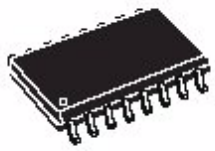
L2720W

Low drop dual power operational amplifiers

Features

- Output current up to 1 A
- Operates at low voltages
- Single or split supply
- Large common-mode and differential-mode range
- Low input-offset voltage
- Ground compatible inputs
- Low saturation voltage
- Thermal shutdown
- Clamp diode



SO16 (Wide)

Description

The L2720W is a monolithic integrated circuit in SO16 (Wide) package, intended for use as a power operational amplifier in a wide range of applications including servo amplifiers and power supplies.

It is particularly suitable for driving coils, inductive loads and for use in motors.

The high gain and high output power capability provide superior performance whenever an operational amplifier/power booster combination is required.

Table 1. Device summary

Order code	Package	Packaging
L2720W	SO16 (Wide)	Tube
L2720W13TR	SO16 (Wide)	Tape and reel

1 Connection diagrams

Figure 1. Block diagram

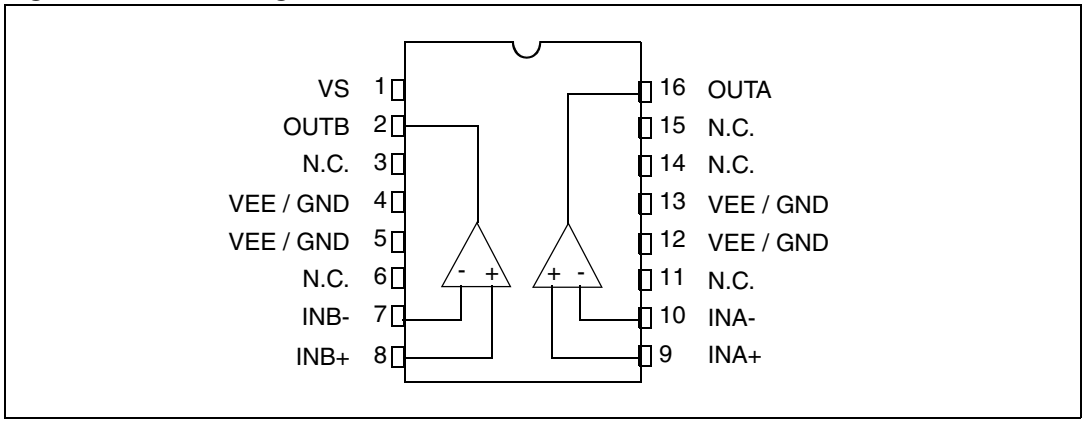
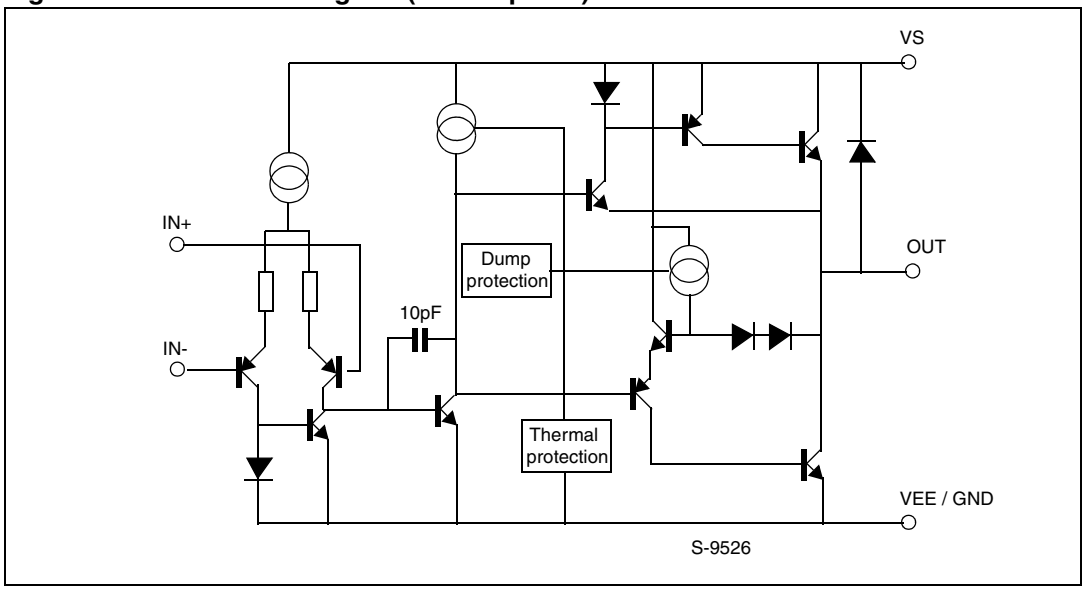


