

T-74-13-01



GigaBit Logic

16G073

## Limiting Amplifier 18 dB Gain / 1 GHz Bandwidth

### FEATURES

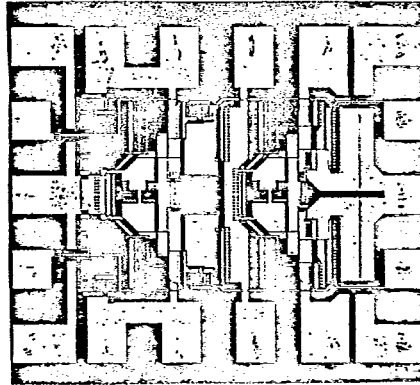
- High gain: 18 dB
- Broad Bandwidth: 1 GHz min. cut-off frequency
- Low input and output VSWR
- Low Power Dissipation: 250mW max.
- +5V Single Power Supply

### APPLICATIONS

- Fiber optic systems
- Differential Line Driver
- Differential Line Receiver
- High Speed/ High Sensitivity Comparator
- Instrumentation and measurement systems
- Capacitive Load Driver

### DESCRIPTION

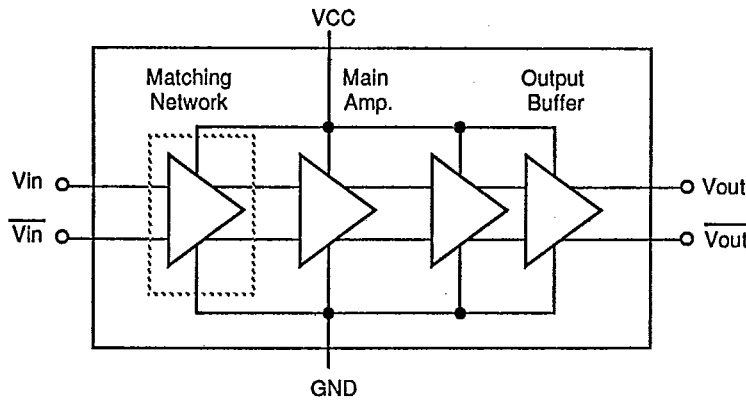
The 16G073 is a stable limiting amplifier capable of 18 dB gain min. ( $R_s = R_L = 50\Omega$ ) and a 1 GHz -3dB cut-off frequency (min.). The 16G073 has a high input level sensitivity and can easily be cascaded for higher gain. It operates from a single +5V power supply and dissipates 250mW max.



### ORDERING INFORMATION

Package Type	Speed (Min. 0°C to 70°C) 1 GHz
18-pin LCC Die	16G073-2L1 16G073-2X

### BLOCK DIAGRAM



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ABSOLUTE MAXIMUM RATINGS		
SYMBOL	PARAMETER	ABSOLUTE MAXIMUM RATINGS
VIN	Input Voltage	0 to +3.5V
VCC	Supply Voltage	-0.5 to +7V
ICC	Supply Current	70 mA
PD	Power Dissipation	490 mW
TSTOR	Storage Temperature	-55°C to +150°C
TA	Ambient Operating Temperature	-55°C to +120°C

RECOMMENDED OPERATING CONDITIONS					
PARAMETER	SYMBOL	VALUE			UNITS
		Min	Nom	Max	
Supply Voltage	VCC	4.75	5	5.25	V
Output Termination Load Resistance (AC coupled load)	Rload		50		$\Omega$
Ambient Operating Temperature	TA	0		70	°C



**ELECTRICAL CHARACTERISTICS**  
VCC = +4.75V to 5.25V, TA = 0°C to 70°C

PARAMETER	SYMBOL	TEST CONDITIONS	VALUE			UNITS
			Min	Typ	Max	
Supply Current	ICC			40	50	mA
Input Voltage	Vin		3			mV
Input Bias Point	Vthin			1.7		V
Output Bias Point	Vtho			3.3		V
Max. Single Ended Output Swing	Vos	RL = 50 $\Omega$	0.3	0.5	0.8	V
Max. Differential Output Swing	Vod	RL = 50 $\Omega$	0.6	1.0	1.6	V
VSWR (IN, OUT)	SWR	Pin = -20dBm, f = 1 MHz		1.5	1.8	
Gain	Gv	RL = 50 $\Omega$ , f = 1 MHz	18			dB
High Frequency Cut-Off (-3 dB)	Fc	RL = 50 $\Omega$	1			GHz
Rise/Fall Times	Tr, Tf	Linear Mode (Vin < 500 mV)		250		ps
	Tr, Tf	Saturation Mode (Vin $\geq$ 500 mV)		200 140		ps ps

