

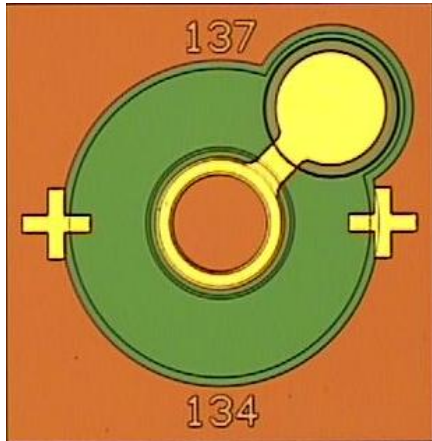


# 2.5Gbps APD Chip for GPON Application

P/N: DO198\_55um\_APD



Known Good Die



## Introduction

This high performance product is a 2.5G APD (avalanche photodiode) chip that features a large 55 $\mu$ m front-side illuminated detection window for easy optical assembly. This product has an excellent reliability, low dark current at operating voltage, and high sensitivity up to -34dBm with a low-noise TIA. It is designed primarily to be used at 1310nm and 1490nm APD-TIA GPON applications that enable data transmission for today's fiber-to-the-home (FTTH) market.

## Key Features

- GCS proprietary design and process technologies
- 55 $\mu$ m optical detection window
- Backside common cathode and topside anode
- -33dBm typical sensitivity with low-noise TIA
- -40C to 85C operation range
- High reliability with GCS robust 4" wafer manufacturing with fast cycle-time
- Deliverable in GCS Known Good Die™ with 100% testing and inspection
- Customized layout dimensions available
- RoHS compliant

## Applications

- 2.5Gbps GPON receiver
- SONET OC48
- Ethernet

## SPECIFICATIONS (T=25C<sup>0</sup>)

	Conditions	Min.	Typical	Max.	Unit	Notes
<b>Responsivity</b>	@ 1310 and 1550 nm, $V_{br}$ -2V, M=1	-	0.87	-	A/W	
<b>Breakdown Voltage (<math>V_{br}</math>)</b>	$I_d$ =10uA	40	47	50	V	
<b>Temperature coefficient of <math>V_{br}</math></b>			0.09		V/°C	
<b>Dark current</b>	$V_{br}$ -2V	-	1.3	20	nA	
<b>Gain</b>	$V_{br}$ -2V, $P_o$ =1uW	9	10	-		
<b>Bandwidth</b>	M=9, $P_o$ =1uW	2.5	-	3.2	GHz	
<b>Capacitance</b>	$V_{br}$ -2V, f=1 MHz	-	0.4	0.6	pF	
<b>Wavelength range</b>		1200	1490	1600	nm	

## Global Communication Semiconductors, LLC

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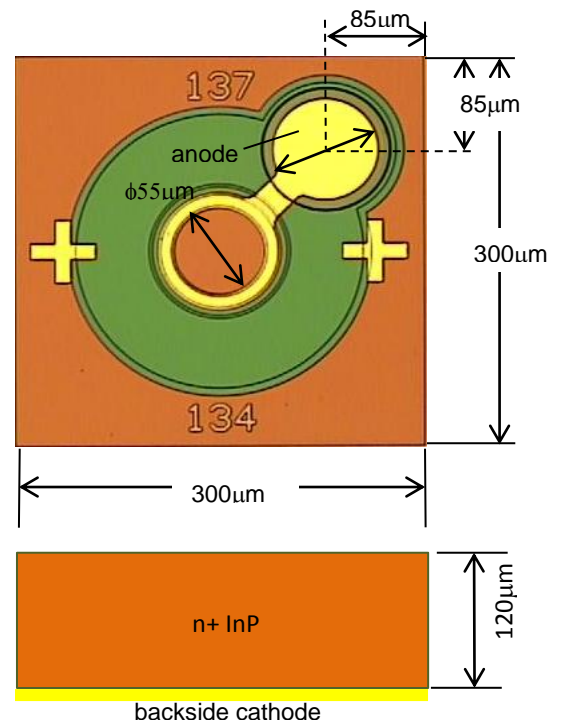
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### ABSOLUTE MAXIMUM RATING

Parameter	Rating
Operating Temperature	-40°C to 85°C
Storage Temperature	-40°C to 125°C
Soldering Temperature	260°C / 10 sec