Figure 2. Schematic diagram (one amplifier)



2 Pin out

Figure 3. Pin connection (top view)

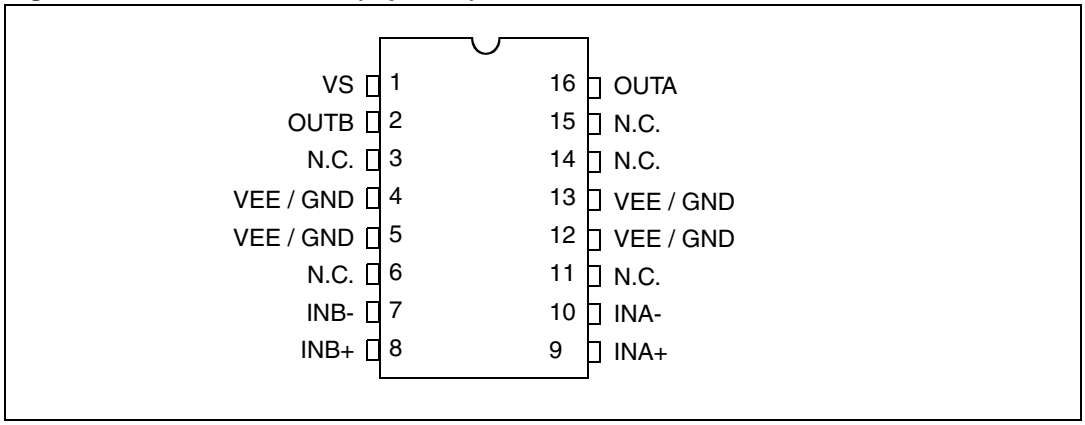


Table 2. Pin description

Pin	Name	Type	Description
1	VS	Power	Power supply positive
2	OUTB	Output	Amplifier B output
3	N.C.	-	No internal connection
4	VEE / GND	Power	Power supply negative or ground
5	VEE / GND	Power	Power supply negative or ground
6	N.C.	-	No internal connection
7	INB-	Input	Amplifier B input
8	INB+	Input	Amplifier B input
9	INA+	Input	Amplifier A input
10	INA-	Input	Amplifier A input
11	N.C.	-	No internal connection
12	VEE / GND	Power	Power supply negative or ground
13	VEE / GND	Power	Power supply negative or ground
14	N.C.	-	No internal connection
15	N.C.	-	No internal connection
16	OUTA	Output	Amplifier A output

3 Electrical specifications

3.1 Absolute maximum ratings

Table 3. Absolute maximum ratings

Pin/symbol	Description	Min	Max	Unit
V_S	Supply voltage	-	28	V
V_{S-PK}	Peak supply voltage (50 ms)	-	50	V
V_i	Input voltage range	-	V_s	V
V_i	Differential input voltage range	-	$\pm V_s$	V
I_O	DC output current	-	1	A
I_{O-PK}	Peak output current (non repetitive)	-	1.5	A
T_{op}	Operating ambient temperature range	-40	125	°C
T_{stg}, T_j	Storage and junction temperature range	-40	150	°C

