes too high, the driver will shut-down to prevent excessive heating.

The output is also protected against short-circuit with the positive power supply.

The device operates over a wide range of supply voltage from standard $\pm 15V$ operational amplifier supplies down to the single 12V or 24V used for industrial electronic systems.



Order codes

Part number	Package	Packaging
TDE3247FP	SO-14	Tube
TDE3247FPT	SO-14	Tape & Reel

Contents TDE3247

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1 Schematic diagram and pin connections

Figure 1. Schematic diagram

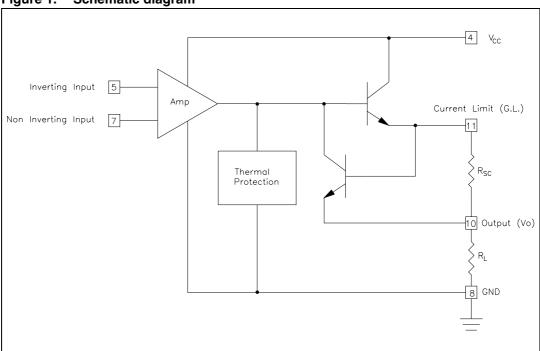
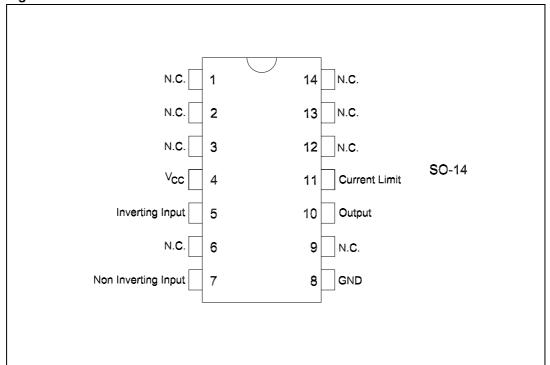


Figure 2. Pin connections



Electrical ratings TDE3247

2 Electrical ratings

Table 1. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V _{CC}	Supply Voltage	36	V
V _O	Differential Input Voltage	36	V
V _I	Input Voltage	36	V
I _O	Output Current	300	mA
P _{TOT}	Power Dissipation	Internally limited	W
T _{oper}	Ambient Temperature Range	-25 to 85	°C
T _{STG}	Storage Temperature Range	-65 to +150	°C

Table 2. Thermal data

R _{th}	Junction-ceramic Substrate (case glued to substrate) For SO-14	90	°C/W
R _{th}	Junction-ceramic Substrate (case glued to substrate, substrate temperature maintened constant) For SO-14	65	°C/W

3 Electrical characteristics

(-25°C ≤T_A 85°C, 8V ≤V_{CC} ≤30V, I_O ≤150mA, T_J ≤150°C, unless otherwise specified) *Note: 1*

Table 3. Electrical characteristics

Symbol	Parameter	Test Conditions	Min.	Тур.	Max.	Unit
V _{IO}	Input Offset Voltage	Note 2		2	50	mV
I _{IB}	Input Bias Current			0.1	1.5	μΑ
	$V_{CC} = 24V$, $I_O = 0A$, $T_{amb} = 25$ °C					
Icc	Supply Current	High Level		4	10	mA
		Low Level		2		mA
V _{CM}	Common Mode Input Voltage Range		2		V _{CC} -2	V
I _{SC}	Short-circuit Current	$V_{CC} = 24V$, $T_{amb} = 25$ °C $R_{SC} = 3.3\Omega$		250		mA
V _{CC} - V _O	Output Saturation Voltage (Output High)	$(V_I^{+-}V_I^{-}) \le 50 \text{mV}$ $I_O = 150 \text{mA}, R_{SC} = 0$ $T_J = 25^{\circ}\text{C}$		1.2	1.8	V
	_	V _O = 0V, V _{CC} = 24V				
101	Output Leakage Current (Output Low)	T _J = 25°C		1	100	μΑ
		T _J = 85°C			500	μΑ
Ios	Minimum Short-current Output Current	$T_{amb} = 25$ °C, $V_{CC} = 24V$ $R_{SC} = \infty$		50		mA

Note: 1 For operating at high temperatures, the device must be derated based on a 150°C maximum junction and a junction to ambient thermal resistance of 110°C/W

² The offset voltage given in the maximum value of input voltage required to drive the output voltage within 2V of the ground or the supply voltage.

