

GS358

Dual Operational Amplifiers

Product Description

The GS358 consists of two independent, high gain, internally frequency compensated operational amplifiers which were designed specifically to operate from a single power supply over a wide range of voltages.

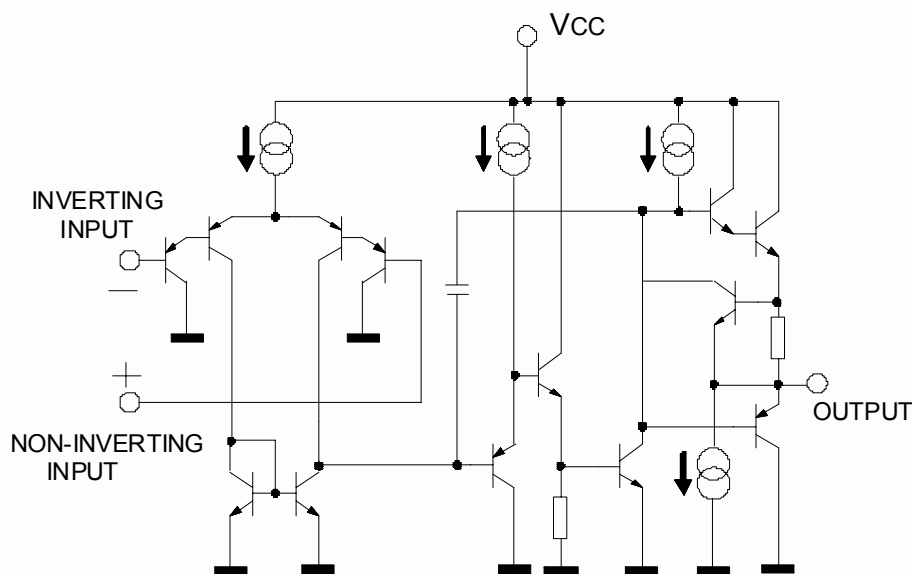
Operation from split power supplies is also possible and the low power supply current drains in independent of the magnitude of the power supply voltage.

Application areas include transducer amplifiers, dc gain blocks and all the conventional op amp circuits, which now can be more easily implemented in single power supply systems. For example, the GS358 can be directly operated off of the standard +5V power supply voltage which is used in digital systems and will easily provide the required interface electronics without requiring the additional $\pm 15V$ power supplies.

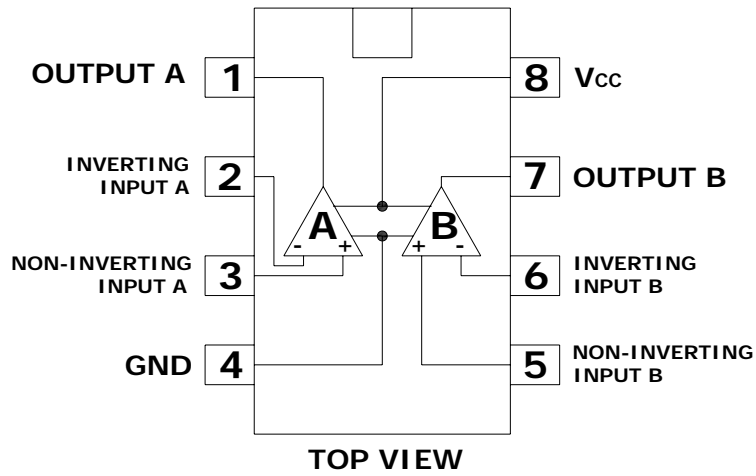
Features

- Wide range of supply voltages 3V to 36V
- Low supply current drain independent of supply voltage 0.7mA (TYP.)
- Low input biasing current
- Low input offset voltage and offset current
- Input common-mode voltage range includes ground
- Differential input voltage range equal to the power supply voltage
- DC voltage gain: 100V/mV TYP.
- Internally frequency compensation
- RoHS Compliant, 100%Pb & Halogen Free
- ESD Protection(2KV) between V+/V- and GND