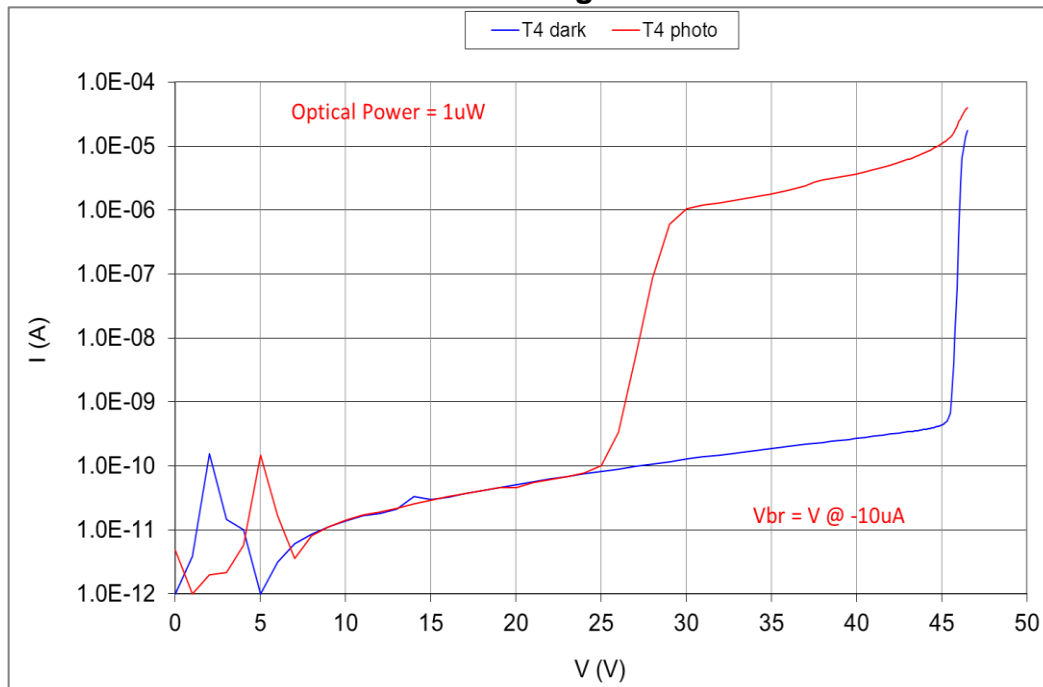
### DIMENSIONS

(Unit: $\mu\text{m}$ )	Min.	Typical	Max.
Detection window		55	
Bonding pad diameter		65	
Die height	110	120	130
Die width	290	300	310
Die length	290	300	310



