



APIC's Direct Modulated DFB Laser Performance

Measured Chip Performance

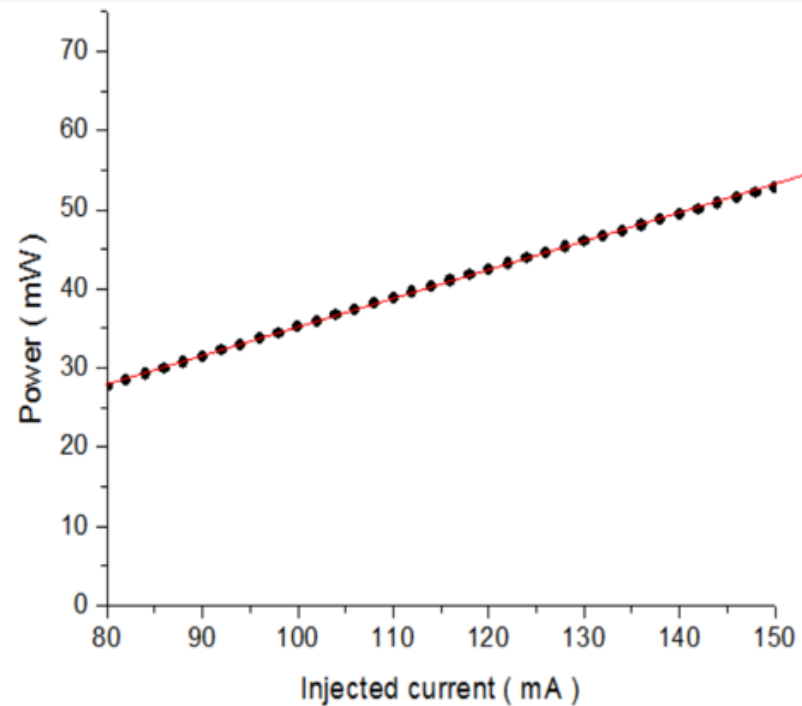
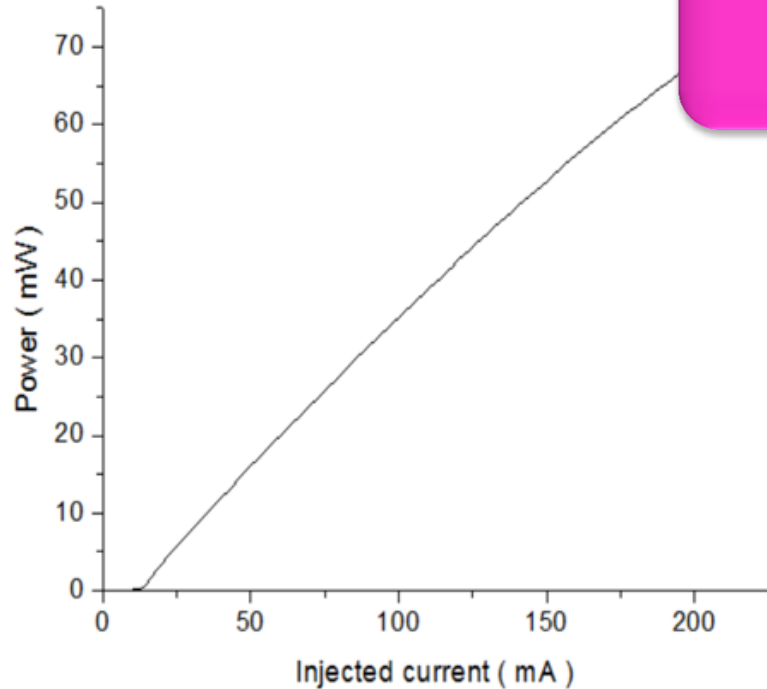