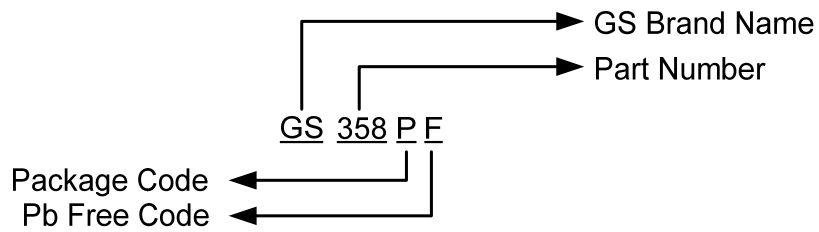
Block Diagram



Pin Assignments

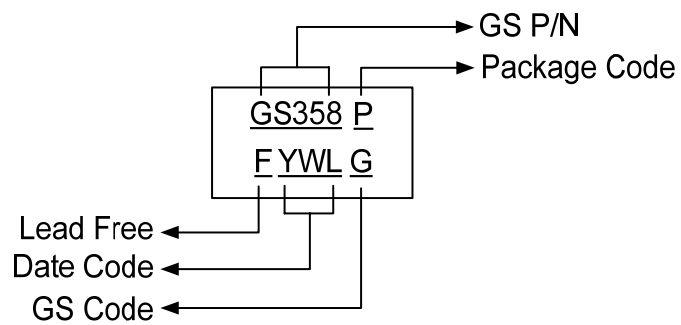


Ordering Information



Device	Package
GS358PF	DIP-8
GS358SF	SOP-8

Marking Information



Absolute Maximum Ratings

Symbol	Parameter	Value		Unit
V _{CC}	Single Supply	40		V
V _{CC} , V _{EE}	Split Supply	±20		V
V _{IDR}	Input Differential Voltage Range	±40		V
I _{OS}	Output Short-circuit to GND	Continuous		
T _J	Junction Temperature	150		°C
T _{STG}	Storage Temperature Range	-65 to +150		°C
T _A	Operating Ambient Temperature Range	-40 to 85		°C
θ _{JA}	Thermal Resistance (Junction to Ambient)	DIP-8	125	°C/W
		SOP-8	160	
θ _{JC}	Thermal Resistance (Junction to Case)	DIP-8	42	°C/W
		SOP-8	22	
ESD	ESD Rating (HBM)	2		KV

Electrical Characteristics

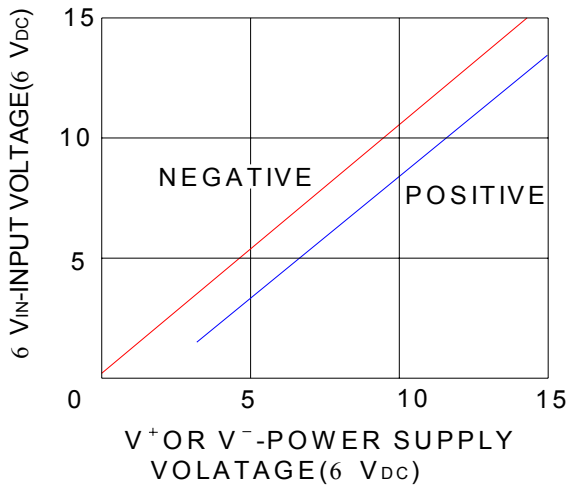
at specified free-air temperature, $V_{CC}=5V$ (Unless Otherwise Noted)

Symbol	Parameter	Test Conditions*	Min	Typ	Max	Unit	
V_{IO}	Input offset voltage	$V_{CC}=5V$ to Max. $V_{IC}=V_{ICR}$ min, $V_o = 1.4V$	25°C		3	7	mV
			Full range			9	
αV_{IO}	Average temperature coefficient of input offset voltage		Full range		7		$\mu V/^\circ C$
I_{IO}	Input offset current	$V_o = 1.4V$	25°C		2	50	nA
			Full range			150	
αI_{IO}	Average temperature coefficient of input offset current		Full range		10		$\mu A/^\circ C$
I_{IB}	Input bias current	$V_o = 1.4V$	25°C		20	250	nA
			Full range			500	
V_{ICR}	Common-mode input voltage ange	$V_{CC} = 5V$ to MAX	25°C	0 to $V_{CC}-1.5$			V
			Full range	0 to $V_{CC}-2$			
V_{OH}	High-level output voltage	$R_L = 2k\Omega$	25°C	$V_{CC}-1.5$			V
		$V_{CC} = MAX,$ $R_L = 2k\Omega$	Full range	26			
		$V_{CC} = MAX,$ $R_L = 10k\Omega$	Full range	27	28		
V_{OL}	Low-level output voltage	$R_L = 10k\Omega$	Full range		5	20	mV
A_{VD}	Large-signal differential voltage amplification	$V_{CC} = 15V$ $V_o=1V$ to 11V $R_L=2k\Omega$	25°C	25	100		V/mV
			Full range	15			
CMRR	Common-mode rejection ratio	$V_{CC} = 5V$ to MAX $V_{IC} = V_{ICR}$ min	25°C	65	80		dB
K_{SVR}	Supply voltage rejection ratio ($\Delta V_{CC}/\Delta V_{IO}$)	$V_{CC} = 5V$ to MAX	25°C	65	100		dB
V_{O1}/V_{O2}	Crosstalk attenuation	$f = 1k$ to 20k (Hz)	25°C		120		dB
I_o	Output current	$V_{CC} = 15V,$ $V_{ID} = 1V,$ $V_o = 0V$	25°C	-20	-30		mA
			Full range	-10			
		$V_{CC} = 15V$ $V_{ID} = -1V,$ $V_o = 15V$	25°C	10	20		
			Full range	5			
$V_{ID} = -1V,$ $V_o = 200mV$	25°C	12	30		μA		
I_{OS}	Short-circuit output current	V_{CC} at 5V, GND at -5V, $V_o = 0V$	25°C		± 40	± 60	mA
I_{CC}	Supply current (two amplifiers)	$V_o = 2.5V,$ No load	Full range		0.7	1.2	mA
		$V_{CC} = MAX,$ $V_o = 0.5V_{CC},$ No load	Full range		1	2	

