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SEMICONDUCTOR

PRODUCT CATALOG FALL 2023

High performance RF GaN products for 5G telecommunications, radar, ISM and multi-market applications.

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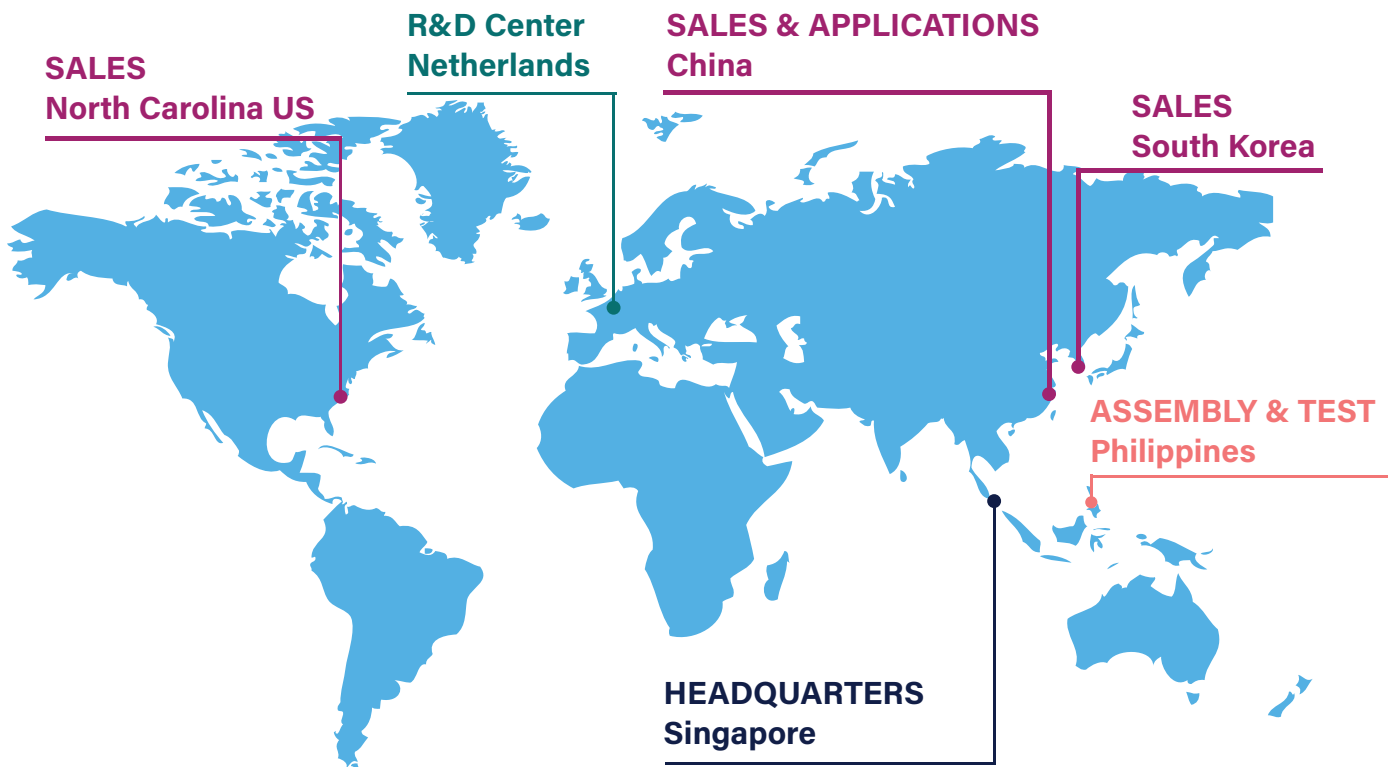


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RF GaN for High Performance Applications