### Typical Performance of GCS's Do198\_55um\_APD

#### Current - Voltage Curve



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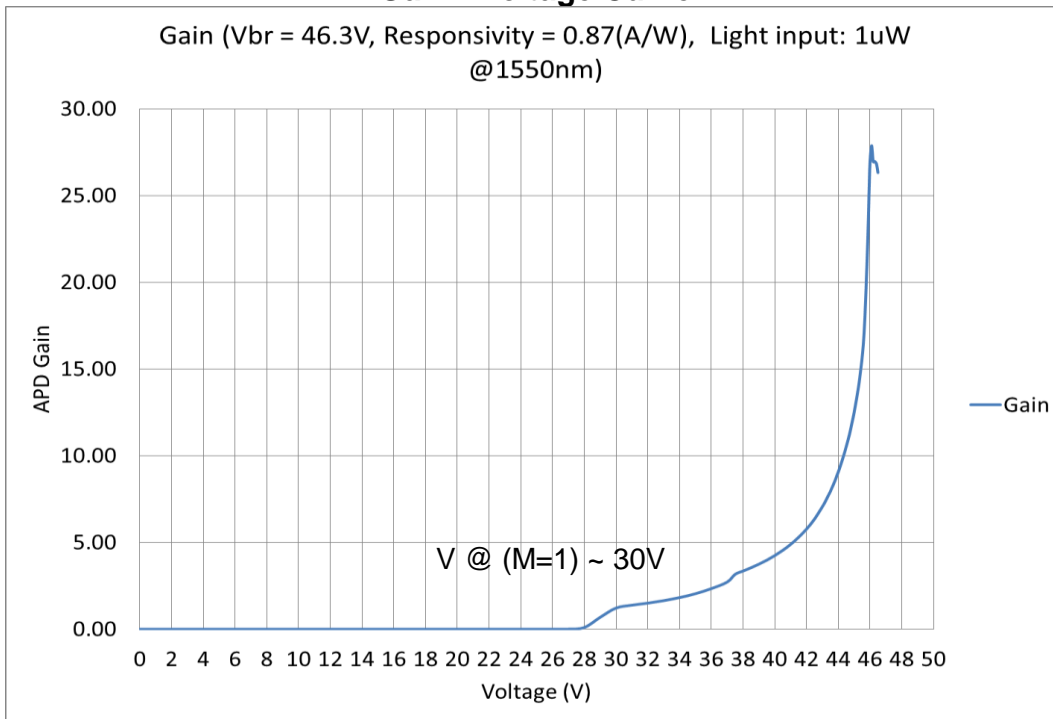
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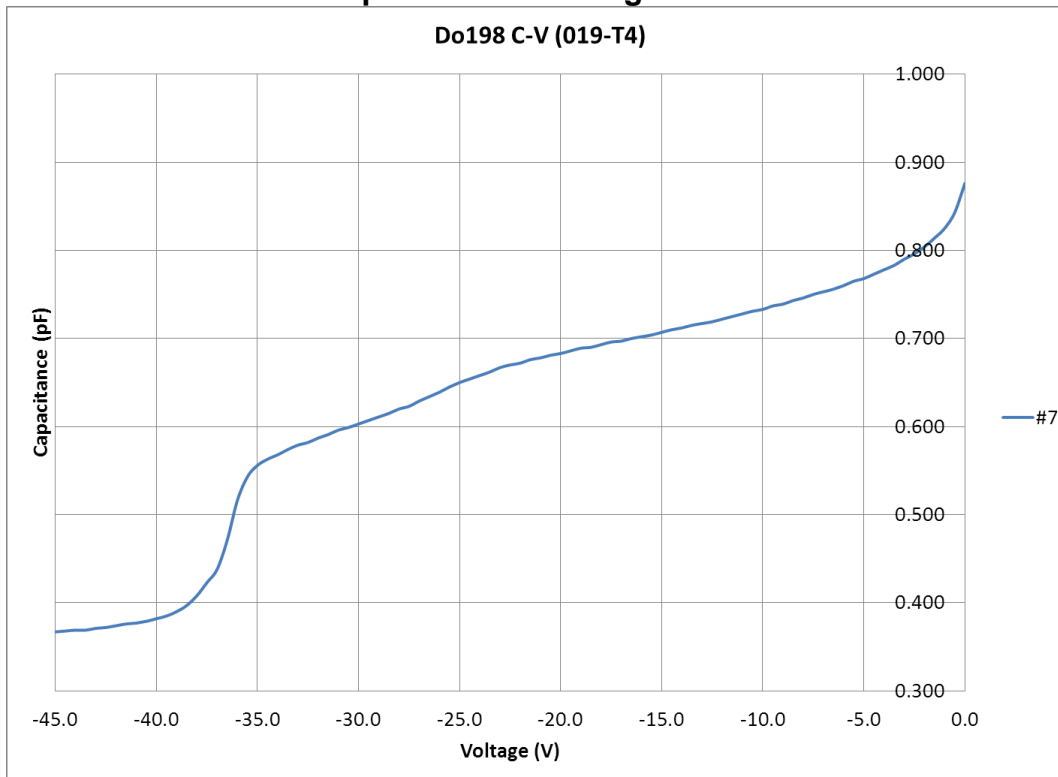


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### Gain - Voltage Curve



### Capacitance - Voltage Curve



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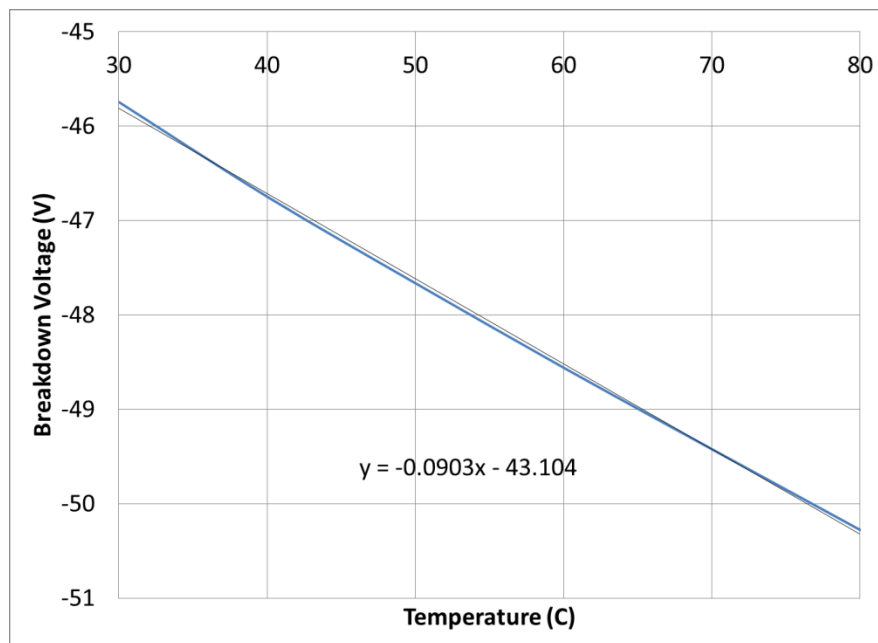
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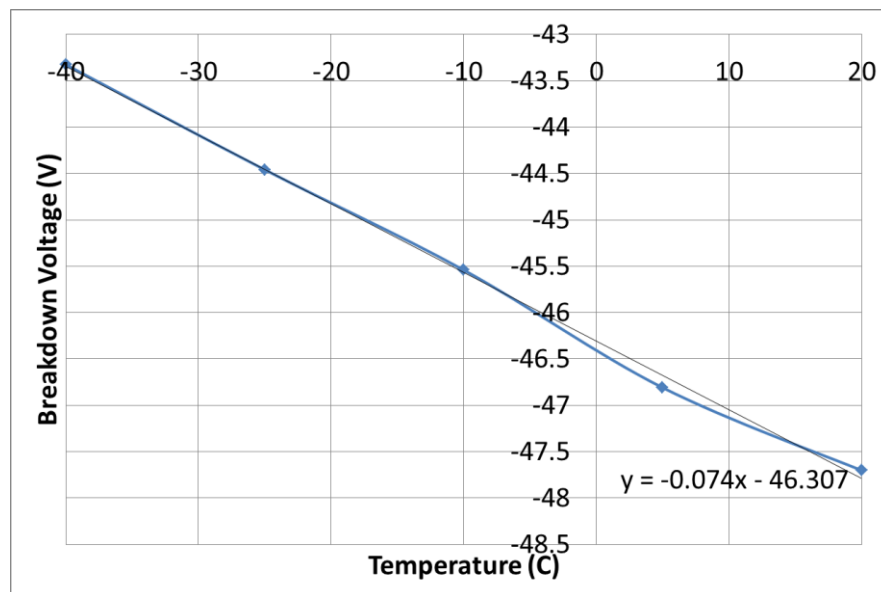