Main Parameters	Symbol	Min.	Typ.	Max.	Units
Wavelength λ	λ	1530	1550	1565	nm
Output power	P	50	60	70	mW
Threshold current	I_{th}	9	10	12	mA
Relative intensity noise	RIN		-160	-150	dB/Hz
Side-mode suppression ratio	SMSR	35	50		dB
3 dB band width f_{3dB}	f_{3dB}		10		GHz
Third order intercept point	IIP3	35	40		dBm
Spurious-free dynamic range	SFDR		119		dB \cdot Hz ^{2/3}

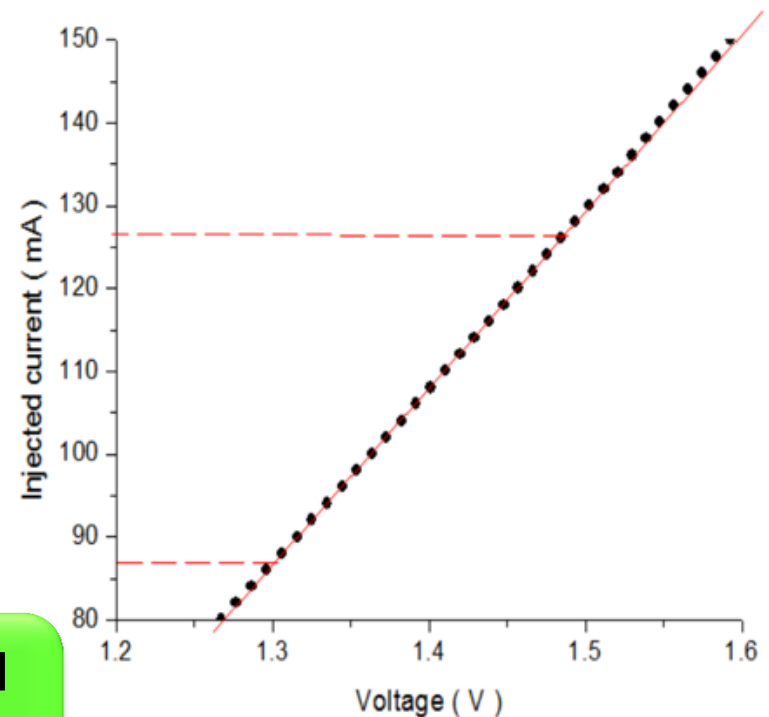
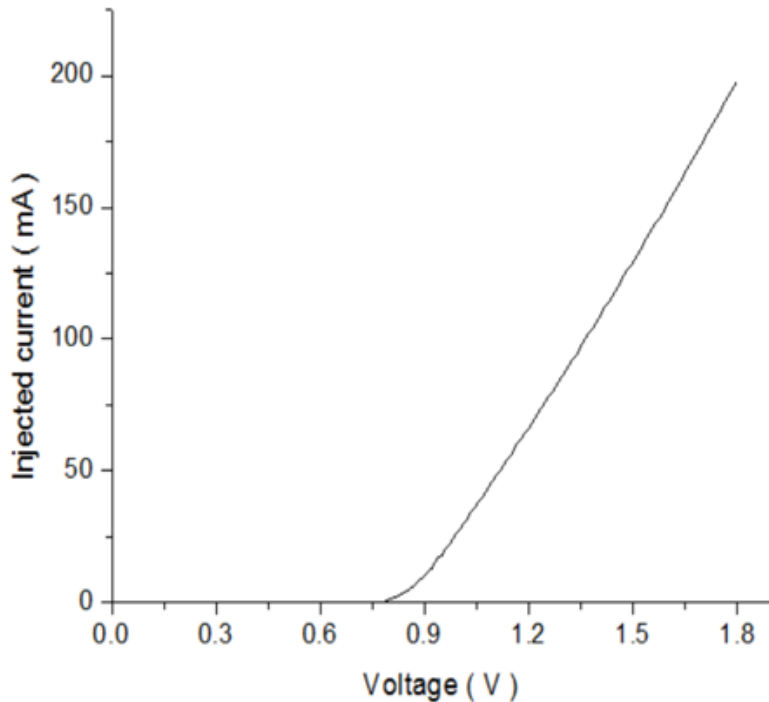
Measured Laser P-I and Linear Range