T-74-13-01

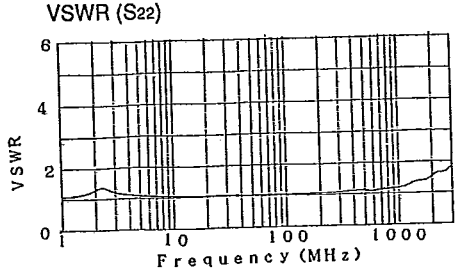
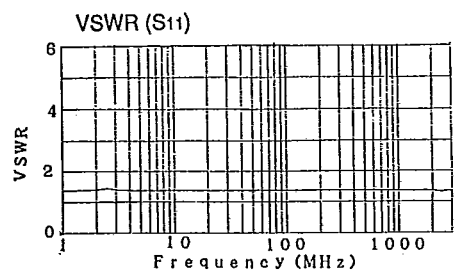
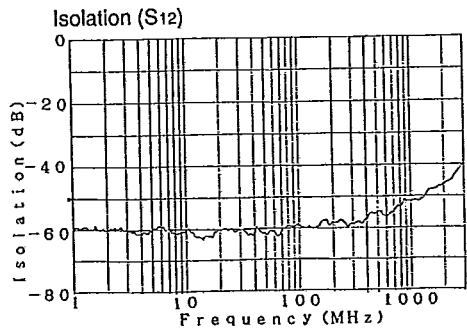
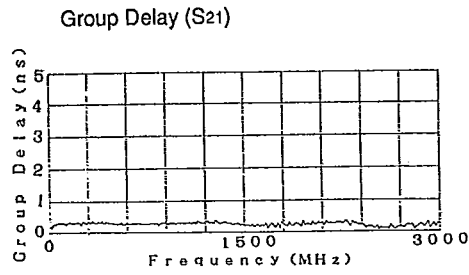
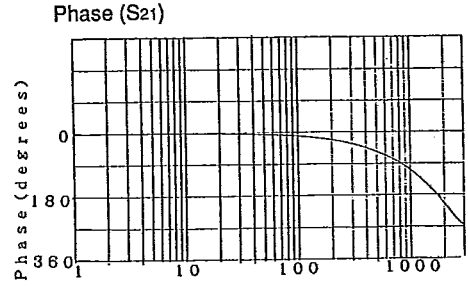
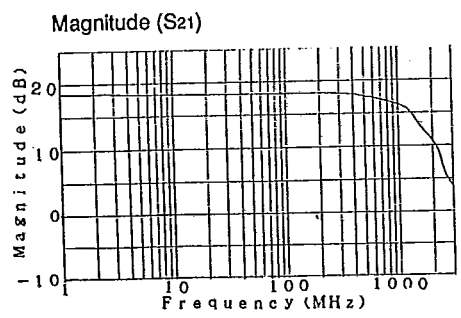


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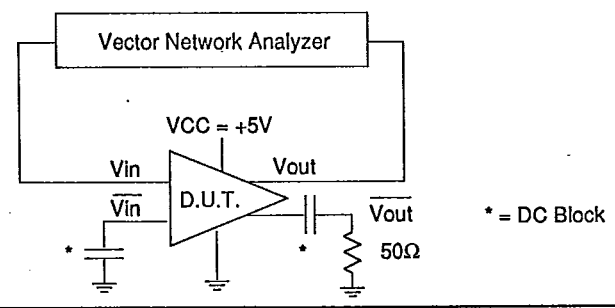
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AC CHARACTERISTICS