3.2 Thermal data

Table 4. Thermal data

Device	Parameter	Min	Typ	Max	Unit
$R_{th\ j\text{-}amb}$	Thermal resistance junction to ambient (1)	-	65	-	°C/W
$R_{th\ j\text{-}case}$	Thermal resistance junction to case pins (2)	-	12	-	°C/W

1. On double layer PCB with 4 cm^2 copper dissipating area
2. Referred to pins 4, 5, 12 and 13.

3.3 Recommended operating conditions

Table 5. Recommended operating conditions

Symbol	Parameter	Min	Typ	Max	Unit
V_S	Positive single power supply	4.0	-	28	V
	Positive split power supply	2.0	-	14	V
V_E	Negative single power supply	-	0	-	V
	Negative split power supply	-2.0	-	-14	V
V_{IN}	Input voltage	-	-	V_S to V_E	V

3.4 Electrical characteristics

The electrical specifications in *Table 6* below are given for operation under the conditions V_S = 24 V, T_{amb} = -40 °C to 125 °C and RI connected to GND, unless otherwise specified

Table 6. Electrical characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
I_s	Quiescent current	$V_O = V_S / 2$	T_{amb} = 25 °C	-	10	15	mA
			-	-	10	18	
Iib	Input bias current	V_{CM} = 0	T_{amb} = 25 °C	-	0.2	1	µA
			-	-	0.2	1	
Iob	Input offset current	V_{CM} = 0	T_{amb} = 25 °C	-	-	100	nA
			-	-	-	100	
V_{os}	Input offset voltage	T_{amb} = 25 °C		-10	-	10	mV
		-		-10	-	10	
$\Delta V_{os}/\Delta T$	Average temperature coefficient of V_{os}	-		-	20	-	µV/°C
SR	Slew rate	Vin = -10 V to +10 V, R_L = 2 kΩ, C_L = 100 pF, Av = -1, T_{amb} = 25 °C		-	2	-	V/µs
B	Gain-bandwidth product	-		-	1.2	-	MHz
G_v	Open loop voltage gain	f = 100 Hz		70	80	-	dB
		f = 1 kHz		-	60	-	
CMRR	Common mode rejection ratio	f = 1 kHz		66	84	-	dB
SVRR	Supply voltage rejection ratio	f = 100 Hz R_G = 10 kΩ V_R = 0.5 V	V_s = 24 V	-	70	-	dB
			Vs = ±12 V	60	75	-	
$V_{DROP(H)}$	Drop voltage high	I_p = 100 mA	T_{amb} = 25 °C	-	0.7	1	V
			-	-	0.8	1.5	
		I_p = 1 A	T_{amb} = 25 °C	-	1.0	1.5	
			-	-	1.1	1.5	
$V_{DROP(L)}$	Drop voltage low	I_p = 100 mA	T_{amb} = 25 °C	-	0.3	0.7	V
			-	-	0.4	1	
		I_p = 1 A	T_{amb} = 25 °C	-	0.5	1	
			-	-	1.3	1.5	
C_s	Channel separation	f = 1 kHz; R_L = 10 Ω; G_v = 30 dB	V_s = 24 V	-	60	-	dB
			V_s = 6 V	-	60	-	
e_N	Input noise voltage	B = 22 Hz to 22 kHz, T_{amb} = 25 °C		-	10	-	µV

Table 6. Electrical characteristics (continued)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
I_N	Input noise current	B = 22 Hz to 22 kHz, T_{amb} = 25 °C	-	200	-	pA
ϕ_m	Phase margin	R_L = 2 kΩ, C_L = 100 pF, T_{amb} = 25 °C	-	65	-	°C
A_m	Gain margin	R_L = 2 kΩ, C_L = 100 pF, T_{amb} = 25 °C	-	15	-	dB