High linearity enables a high IIP3 and supports high order modulation; good for QAM

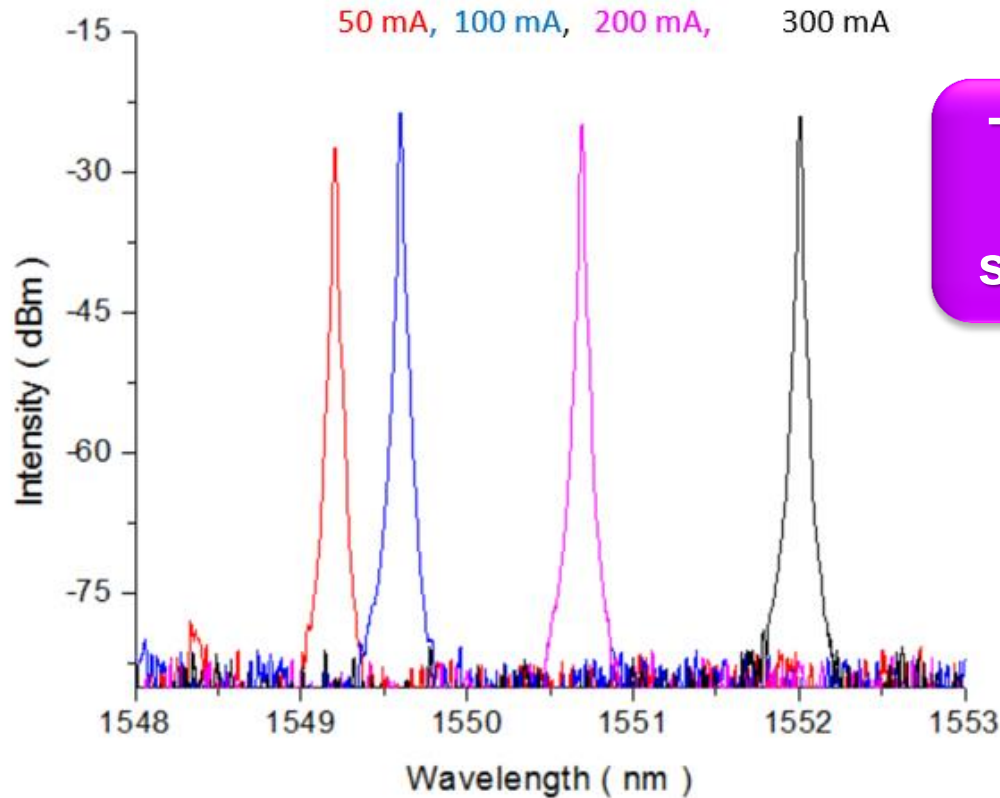


Measured Laser I-V and Linear Range



High linearity enables a high IIP3 and supports high order modulation; good for QAM

Measured Laser Spectrum



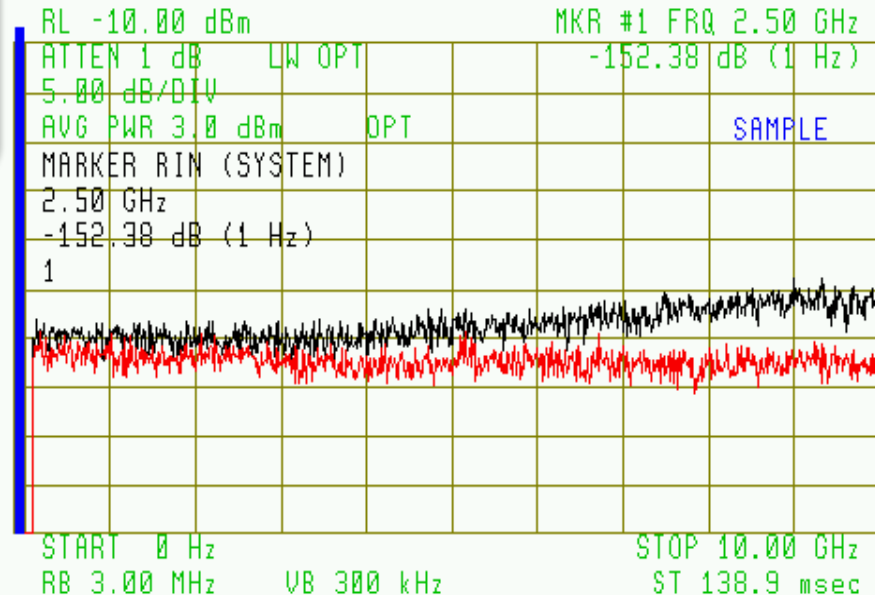
These lasers exhibit very high side mode suppression ratio (SMSR)