S-PARAMETERS



TEST CIRCUIT



T-74-13-01



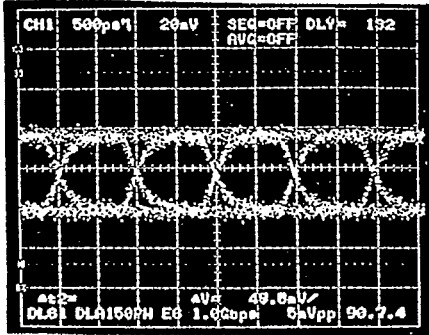
16G073

LIMITING CHARACTERISTICS

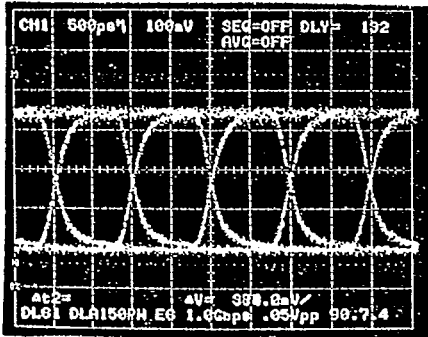
EYE PATTERN (1 Gbit/s NRZ)

Conditions: VCC = +5V

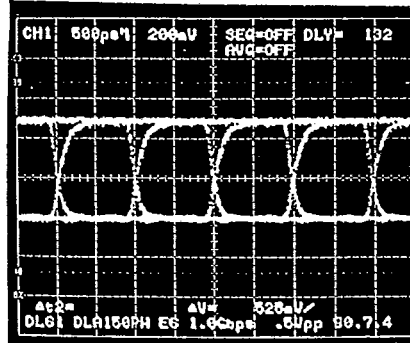
- a. Vin = 5 mVp-p
- b. Vin = 50 mVp-p
- c. Vin = 500 mVp-p



A. Horizontal: 500ps/div., Vertical: 10mV/div.



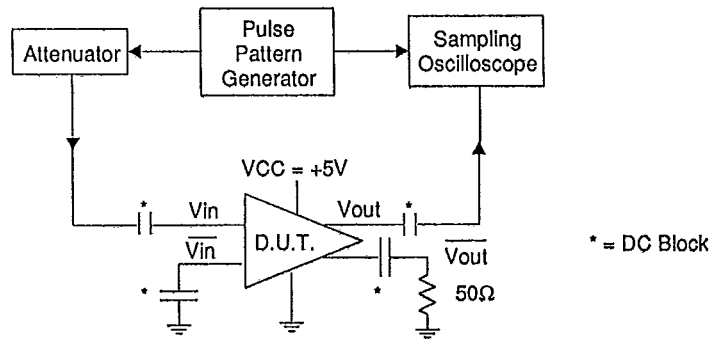
b. Horizontal: 500 ps/div., Vertical: 100 mV/div.



c. Horizontal: 500 ps/div. c Vertical: 200 mV/div.

Note: Data measured by on-chip probing

TEST CIRCUIT



5

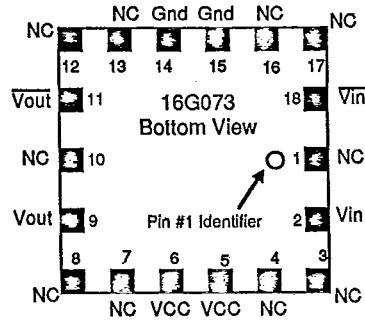
T-74-13-01



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PIN DESCRIPTION



PRECAUTIONS

Because of their small dimensions, the GaAs FETs from which the 16G073 is designed can be damaged or destroyed when subjected to large transient voltages. Such transients can be generated by power supplies when switched on if not properly decoupled. It is also possible to induce spikes from static electricity charged operators or ungrounded equipment. To prevent damage to devices from transient breakdown.