3.5 Characterization curves

Figure 4. Quiescent current vs supply current

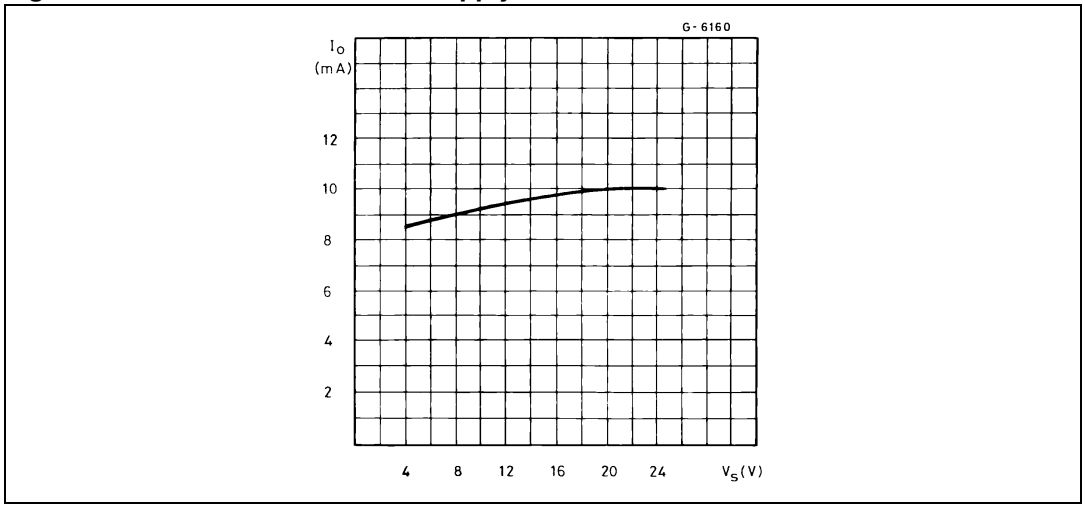


Figure 5. Open loop gain vs frequency

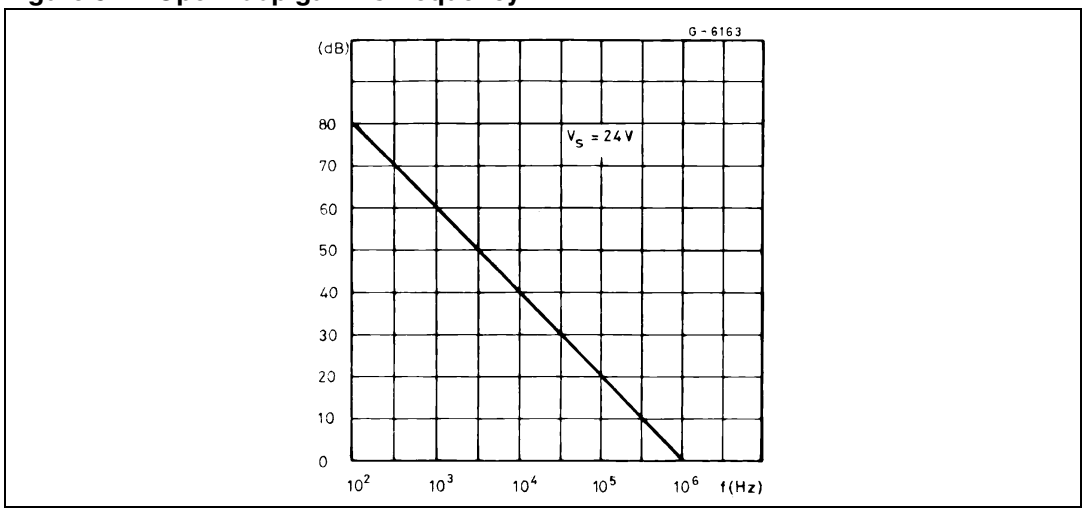