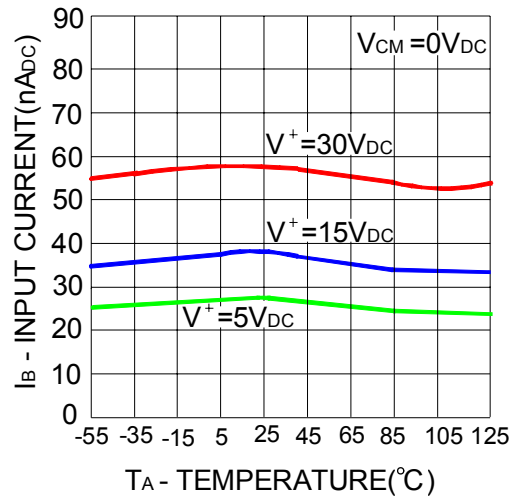
*All characteristics are measured under open-loop conditions with zero common-mode input voltage unless otherwise specified. "MAX" V_{CC} for testing Purposes is 30V. Full range is -40°C to 85°C

Typical Performance Characteristics

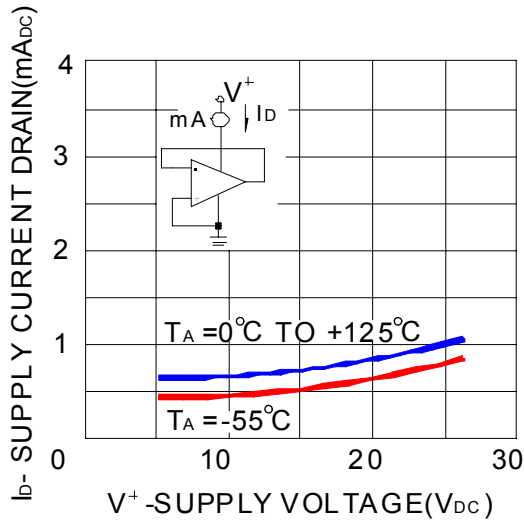
Input Voltage Range



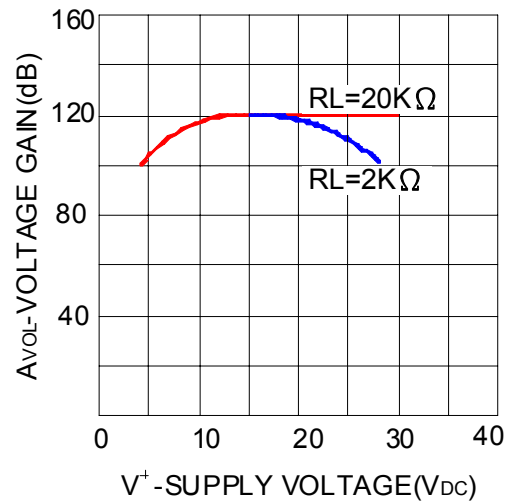
Input Current



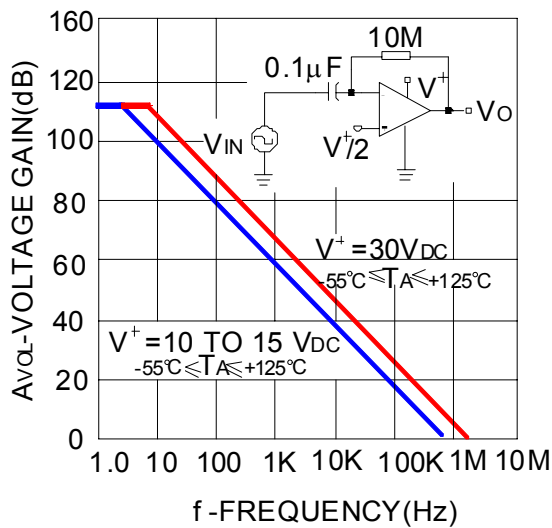
Supply Current



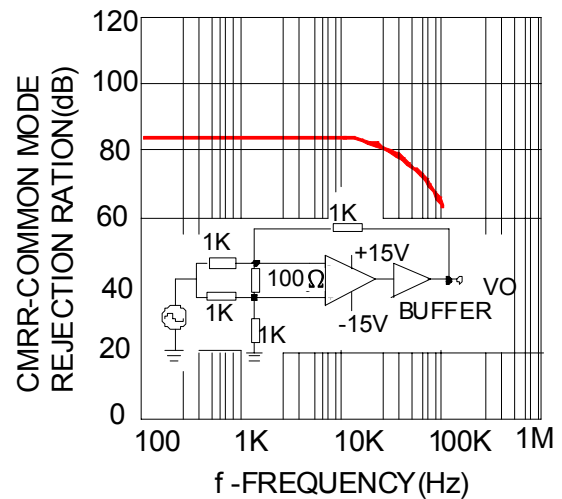
Voltage Gain



Open Loop Frequency Response

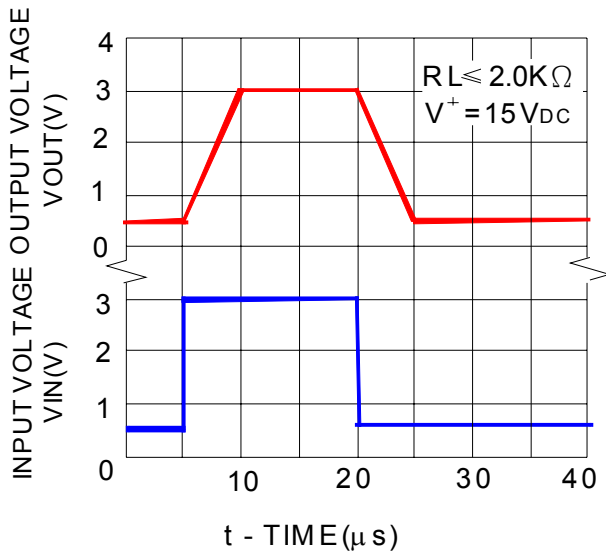


Common Mode Rejection Ratio

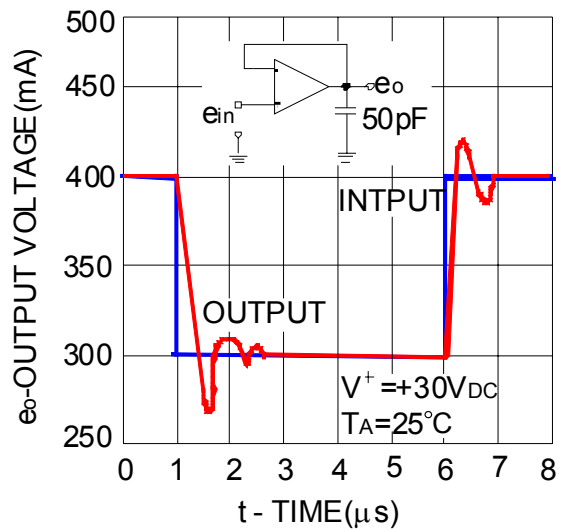


Typical Performance Characteristics (Continue)