Global Footprint with Local Presence

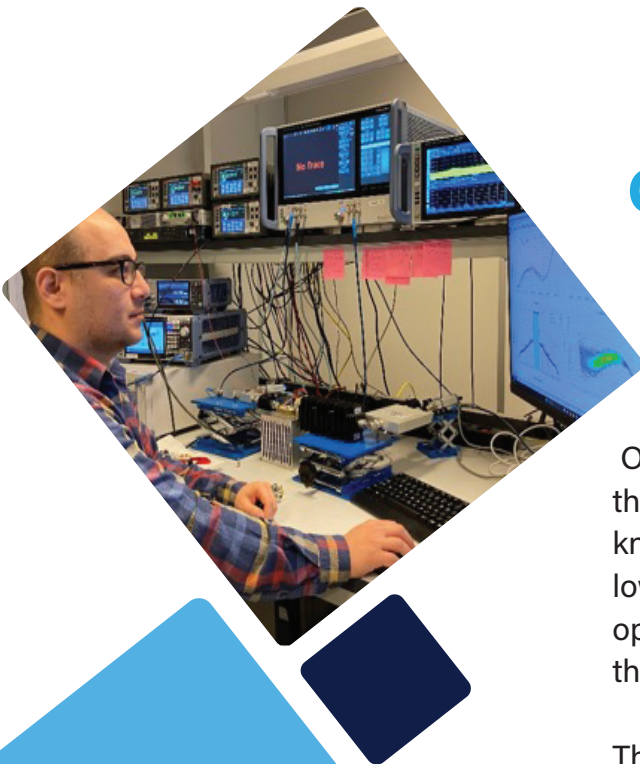


About Gallium Semiconductor

Gallium Semiconductor designs and manufactures Gallium Nitride (GaN) and Gallium Arsenide (GaAs) based RF semiconductor products to cost effectively deliver the highest performance and efficiency for 5G communication networks as well as aerospace, radar, industrial, scientific and medical applications.

Founded in 2021, we are a global company with headquarters in Singapore and a world class R&D engineering team in Europe. We operate our own production line in the Philippines and applications centers in the Netherlands, China and Singapore.

- ✓ High performance GaN & GaAs products for RF and microwave applications
- ✓ Team of experienced RF semiconductor industry experts
- ✓ HQ in Singapore, R&D in Europe, and worldwide sales
- ✓ Comprehensive and responsive applications engineering support



Our Unique Advantage

Our company takes a distinctive approach in design, packaging and application support to produce leading edge high-power GaN RF power products.

Our RF power amplifiers are designed using breakthrough GaN technology and innovative RF design know-how resulting in the highest efficiency achieving lowest power consumption. Coupled with thermally optimized packages, this produces compact solutions that are smaller in size than others in the market.

These unique advantages, combined with our rigorous testing and assembly process in our dedicated back-end line, allow us to deliver high quality products that offer world-class performance and reliability.

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GaN-on-SiC technology offers many advantages for RF applications, including higher efficiency, higher power density, higher operating frequency, wider bandwidth, and better thermal performance. These advantages make it a highly attractive technology for various RF applications.

Gallium Semiconductor offers both GaN bare die and packaged devices in leadless plastic, air cavity plastic and air cavity ceramic packages.

GaN Bare Die

Our bare die GaN-on-SiC HEMTs are designed for optimal thermal behaviour and ideal for designing hybrids and modules. These offer maximum flexibility for customization of RF Power Amplifier performance.

50V GaN-on-SiC Bare Die upto C-Band						
Part Name	Frequency (GHz)	Psat (W)	Linear Gain (dB)	Efficiency (%)	Voltage (V)	Die Size (mm)
GD010	DC-8.0	10	20	61	50	0.90 x 0.75
GD020	DC-7.0	20	21	63	50	1.26 x 0.75
GD030	DC-6.0	30	21	64	50	1.63 x 0.75
GD060	DC-3.7	60	21	64	50	2.35 x 0.75
GD080	DC-3.7	80	21	66	50	2.74 x 0.82
GD090	DC-3.7	90	22	67	50	3.08 x 0.75
GD135	DC-3.2	135	19	66	50	3.48 x 0.80
GD160	DC-3.2	160	19	65	50	3.50 x 0.90
GD200	DC-2.7	200	15	64	50	3.50 x 0.90
GD250	DC-2.7	250	15	64	50	5.50 x 0.90

General Purpose Broadband Amplifiers in DFN and ACC Packages

We offer a series of high performance GaN-on-SiC discrete HEMTs with excellent reliability and high efficiency. Transistors are available in plastic overmold and air cavity ceramic (ACC) packages with RoHS compliance.

