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SEMICONDUCTOR

PRODUCT CATALOG 2023

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

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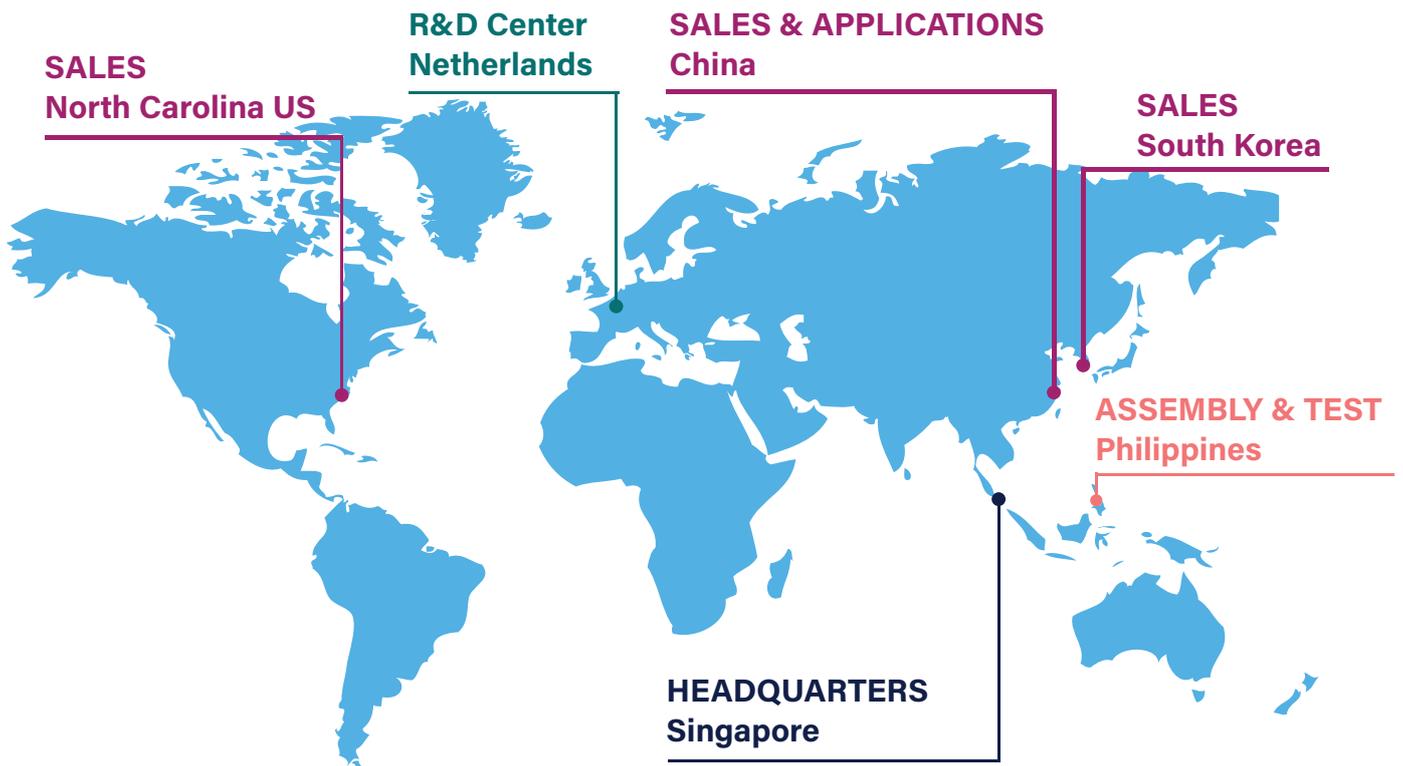


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RF GaN for High Performance Applications