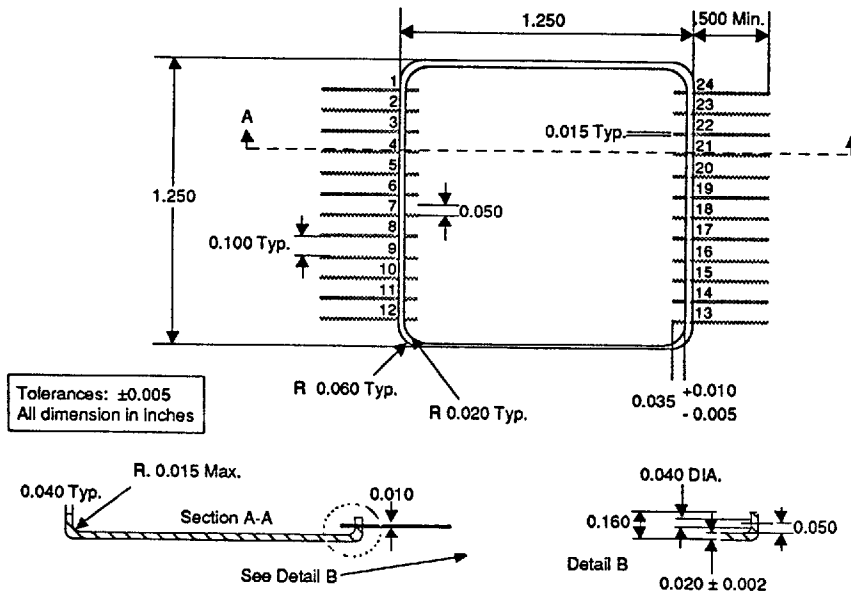
- DC ground all equipment and operators
- Avoid any voltages surges when turning on power supplies