Discrete Wideband GaN Amplifiers in DFN

Part Name	Frequency (GHz)	Psat (W)	Linear Gain (dB)	Efficiency (%)	Voltage (V)	Package
GT010D	DC-8.0	15	19	62	50	DFN 3x6
GT012D	DC-12.0	12	21	66	28	DFN 3x6
GT020D	DC-7.0	30	19	64	50	DFN 3x6
GT030D	DC-6.0	50	21	65	50	DFN 3x6
GT065D	DC-3.7	80	21.9	66	50	DFN 3x6
GT090D	DC-3.7	120	21.6	66	50	DFN 3x6
GT135D	DC-3.2	150	19	64	50	DFN 3x6

Discrete Wideband GaN Amplifiers in ACC

Part Name	Frequency (GHz)	Psat (W)	Linear Gain (dB)	Efficiency (%)	Voltage (V)	Package
GTH0-0080015S	DC-8.0	15	20	63	50	NI-200
GTH0-0070030S	DC-7.0	30	19	68	50	NI-200
GTH0-0060050S	DC-6.0	50	19	66	50	NI-360
GTH0-0037110S	DC-3.7	110	21	65	50	NI-360
GTH0-0032150S	DC-3.2	150	18	70	50	NI-360
GTH0-0032180P	DC-3.2	180	18	66	50	NI-650

Unless otherwise noted, specifications are typical performance measured from packaged devices in a test fixture.

[1] Specifications are target performance values based on simulations.

Please contact sales@galliumsemi.com for availability of sample parts.

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Pulsed Radar Amplifiers

Our pulsed RF GaN amplifiers deliver performance and reliability to address critical demands of radar systems across commercial and military aviation, air traffic control, weather services, satellite communications, and more. Our innovative solutions enable customer advantages in size, weight, and power.

L- and S-Band Pulsed Radar Amplifiers

Part Name	Frequency (GHz)	Psat (W)	Linear Gain (dB)	Efficiency (%)	Voltage (V)	Package
GTH2r-1014150S	1.0-1.4	150	18	75	50	DFN 6.5x7
GTH2r-1214500P ^[1]	1.2-1.4	500	18	66	50	ACP-800
GTH2r-0912500P ^[1]	0.96-1.215	500	18	66	50	ACP-800
GTH2r-1010700P ^[1]	1.03-1.09	700	20	70	50	ACP-800
GTH2r-2731125S	2.7-3.1	125	15	63	50	ACP-462
GTH2r-2731150S	2.7-3.1	150	17	67	50	DFN 6.5x7
GTH2r-2731250S ^[1]	2.7-3.1	250	15.5	64	50	ACP-462
GTH2r-2731500P ^[1]	2.7-3.1	500	17	65	50	ACP-800
GTH2r-2933150S ^[1]	2.9-3.3	150	16	63	50	DFN 6.5x7
GTH2r-3135125S	3.1-3.5	125	15	56	50	ACP-462
GTH2r-3135250S ^[1]	3.1-3.5	250	16	65	50	ACP-462
GTH2r-3135500P ^[1]	3.1-3.5	500	16	65	50	ACP-800

C- and X-Band Pulsed Radar Amplifiers ^[1]

Part Name	Frequency (GHz)	Psat (W)	Linear Gain (dB)	Efficiency (%)	Voltage (V)	Package
GAM2r-5060050S	5.0-6.0	50	20	47	40	LGA 10x12
GAM2r-6010015S	6.0-10.0	15	13	45	40	LGA 5x6
GAM2r-9199050S	9.1-9.9	50	14	51	40	LGA 5x6
GAM2r-9199100S	9.1-9.9	100	22	42	40	LGA 10x12

ISM CW Amplifiers

GaN technology's ability to operate at high frequencies and deliver high output power with high efficiency makes it ideal for numerous ISM applications. Our GaN-on-SiC based RF power amplifiers are suitable for ISM CW applications.

L- and S-Band ISM CW Amplifiers ^[1]

Part Name	Frequency (GHz)	Psat (W)	Linear Gain (dB)	Efficiency (%)	Voltage (V)	Package
GTH2e-2425300P	2.4-2.5	300	18	73	50	ACP-800
GTH2e-2425600P	2.4-2.5	600	17	73	50	ACP-1600

Telecommunications Infrastructure

We offer an extensive portfolio of GaN-on-SiC power transistors for use in the design of 5G telecommunication systems supporting all global standards and frequency bands and power levels. Key features include high-power Doherty designs, ease of use with DPD systems, and air-cavity and plastic package options.