Figure 6. Common mode rejection vs frequency

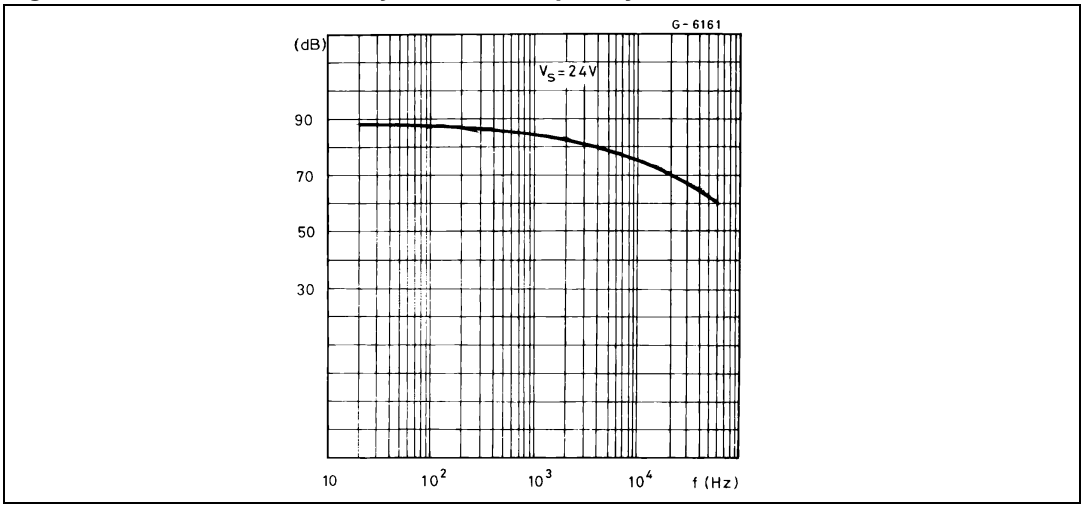


Figure 7. Output swing vs load current (Vs = ±5 V)

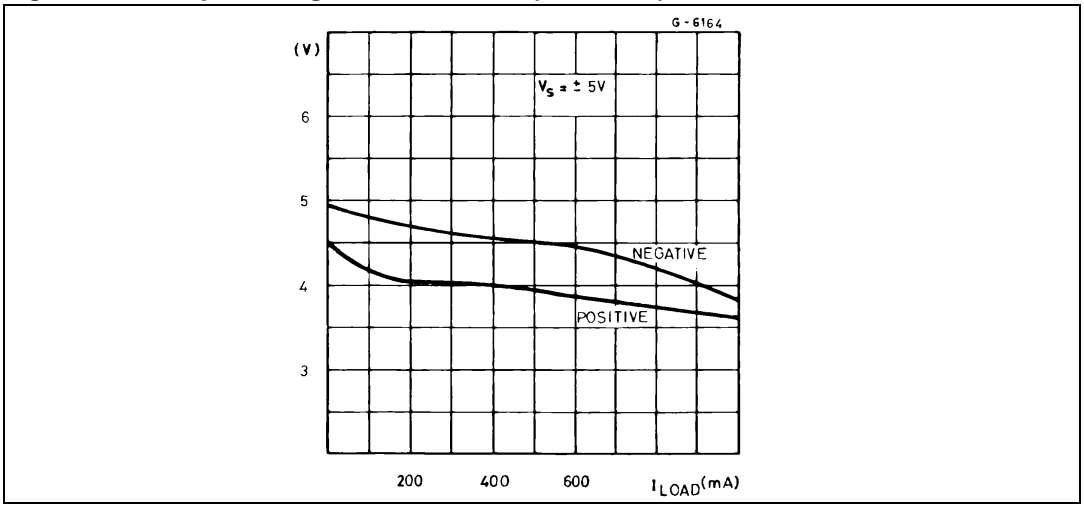


Figure 8. Output swing vs load current (Vs = ±12 V)