Global Footprint with Local Presence

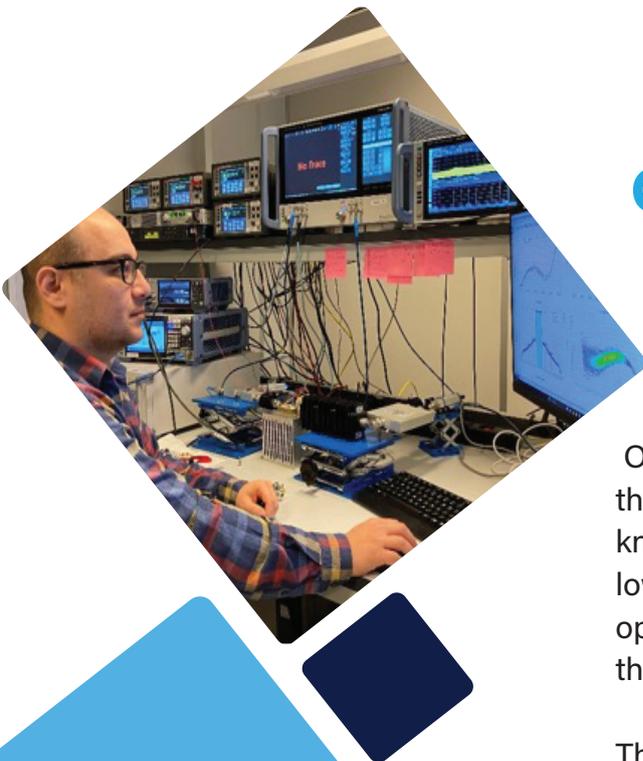


About Gallium Semiconductor

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, defense, 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.

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)	ECCN
GD010	DC-8.0	10	20	61	50	0.90 x 0.75	EAR99
GD020	DC-7.0	20	21	63	50	1.26 x 0.75	EAR99
GD030	DC-6.0	30	21	64	50	1.63 x 0.75	EAR99
GD060	DC-3.7	60	21	64	50	2.35 x 0.75	EAR99
GD080	DC-3.7	80	21	66	50	2.74 x 0.82	EAR99
GD090	DC-3.7	90	22	67	50	3.08 x 0.75	EAR99
GD135	DC-3.2	135	19	66	50	3.48 x 0.80	EAR99
GD160	DC-3.2	160	19	65	50	3.50 x 0.90	EAR99
GD200	DC-3.2	200	19	64	50	3.50 x 0.90	EAR99

28V GaN-on-SiC Bare Die upto Ku-Band ^[1]

Part Name	Frequency (GHz)	Psat (W)	Linear Gain (dB)	Efficiency (%)	Voltage (V)	Die Size (mm)	ECCN
GDC009	DC-7.0	8	22	65	28	0.785 x 1.05	EAR99
GDX007	DC-8.5	7	22	65	28	0.735 x 1.05	EAR99
GDX005	DC-11.0	5	22	65	28	0.655 x 1.05	EAR99
GDJ007	DC-14.0	7	22	65	28	0.595 x 1.05	EAR99
GDJ011	DC-18.0	10	22	65	28	0.61 x 2.18	EAR99
GDK002	DC-18.0	1.6	22	65	28	0.61 x 1.05	EAR99
GDK005	DC-18.0	5	22	65	28	0.61 x 2.18	EAR99
GDK009	DC-18.0	9	22	65	28	0.61 x 3.345	EAR99
GDK010	DC-18.0	11	22	65	28	0.61 x 3.93	EAR99
GDK003	DC-18.0	2.4	22	65	28	0.56 x 1.05	EAR99
GDX015	DC-12.0	15	22	65	28	3.34 x 0.64	EAR99

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	ECCN
GT010D	DC-8.0	10	21	63	50	DFN 3x6	EAR99
GT015D ^[1]	DC-12.0	15	21	66	28	DFN 3x6	EAR99
GT020D	DC-7.0	20	21	66	50	DFN 3x6	EAR99
GT030D	DC-6.0	30	21	66	50	DFN 3x6	EAR99
GT065D	DC-3.7	65	23	67	50	DFN 3x6	EAR99
GT090D	DC-3.7	90	23	68	50	DFN 3x6	EAR99
GT135D	DC-3.2	135	22	67	50	DFN 3x6	EAR99

Discrete Wideband GaN Amplifiers in ACC

Part Name	Frequency (GHz)	Psat (W)	Linear Gain (dB)	Efficiency (%)	Voltage (V)	Package	ECCN
GTH0-0080015S	DC-8.0	15	20	63	50	NI-200	EAR99
GTH0-0070030S	DC-7.0	30	19	68	50	NI-200	EAR99
GTH0-0060050S	DC-6.0	50	19	66	50	NI-360	EAR99
GTH0-0037110S	DC-3.7	110	21	65	50	NI-360	EAR99
GTH0-0032150S	DC-3.2	150	18	70	50	NI-360	EAR99
GTH0-0032180P	DC-3.2	180	18	66	50	NI-650	EAR99