Measured Laser RIN at Bias of 150 mA

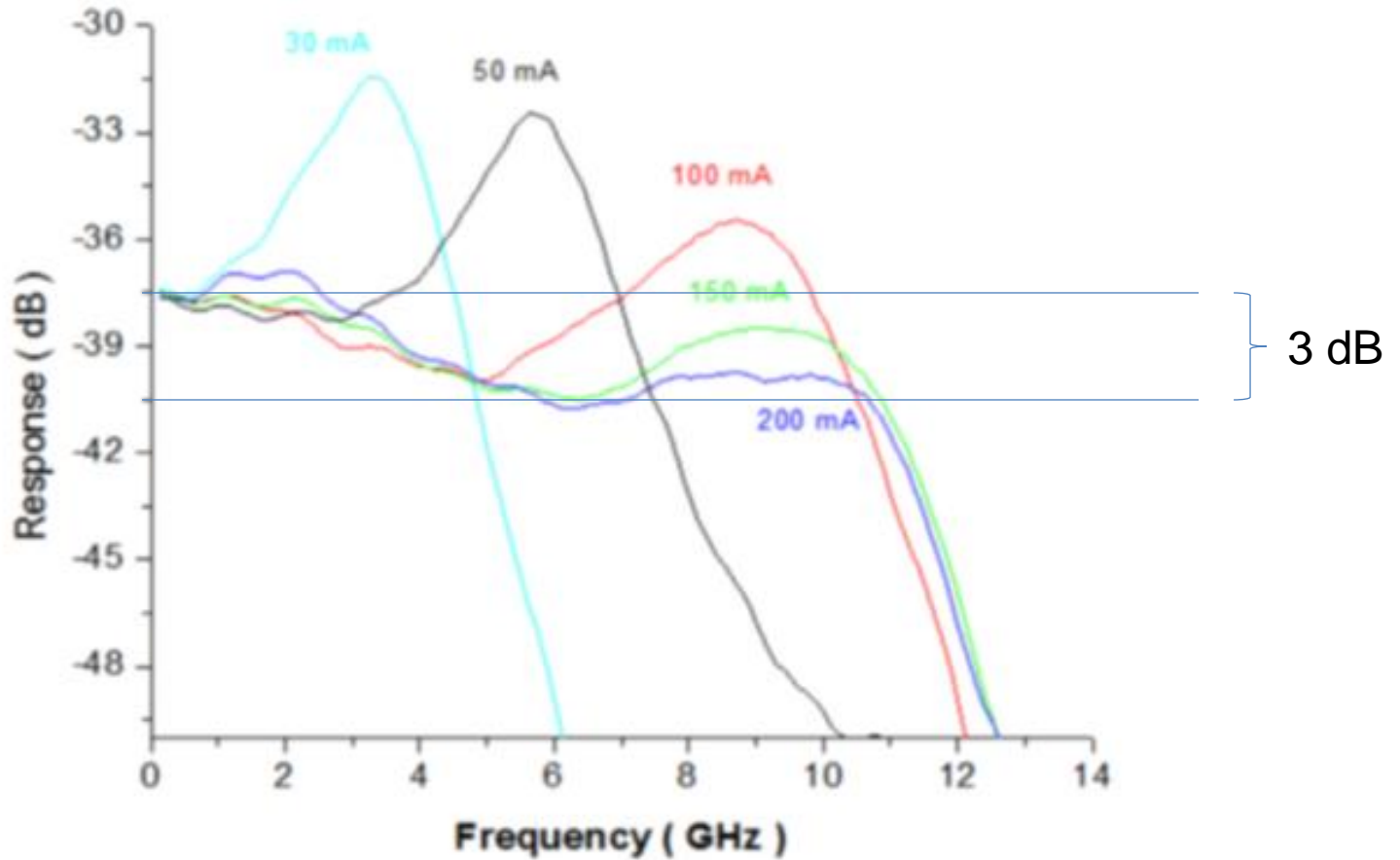
Very low RIN contributes to a low noise figure (NF) and high dynamic range