T-90-20

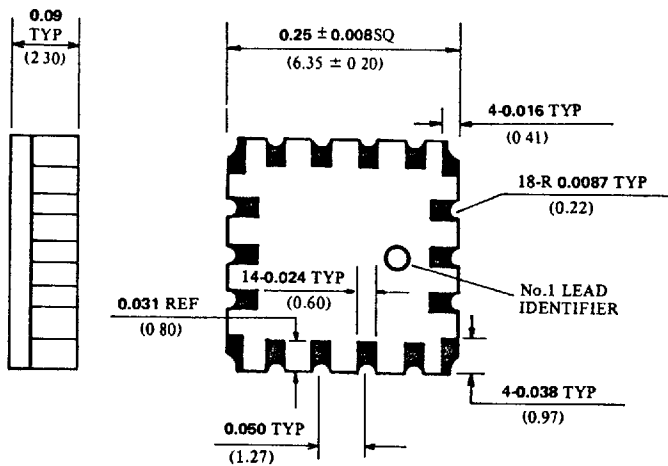


24 PIN METAL FLATPACK  
18 PIN PACKAGE

24 PIN METAL FLATPACK  
Type H



18 PIN LEADLESS CHIP CARRIER  
TYPE L1

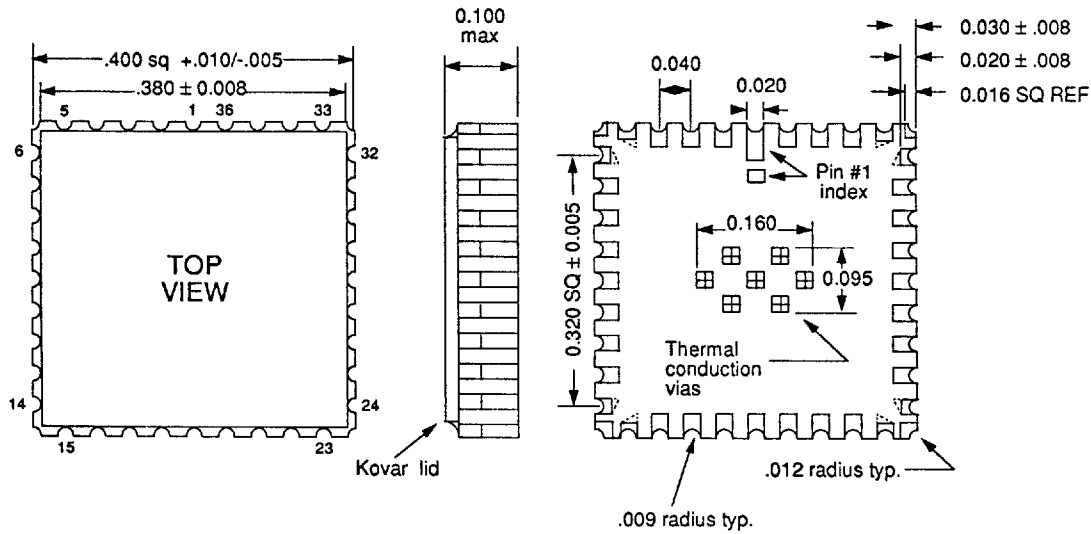


T-90-20



36 PIN PACKAGES

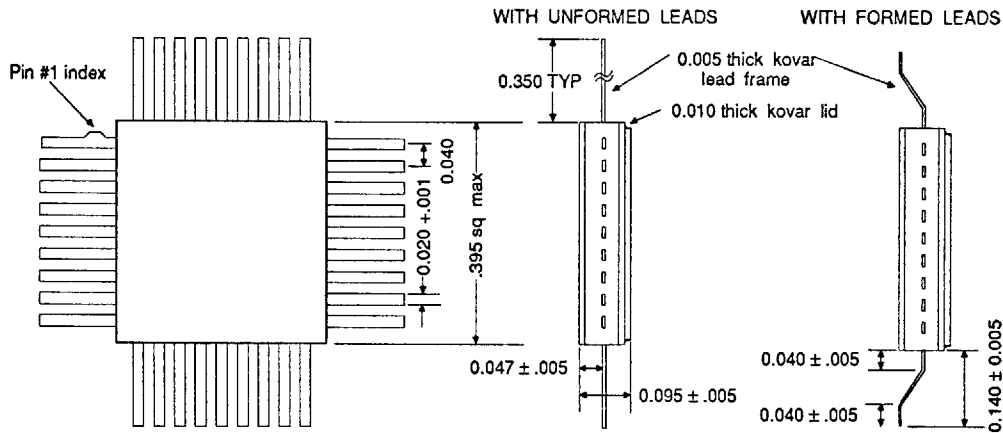
36 PIN LEADLESS CHIP CARRIER  
TYPE L36



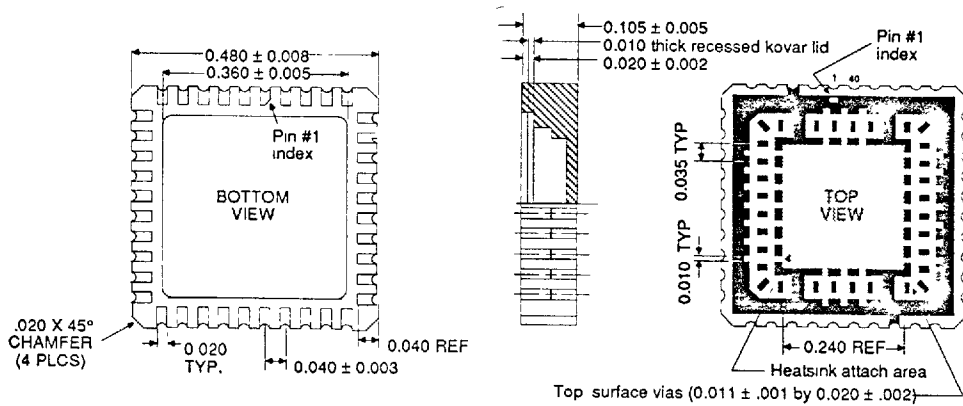
NOTES:

- 1) The package bottom thermal vias, top lid surface and 4 metallized corner castellations (when present) are all at Vss potential.
- 2) All dimensions in inches.
- 3) Pin #1 identifier may be an elongated pad or small, square gray marker.