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### Breakdown Voltage - Temperature



High temperature



Low temperature

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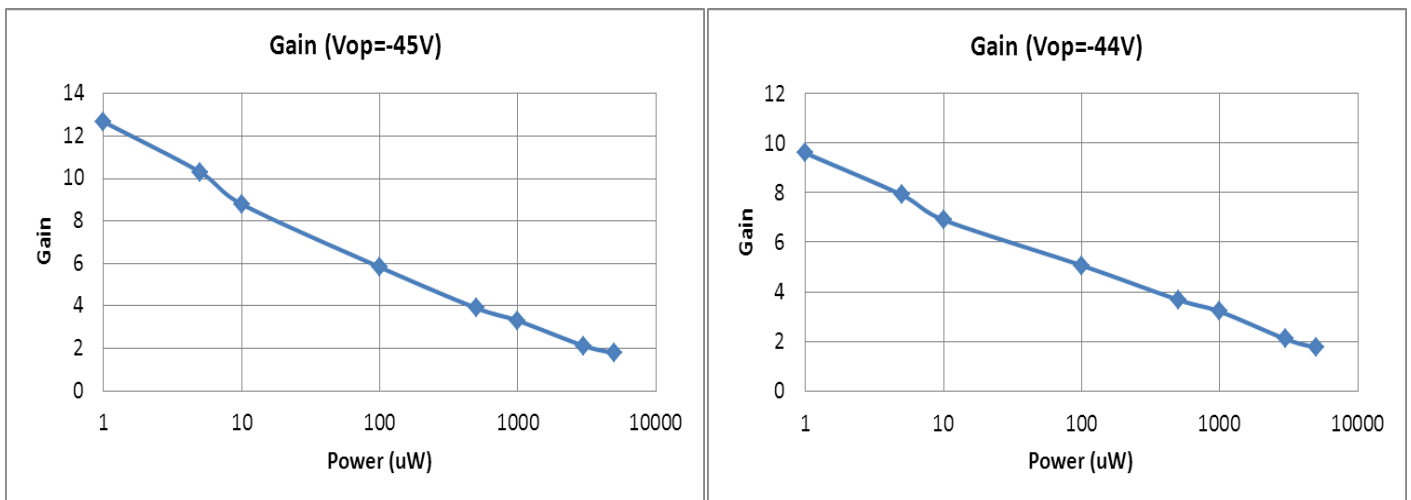
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### Bandwidth vs. Voltage & Gain

Vop	-43V	-44V	-45V
M	7.07	9.07	12.5
Bandwidth	3.3GHz	3.3GHz	3.25GHz

### Gain - Power Curve



#### About GCS:

GCS has a long history manufacturing and shipping both GaAs and InGaAs based photo diodes since 2000. Our state of art manufacturing facility is located in Torrance, California, and has about 10,000 square feet of fab space with a capability of about 1200 4-inch wafers per month and expandable to 2000 wafers per month. GCS as a world-class semiconductor device manufacturer has been delivering a total of over 30 million photo diodes with various date rates and applications used for optical communications, which have been deployed in field by top tier optical transceiver companies worldwide. ■

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