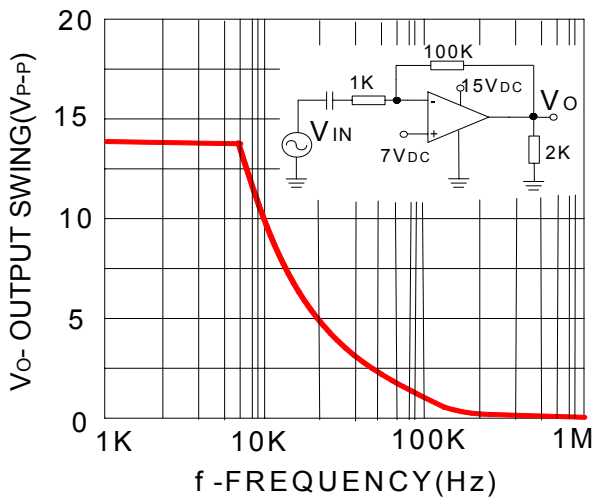
Voltage Follower Pulse Response



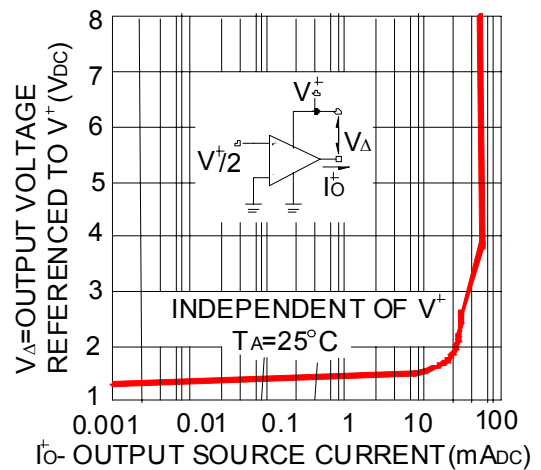
Voltage Follower Pulse Response (Small Signal)