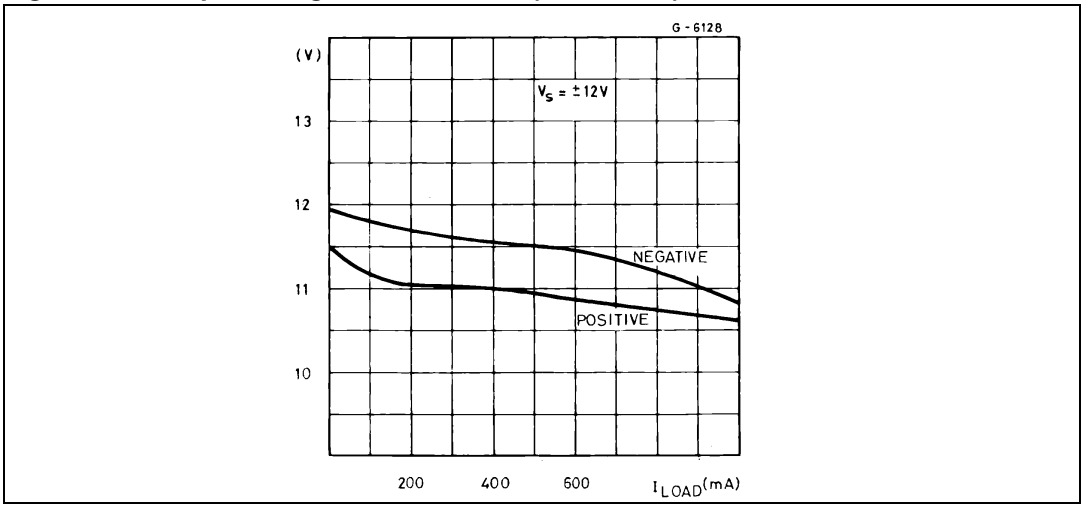


Figure 9. Supply voltage rejection vs frequency

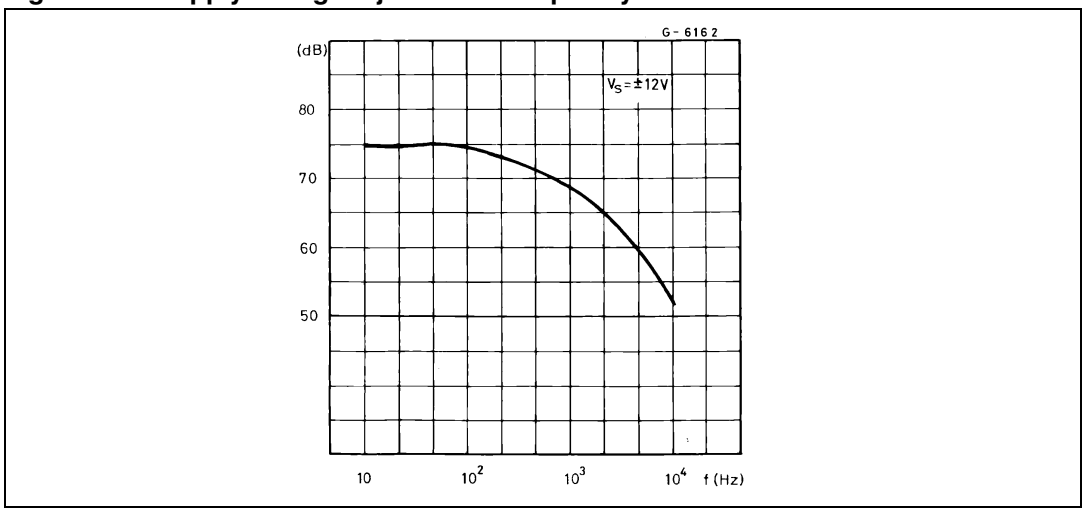


Figure 10. Channel separation vs frequency