Dual Path Asymmetrical Doherty in DFN for MIMO Applications ^[1]

Part Name	Frequency (GHz)	Psat (W)	Pave (W)	Linear Gain (dB)	Efficiency (%)	Voltage (V)	Package
GTH0-3338050A	3.3-3.8	50	7	15	52	50	DFN 6.5x7
GTH0-2327050A	2.3-2.7	50	7	16	57	50	DFN 6.5x7
GTH0-3742050A	3.7-4.2	50	7	14	50	50	DFN 6.5x7
GTH0-3742100A	3.7-4.2	100	14	13.5	48	50	DFN 6.5x7
GTH0-3338100A	3.3-3.8	100	14	14	51	50	DFN 6.5x7
GTH0-2327100A	2.3-2.7	100	14	15	57	50	DFN 6.5x7
GTH0-4450035A	4.4-5.0	35	5	13	44	50	DFN 6.5x7
GTH0-4450070A	4.4-5.0	70	7	13	42	50	DFN 6.5x7

Dual Path Asymmetrical Doherty in ACC for Macro Applications ^[1]

Part Name	Frequency (GHz)	Psat (W)	Pave (W)	Linear Gain (dB)	Efficiency (%)	Voltage (V)	Package
GTH0-2327400A	2.3-2.7	400	56	15	53	50	ACP-800
GTH0-3338450A	3.3-3.8	450	56	13	45	50	ACP-800
GTH0-3742450A	3.7-4.2	450	56	12	43	50	ACP-800
GTH0-2327600A	2.3-2.7	600	85	14	49	50	ACP-800
GTH0-3338650A	3.3-3.8	650	85	12.5	43	50	ACP-800
GTH0-4450500A	4.4-5.0	500	56	11.5	40	50	ACP-800

Discrete Dual Path GaN Driver in DFN for Macro Applications ^[1]

Part Name	Frequency (GHz)	Psat (W)	Pave (W)	Linear Gain (dB)	Efficiency (%)	Voltage (V)	Package
GTH0-2327060P	2.3-2.7	60	6	18	14	50	DFN 6.5x7
GTH0-2327090P	2.3-2.7	90	9	18	12	50	DFN 6.5x7
GTH0-2327140P	2.3-2.7	140	14	17	10	50	DFN 6.5x7
GTH0-3338060S	3.3-3.8	60	6	17	13	50	DFN 6.5x7
GTH0-3338090S	3.3-3.8	90	9	16	12	50	DFN 6.5x7
GTH0-3338140S	3.3-3.8	140	14	15	11	50	DFN 6.5x7

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[1] Specifications are target performance values based on simulations.

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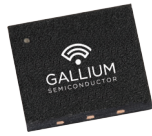
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Package Portfolio