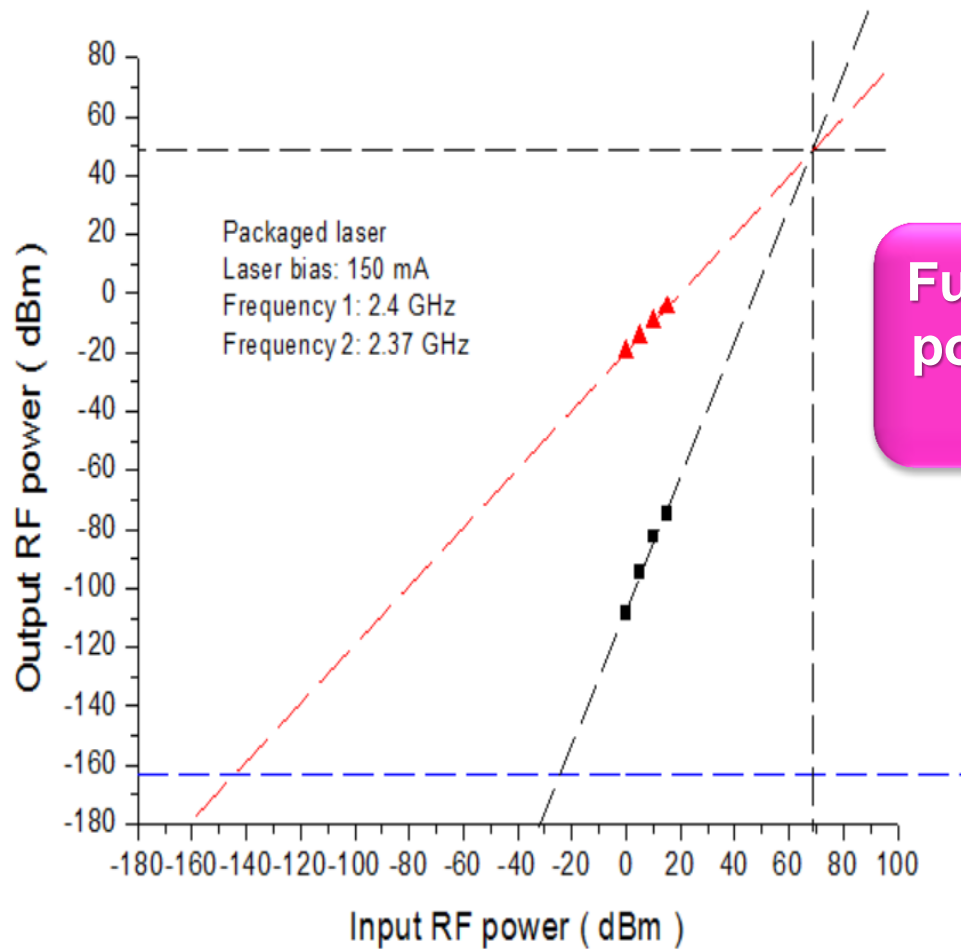
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RIN (Laser)	= -162.86 dB/Hz
— RIN (System)	= -152.39 dB/Hz
— Thermal Noise Term	= -155.55 dB/Hz
— Shot Noise Term	= -156.88 dB/Hz