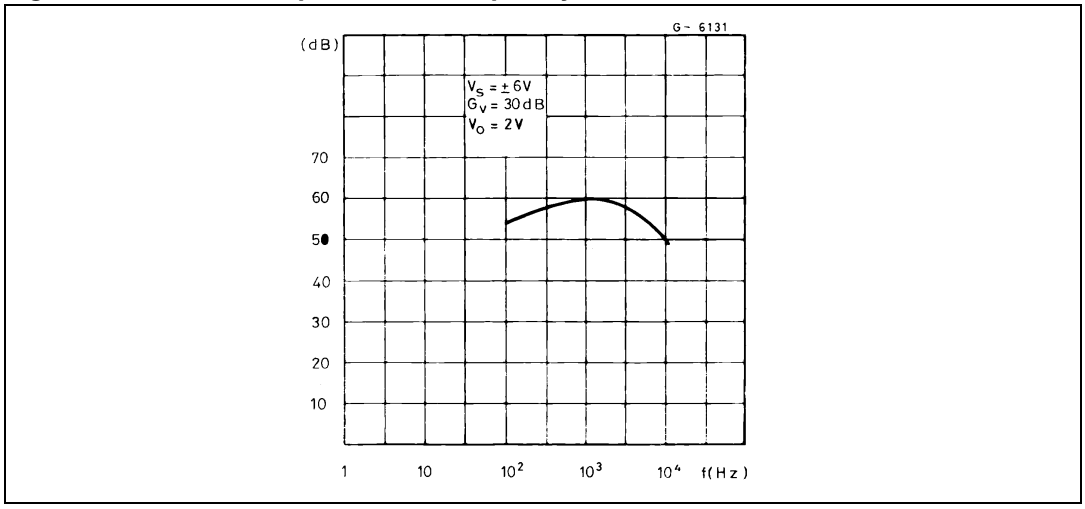


Figure 11. Voltage gain and phase vs frequency

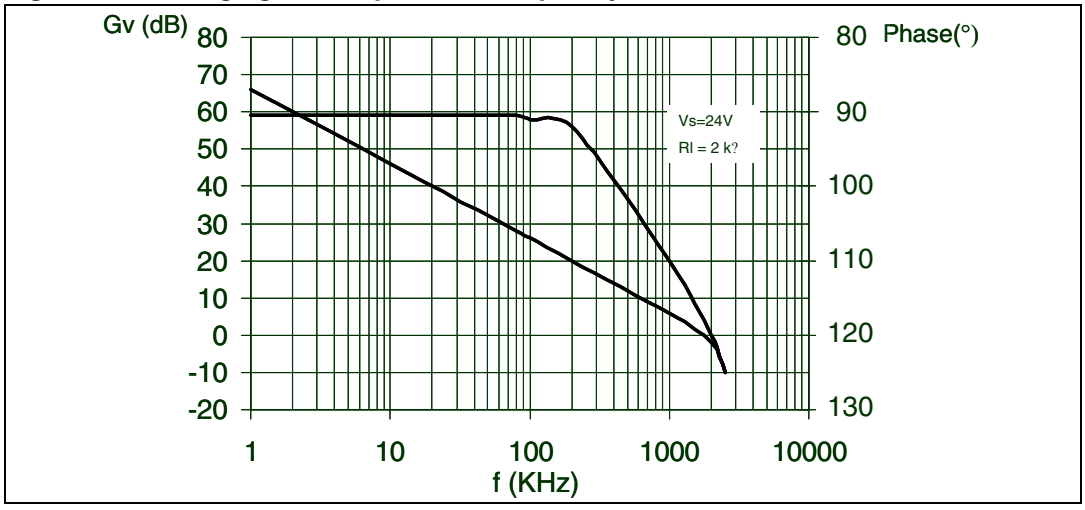
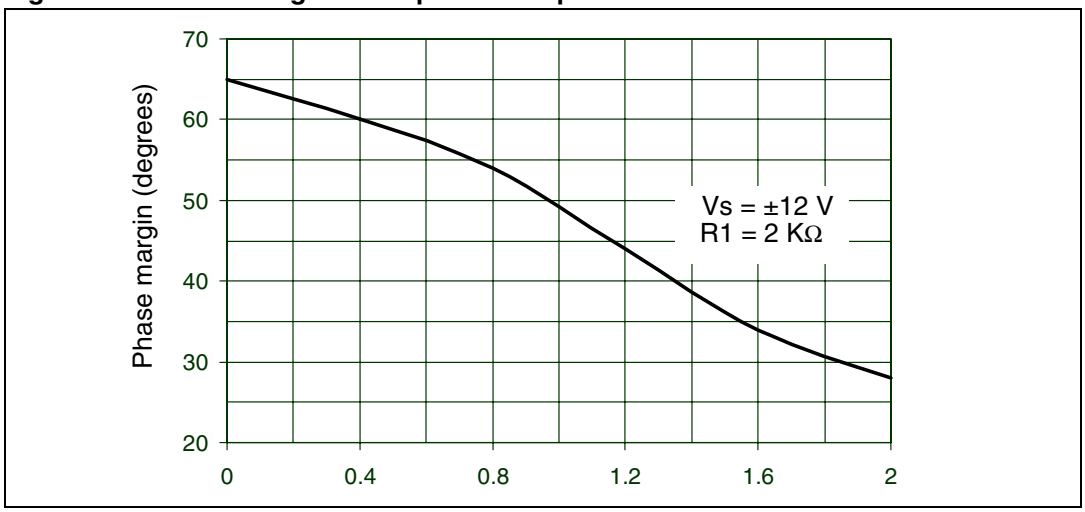