Electrical characteristics TDE3247

3.1 Electrical characteristics (curves)

Figure 3. Available output current vs. limiting Figure 4. Supply current vs. junction resistor temperature

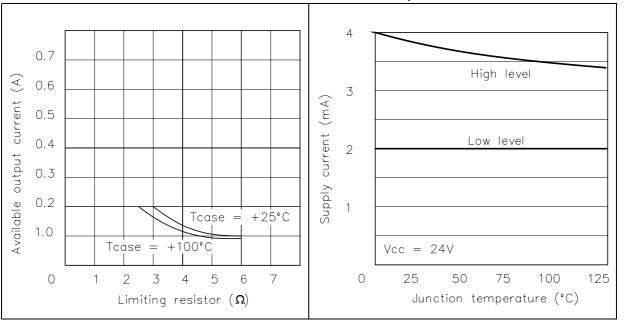
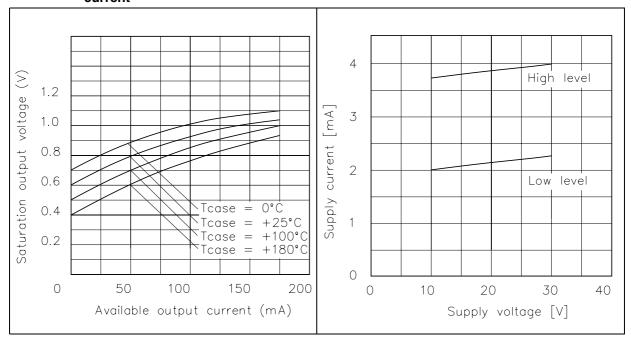


Figure 5. Saturation output voltage vs. case temperature and available output current

Figure 6. Supply current vs. supply voltage



TDE3247 Electrical characteristics

Figure 7. Supply voltage vs. minimum limiting Figure 8. Response time resistor value

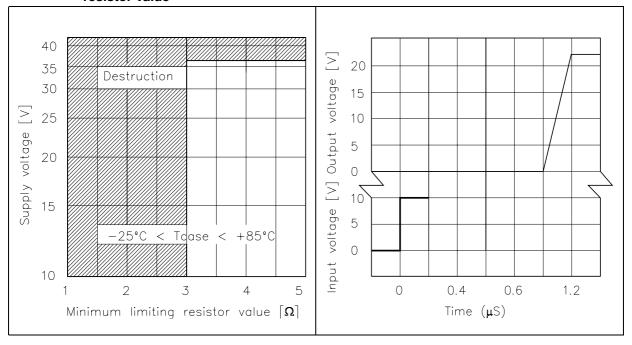
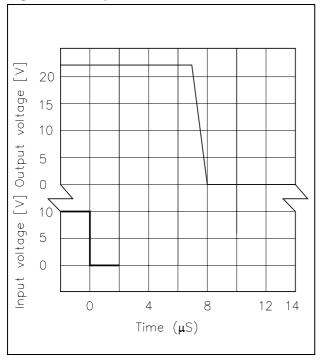


Figure 9. Response time



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Application circuit TDE3247

4 Application circuit

Figure 10. Basic application circuit

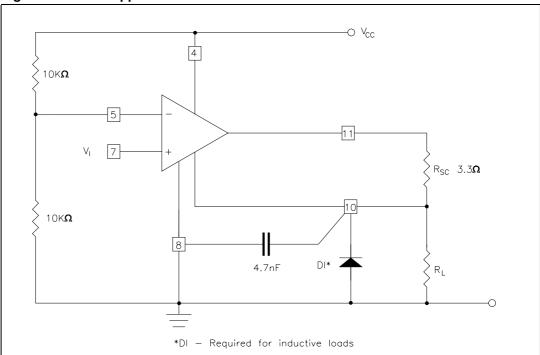
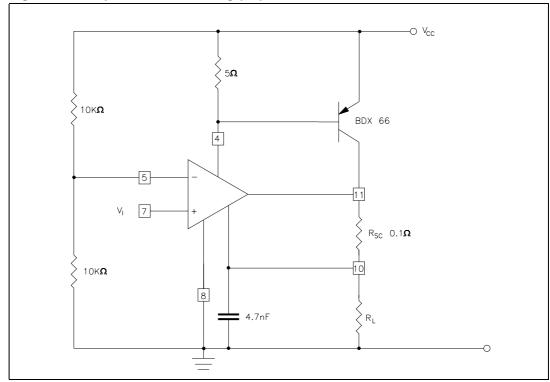


Figure 11. Output current boosting (5A)



5 Package mechanical data

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect. The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com

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Table 4. SO-14 Mechanical data

	mm. inch		inch				
Dim.	Min.	Тур	Max.	Min.	Тур.	Max.	
Α			1.75			0.068	
a1	0.1		0.2	0.003		0.007	
a2			1.65			0.064	
b	0.35		0.46	0.013		0.018	
b1	0.19		0.25	0.007		0.010	
С		0.5			0.019		
c1	45° (typ.)						
D	8.55		8.75	0.336		0.344	
E	5.8		6.2	0.228		0.244	
е		1.27			0.050		
e3		7.62			0.300		
F	3.8		4.0	0.149		0.157	
G	4.6		5.3	0.181		0.208	
L	0.5		1.27	0.019		0.050	
М			0.68			0.026	
S	8° (max.)						