Dual Flat No-Lead (DFN) Plastic Packages



DFN 3x6mm



QFN 6.5x7mm

Air Cavity Plastic (ACP) Packages



ACP-462-2L



ACP-800-4L



ACP-800-2L

Air Cavity Ceramic (ACC) Packages



NI-200

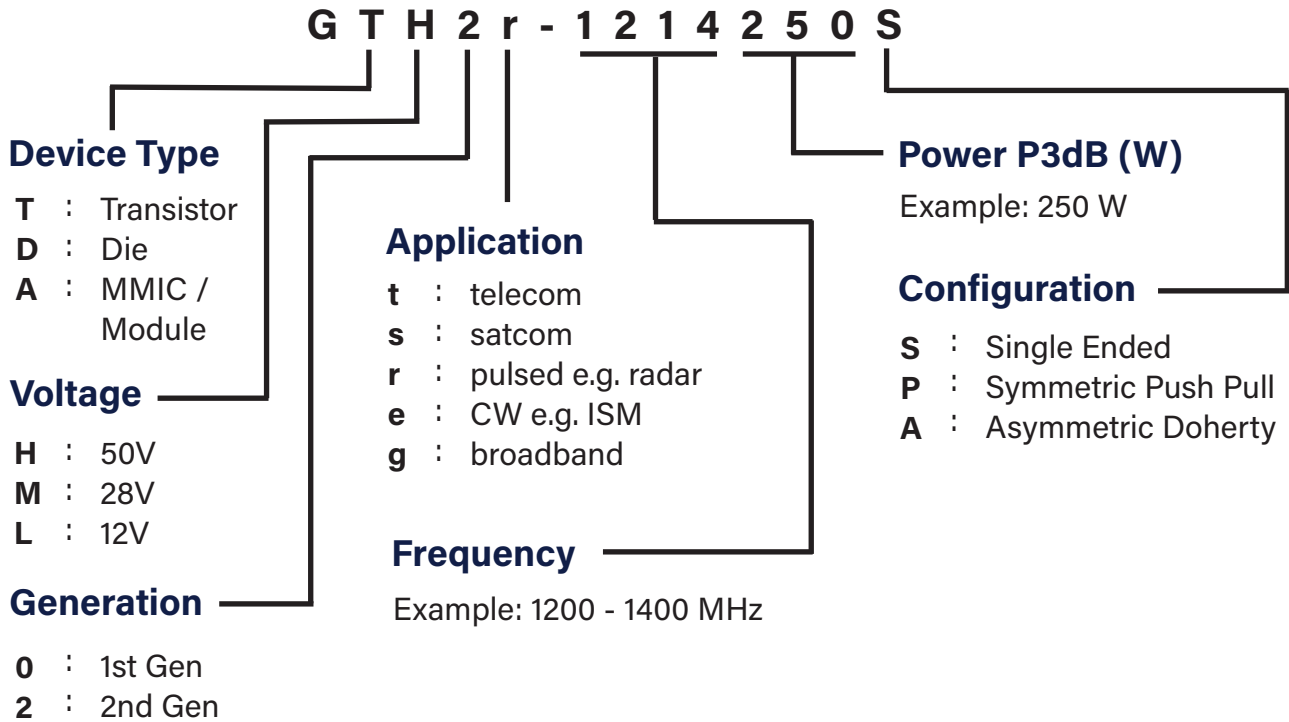


NI-360

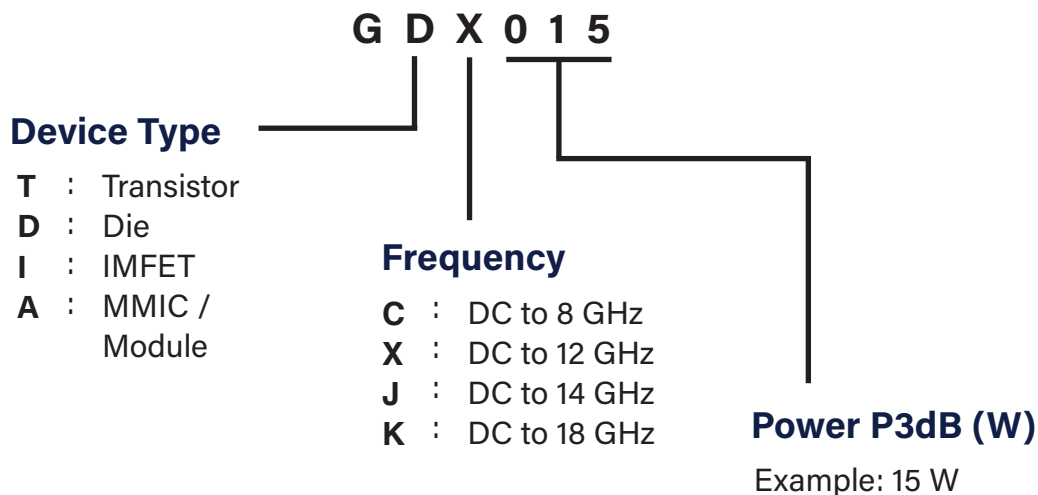


NI-650-4L

ACC/ACP Part # Naming Convention



Die Part # Naming Convention



Design Tools and Resources

We strive to enable our customers' success at every stage of their product lifecycle. Our dedicated application engineering team is always ready to support with a comprehensive range of resources from S-parameters, load-pull data, ADS/AWR models, samples to evaluation boards. We are committed to support our customers from product conceptualization to production.

Available tools and resources upon request:

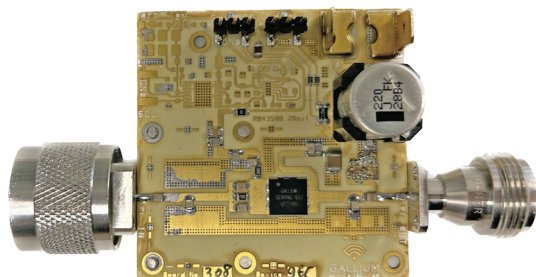
- Broadband S-parameter Data at different Drain Supply Voltage
- Broadband Loadpull Data
 - Data supplied at 50V and 28V Drain Supply Voltage
 - Broadband test frequencies
 - Optimum performance at max peak power and max peak efficiency tuning
- Electrical Models in Keysight Pathwave Advanced Design Software (ADS) and AWR Microwave Office (MWO)

Contact us at www.galliumsemi.com/contact or sales@galliumsemi.com.