Figure 12. Phase margin vs output load capacitance



4 Package mechanical data

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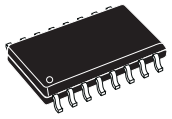
Figure 13. SO16 (Wide) mechanical data and package dimensions

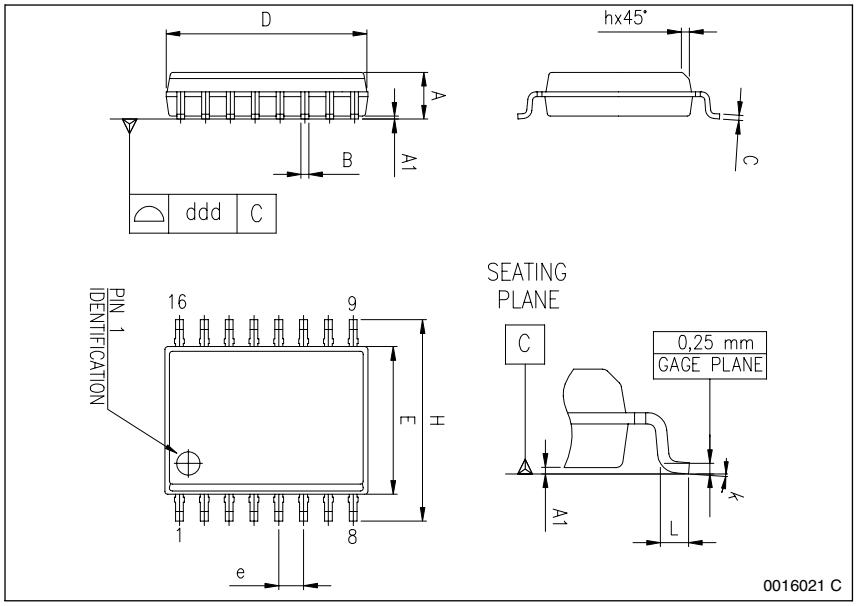
DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	2.35	-	2.65	0.093	-	0.104
A1	0.10	-	0.30	0.004	-	0.012
B	0.33	-	0.51	0.013	-	0.200
C	0.23	-	0.32	0.009	-	0.013
D (1)	10.10	-	10.50	0.398	-	0.413
E	7.40	-	7.60	0.291	-	0.299
e	-	1.27	-	-	0.050	-
H	10.0	-	10.65	0.394	-	0.419
h	0.25	-	0.75	0.010	-	0.030
L	0.40	-	1.27	0.016	-	0.050
k	0° (min.), 8° (max.)					
ddd	-	-	0.10	-	-	0.004

(1) "D" dimension does not include mold flash, protusions or gate burrs. Mold flash, protusions or gate burrs shall not exceed 0.15mm per side.

OUTLINE AND MECHANICAL DATA



SO16 (Wide)



5 Revision history

Table 7. Document revision history

Date	Revision	Changes
04-Apr-2007	1	Initial release.
03-Sep-2010	2	Complete update and change in presentation

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