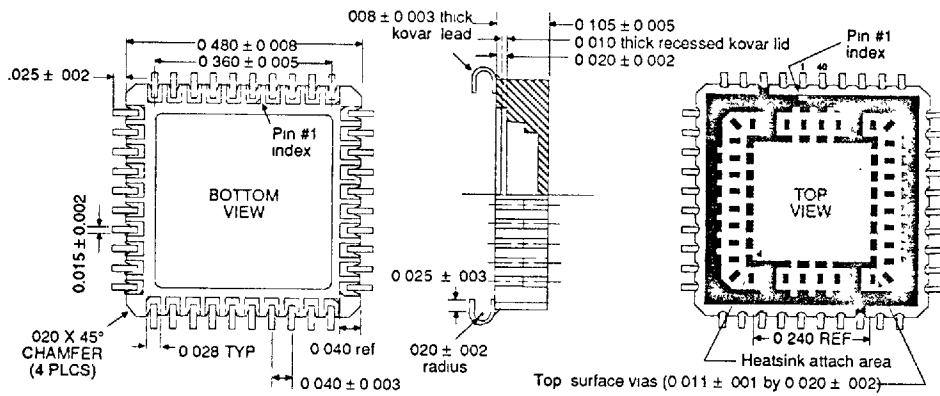
36 I/O LEAD FLATPACK  
TYPE F



**40 PIN LEADLESS CHIP CARRIER  
TYPE L**



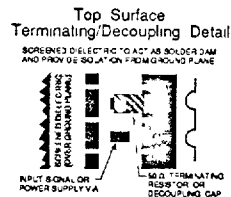
**40 PIN LEADED CHIP CARRIER  
TYPE C**



**NOTES**

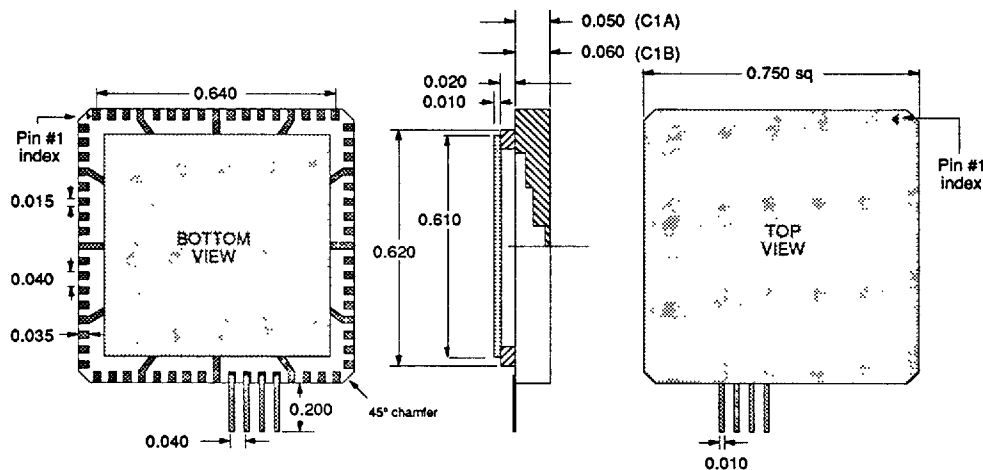
- (1) Footprint is JEDEC standard outline
- (2) Top surface vias (for terminating resistors and decoupling capacitors) are not available on pins 3, 4, 17, 18, 23, 24, 37, and 38
- (3) Top surface metal (not including vias) and pins 3 and 23 are fixed at VTT potential
- (4) Recommended top surface chip resistors are 0.040 long by 0.020 wide by 0.010 thick typ. 100 mw min. nominal power rating (Mini-Systems MSR 21 or equivalent)
- (5) Recommended top surface chip capacitors are 0.040 long by 0.030 wide by 0.020 thick typ. 25V VCCW 1000 of min. (Johnson R09 caps or equivalent)
- (6) Recommended heat-sinks are GBL P/Ns 90GHS 40 A and 90GHS 40 B
- (7) Thermally conductive, electrically non-conductive epoxy is recommended for heatsink attachment (Ablestick 789 4 or 561K, or Thermalloy Therabond™ or equivalent)
- (8) L40 and C40 packages are dimensionally identical except for contact finger width

TOP SURFACE LEGEND	
Metalized Ceramic	
Screened Dielectric	
Bare Ceramic	



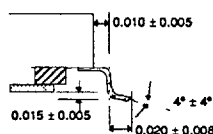


**68 PIN LEADED CHIP CARRIER  
TYPE C1**



1. All dimensions in inches.
2. C1A PACKAGE: Package lid, top, and pins 4, 9, 14, 21, 26, 31, 38, 43, 48, 55, 60, 65 are at common potential (system ground).
3. C1B PACKAGE: Package lid and pins 4, 9, 14, 21, 26, 31, 38, 43, 48, 55, 60, 65 are at common potential (system ground).
4. Tolerance on all dimensions is  $\pm 1\%$  but not larger than  $\pm 0.005$ . Tolerance on 0.640 end pad to end pad dimension is  $\pm 0.003$ .

**GULLWING LEADS**



**132 PIN LEADED CHIP CARRIER  
TYPE C3**