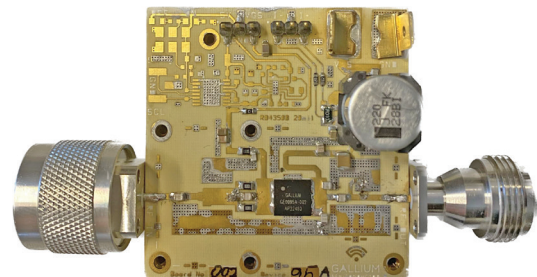
Reference Designs

Class AB Demo Amplifiers

Part Name	Psat (W)	Frequency (GHz)	Voltage (V)	Test Signal
GT010D-EVB-1	10	3.4-3.8	50	Pulse Width 100us, Duty Cycle 10%
GT010D-EVB-2	10	1.7-2.7	50	Pulse Width 100us, Duty Cycle 10%
GT010D-EVB-3	10	0.7-1.7	50	Pulse Width 100us, Duty Cycle 10%
GTH0-0080015S-EVB-1	15	3.1-3.5	50	CW
GTH0-0080015S-EVB-2	15	2.6-3.1	50	Pulse Width 100us, Duty Cycle 10%
GT020D-EVB-1	20	2.3-3.9	50	Pulse Width 100us, Duty Cycle 10%
GT020D-EVB-2	20	5.2-5.9	50	Pulse Width 100us, Duty Cycle 10%
GT030D-EVB-1	30	1.8-4.2	50	Pulse Width 100us, Duty Cycle 10%
GT030D-EVB-2	30	3.0-4.0	50	Pulse Width 100us, Duty Cycle 10%
GT030D-EVB-3	30	5.2-5.9	50	Pulse Width 100us, Duty Cycle 10%
GTH0-0070030S-EVB-1	30	2.4-3.1	50/28	Pulse Width 100us, Duty Cycle 10% & CW
GTH0-0060050S-EVB-1	50	2.9-3.1	50	Pulse Width 100us, Duty Cycle 10% & CW
GT065D-EVB-1	65	2.1-3.7	50	Pulse Width 100us, Duty Cycle 10%
GTH0-0037080S-EVB-1	80	2.9-3.1	50	Pulse Width 100us, Duty Cycle 10% & CW
GT090D-EVB-1	90	2.1-3.7	50	Pulse Width 100us, Duty Cycle 10%
GTH0-0037110S-EVB-1	110	2.9-3.1	50	Pulse Width 100us, Duty Cycle 10% & CW
GT135D-EVB-1	135	2.5-3.2	50	Pulse Width 100us, Duty Cycle 10%
GT135D-EVB-2	65	2.5-2.7	28	LTE 10MHz, 9.5dB PAPR
GTH0-0032150S-EVB-1	150	2.9-3.1	50	Pulse Width 100us, Duty Cycle 10% & CW
GTH2r-2731150S-EVB-1	150	2.7-3.1	50	Pulse Width 100us, Duty Cycle 10%
GTH2r-1014150S-EVB-1	150	1.2-1.4	50	Pulse Width 100us, Duty Cycle 10%
GTH2r-3135125S-EVB-1	125	3.1-3.5	50	Pulse Width 100us, Duty Cycle 10%
GTH2r-3135250S-EVB-1	250	3.1-3.5	50	Pulse Width 100us, Duty Cycle 10%
GTH2r-2731125S-EVB-1	125	2.7-3.1	50	Pulse Width 100us, Duty Cycle 10%
GTH2r-2731250S-EVB-1	250	2.7-3.1	50	Pulse Width 100us, Duty Cycle 10%
GTH0-0037110S-EVB-2	50	0.5-2.5	28	Pulse Width 100us, Duty Cycle 10% & CW
GTH2e-2425300P-EVB-1	50	2.4-2.5	50	Pulse Width 100us, Duty Cycle 10% & CW



GTH2r-1014150S-EVB-1



GTH2r-2731150S-EVB-1

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We are proud to announce our new partnerships with manufacturers of leading edge and disruptive technologies. These technologies drive the latest innovations for our customers.