Figure 12. Package dimensions

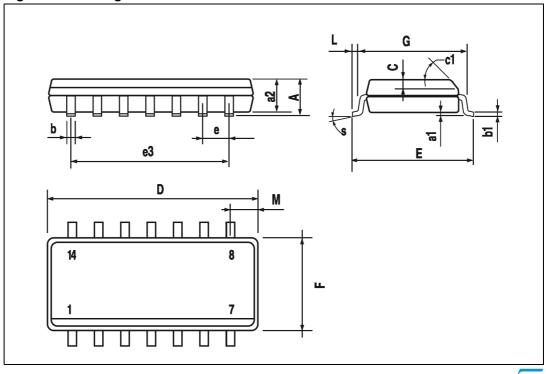


 Table 5.
 Tube shipment information

Tube mechanical data			
	mm.	inch.	
A	6.60 ±0.10	0.260 ±0.004	
В	1.90 ±0.10	0.075 ±0.004	
С	0.60 ±0.10	0.024 ±0.004	
D	7.80 ±0.10	0.307 ±0.004	
Е	4.30 ±0.10	0.169 ±0.004	
BASE QUANTITY	100 pcs.		
BULK QUANTITY	2000 pcs.		

Figure 13. Tube dimension

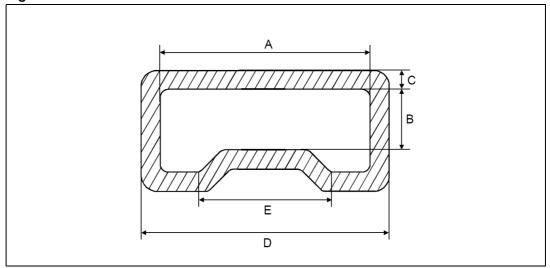


Table 6. Tape & reel shipment information

Tape mechanical data				
	mm.	inch		
D	1.50 +0.1/0	0.059 +0.004/0		
E	1.75 ±0.1	0.069 ±0.004		
Po	4.00 ±0.1	0.157 ±0.004		
T max.	0.40	0.016		
D1 min.	1.50	0.059		
F	7.5 ±0.05	0.295 ±0.002		
K max.	6.50	0.256		
P2	2.00 ±0.05	0.079 ±0.002		
R	40	1.575		
W	16.00 ±0.30	0.630 ±0.012		
P1	12.00	0.472		
Ao, Bo, Ko	0.05 min to 0.90 max.	0.002 min to 0.035 max.		

Figure 14. Tape specification

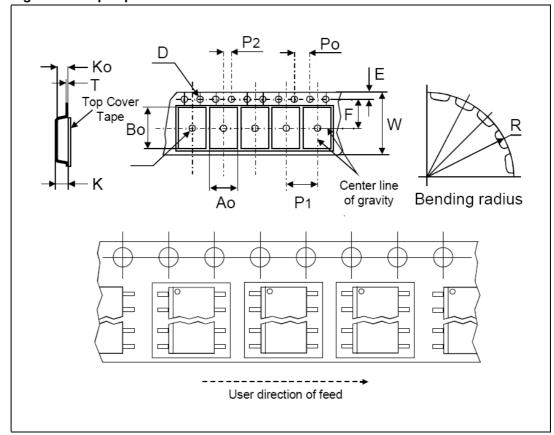
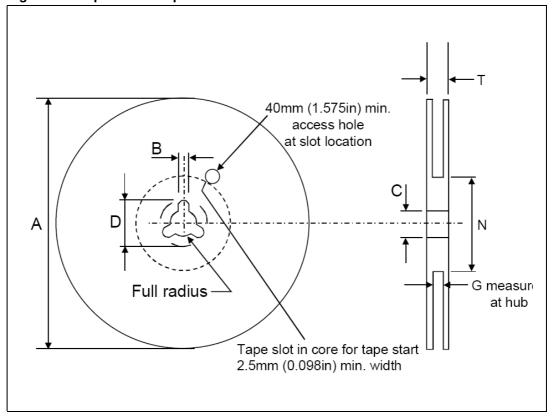


Table 7. Reel mechanical data

	mm.	inch	
Tape size	16.0 ±0.30	0.630 ±0.012	
A max.	330.0	12.992	
B min.	1.5	0.059	
С	13.0 ±0.20	0.512 ±0.008	
D min.	20.2	0.795	
N min.	60	2.362	
G	16.4 +2/-0	0.646 +0.079/-0	
T max.	22.4	0.882	

Figure 15. Tape & reel shipment information



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Revision history TDE3247

6 Revision history

Table 8. Revision history

Date	Revision	Changes
20-Apr-2006	1	First release
27-Jun-2006	2	Typo in cover page

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