Measured Frequency Response





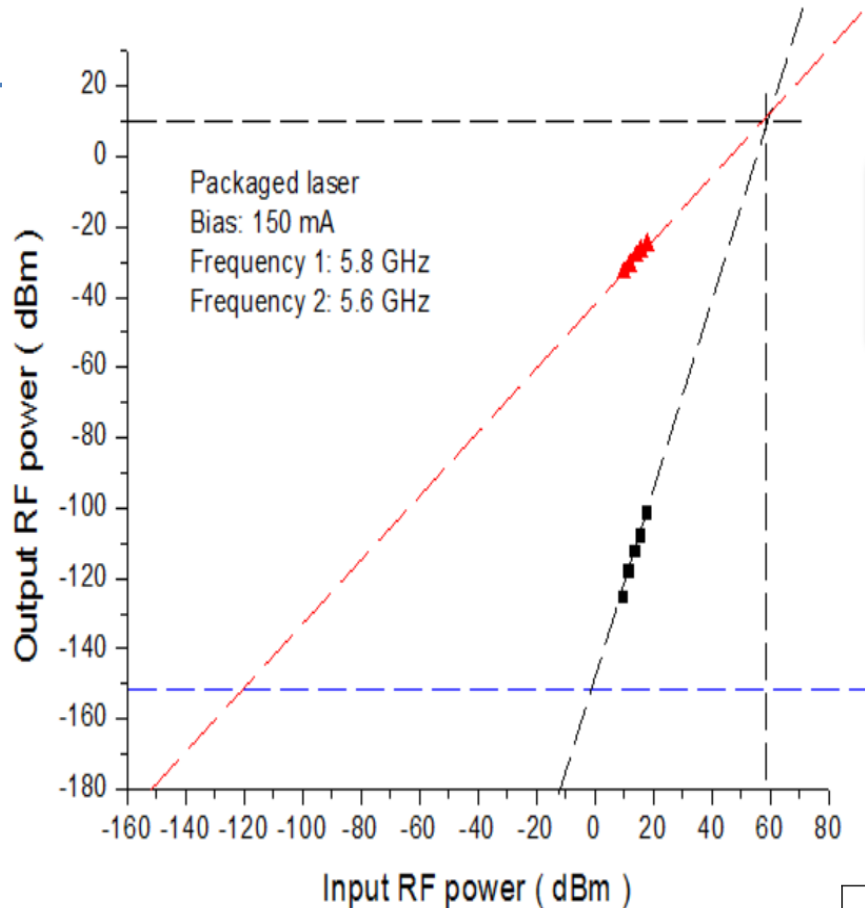
Fundamental and IMD3 RF output powers as a function of input RF power at 2.4 GHz

IIP3=68 dBm
 OIP3=48 dBm
 SFDR=120 dB • Hz^{2/3}

Exceptional performance for numerous applications such as high order modulation signal transmission (QAM) and high fidelity analog RF over fiber

Test data

RF power	2.4 GHz		2.37 GHz			Ave. RF power	Ave. 1 st power	Ave. 3 rd power
	1 st power	3 rd power	RF power	1 st power	3 rd power			
0	-19.4	-108	0	-19.8	-109	0	-19.6	-108.5
5	-14.5	-94	5	-14.5	-95	5	-14.5	-94.5
10	-9.3	-83	10	-9.4	-82	10	-9.35	-82.5
15	-4.56	-76.4	15	-4.68	-73	15	-4.62	-74.7



Fundamental and IMD3 RF output powers as a function of input RF power at 5.8 GHz

IIP3=58 dBm

OIP3=10 dBm

SFDR=119 dB • Hz^{2/3}

Test data

RF power	5.8 GHz		5.6 GHz			Ave. RF power	Ave. 1 st power	Ave. 3 st power
	1 st power	3 st power	RF power	1 st power	3 st power			
10	-33	-126	10	-33	-125	10	-33	-125.5
12	-31	-118	12	-31	-118	12	-31	-118
14	-28.5	-113	14	-28.5	-112	14	-28.5	-112.5
16	-26.7	-109	16	-27	-107	16	-26.85	-108
18	-25	-103	18	-25	-100	18	-25	-101.5



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