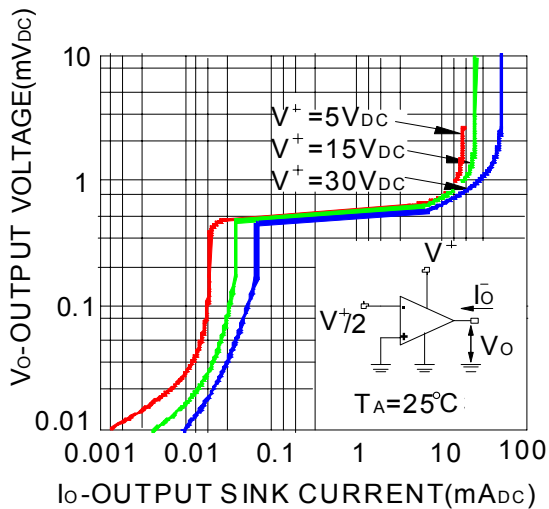
Large Signal Frequency Response



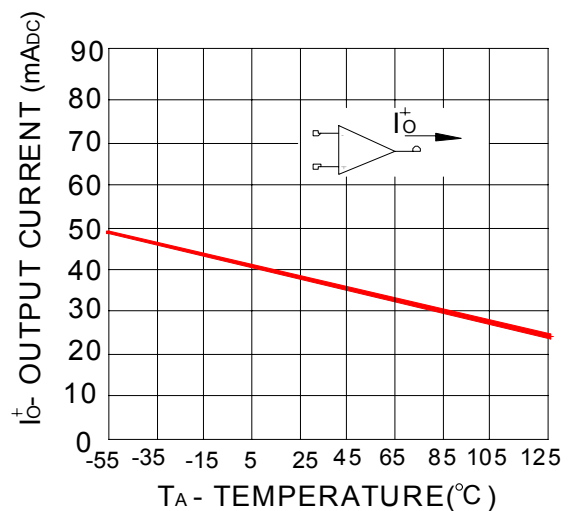
Output Characteristics Current Sourcing



Output Characteristics Current Sinking

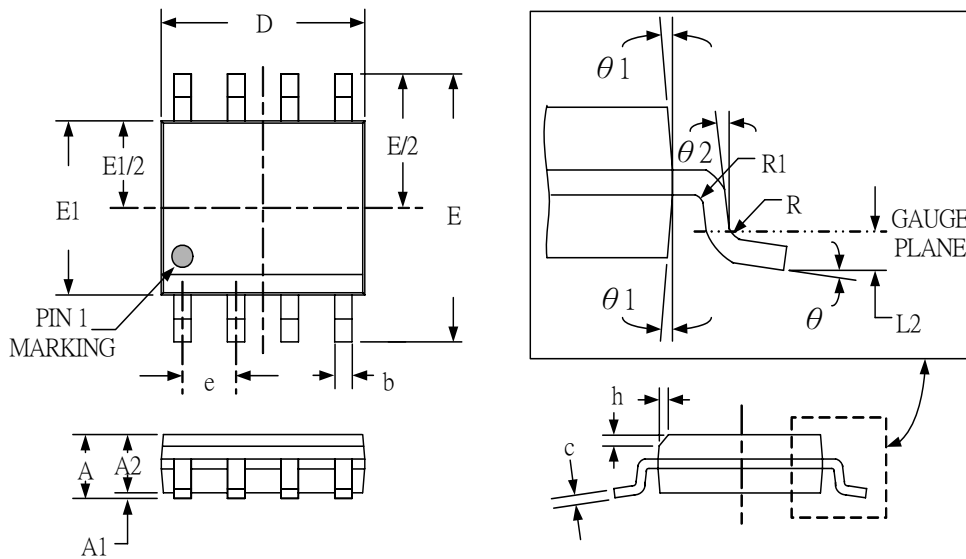


Current Limiting



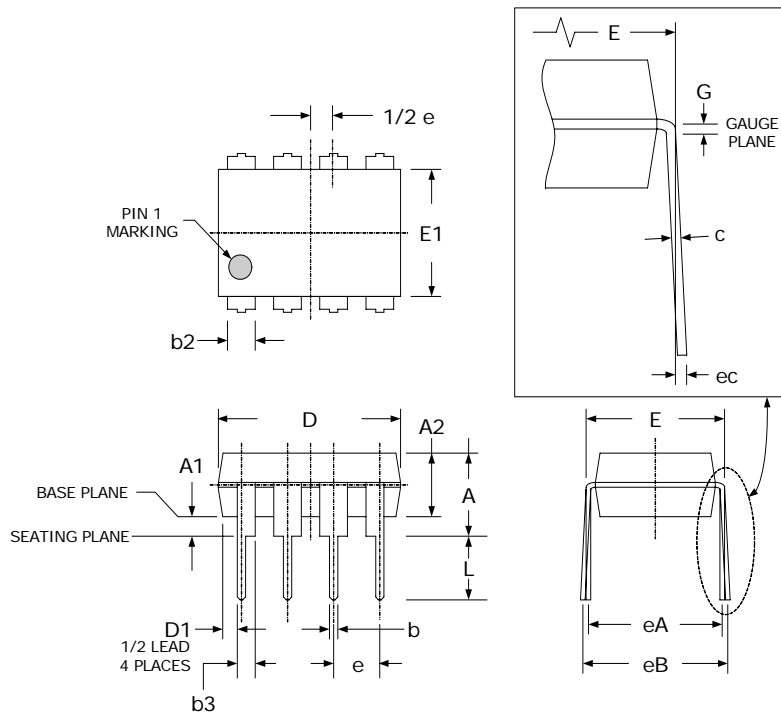
Package Dimension

SOP-8 PLASTIC PACKAGE



Dimensions				
SYMBOL	Millimeters		Inches	
	MIN	MAX	MIN	MAX
A	1.35	1.75	.053	.069
A1	0.10	0.25	.004	.010
A2	1.25	1.65	.049	.065
b	0.31	0.51	.012	.020
b1	0.28	0.48	.011	.019
c	0.17	0.25	.007	.010
D	4.70	5.20	.185	.205
E	5.80	6.20	.228	.244
E1	3.70	4.10	.146	.161
e	1.27 (TYP)		.050 (TYP)	
L	0.40	1.27	.016	.050
L1	1.04 (TYP)		.041 (TYP)	
L2	0.25 (TYP)		.010 (TYP)	
R	0.07	-	.003	-
R1	0.07	-	.003	-
h	0.25	0.50	.010	.020
θ	0°	8°	0°	8°
θ1	5°	15°	5°	15°
θ2	0°	-	0°	-

DIP-8 PLASTIC PACKAGE







Dimensions



SYMBOL	Millimeters		Inches	
	MIN	MAX	MIN	MAX
A	-	5.33	-	.210
A1	0.38	-	.015	-
A2	2.92	4.95	.115	.195
b	0.36	0.56	.014	.022
b2	1.14	1.78	.045	.070
b3	0.76	1.14	.030	.045
c	0.20	0.36	.008	.014
D	9.02	10.16	.355	.400
D1	0.13	-	.005	-
E	7.62	8.26	.300	.325
E1	6.10	7.11	.240	.280
e	2.54 (TYP)		.100 (TYP)	
eA	7.62 (TYP)		.300 (TYP)	
eB	-	10.92	-	.430
eC	0.00	1.52	.000	.060
L	2.92	3.81	.115	.150
G	0.38 (TYP)		.015 (TYP)	

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