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	ECCN
GTH2r-1214150S	1.2-1.4	150	18	75	50	DFN 6.5x7	EAR99
GTH2r-1214500P ^[1]	1.2-1.4	500	18	65	50	ACP-800	EAR99
GTH2r-0912500P ^[1]	0.96-1.215	500	18	65	50	ACP-800	EAR99
GTH2r-1010700P ^[1]	1.03-1.09	700	20	70	50	ACP-800	EAR99
GTH2r-2731125S	2.7-3.1	125	15	63	50	ACP-462	EAR99
GTH2r-3135125S	3.1-3.5	125	15	56	50	ACP-462	EAR99
GTH2r-2731150S	2.7-3.1	150	17	67	50	DFN 6.5x7	EAR99
GTH2r-2934150S ^[1]	2.9-3.4	150	16	65	50	DFN 6.5x7	EAR99
GTH2r-2731250S ^[1]	2.7-3.1	250	17	65	50	ACP-800	EAR99
GTH2r-3135250S ^[1]	3.1-3.5	250	16	65	50	ACP-800	EAR99
GTH2r-2731500P ^[1]	2.7-3.1	500	17	65	50	ACP-800	EAR99
GTH2r-3135500P ^[1]	3.1-3.5	500	16	65	50	ACP-800	EAR99

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

Part Name	Frequency (GHz)	Psat (W)	Linear Gain (dB)	Efficiency (%)	Voltage (V)	Package	ECCN
GAM2r-5060050S	5.0-6.0	50	15	55	40	LGA	EAR99
GAM2r-6010015S	6.0-10.0	15	13	45	40	LGA	EAR99
GAM2r-9199050S	9.1-9.9	50	15	55	40	LGA	EAR99
GAM2r-9199100S	9.1-9.9	100	25	55	40	LGA	EAR99

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	ECCN
GTH2e-0809500P	0.896-0.928	500	20	73	50	ACP-800	EAR99
GTH2e-1313500P	1.3	500	19	73	50	ACP-800	EAR99
GTH2e-2425300P	2.4-3.5	300	18	73	50	ACP-800	EAR99
GTH2e-2425500P	2.4-3.5	500	17	73	50	ACP-1600	EAR99

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	ECCN
GTH0-3338050A	3.3-3.8	50	7	15	52	50	DFN 6.5x7	EAR99
GTH0-2327050A	2.3-2.7	50	7	16	57	50	DFN 6.5x7	EAR99
GTH0-3742050A	3.7-4.2	50	7	14	50	50	DFN 6.5x7	EAR99
GTH0-3742100A	3.7-4.2	100	14	13.5	48	50	DFN 6.5x7	EAR99
GTH0-3338100A	3.3-3.8	100	14	14	51	50	DFN 6.5x7	EAR99
GTH0-2327100A	2.3-2.7	100	14	15	57	50	DFN 6.5x7	EAR99
GTH0-4450035A	4.4-5.0	35	5	13	44	50	DFN 6.5x7	EAR99
GTH0-4450070A	4.4-5.0	70	7	13	42	50	DFN 6.5x7	EAR99

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	ECCN
GTH0-2327400A	2.3-2.7	400	56	15	53	50	ACP-800	EAR99
GTH0-3338450A	3.3-3.8	450	56	13	45	50	ACP-800	EAR99
GTH0-3742450A	3.7-4.2	450	56	12	43	50	ACP-800	EAR99
GTH0-2327600A	2.3-2.7	600	85	14	49	50	ACP-800	EAR99
GTH0-3338650A	3.3-3.8	650	85	12.5	43	50	ACP-800	EAR99
GTH0-4450500A	4.4-5.0	500	56	11.5	40	50	ACP-800	EAR99

Single Ended GaN Driver in DFN for Macro Applications ^[1]

Part Name	Frequency (GHz)	Psat (W)	Pave (W)	Linear Gain (dB)	Efficiency (%)	Voltage (V)	Package	ECCN
GTH0-2327080S	2.3-2.7	80	2.4	18	12	50	DFN 6.5x7	EAR99
GTH0-3338080S	3.3-3.8	80	3	18	12	50	DFN 6.5x7	EAR99
GTH0-3742080S	3.7-4.2	80	3.2	17	10	50	DFN 6.5x7	EAR99
GTH0-4450080S	4.4-5.0	80	4.3	16	10	50	DFN 6.5x7	EAR99

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

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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

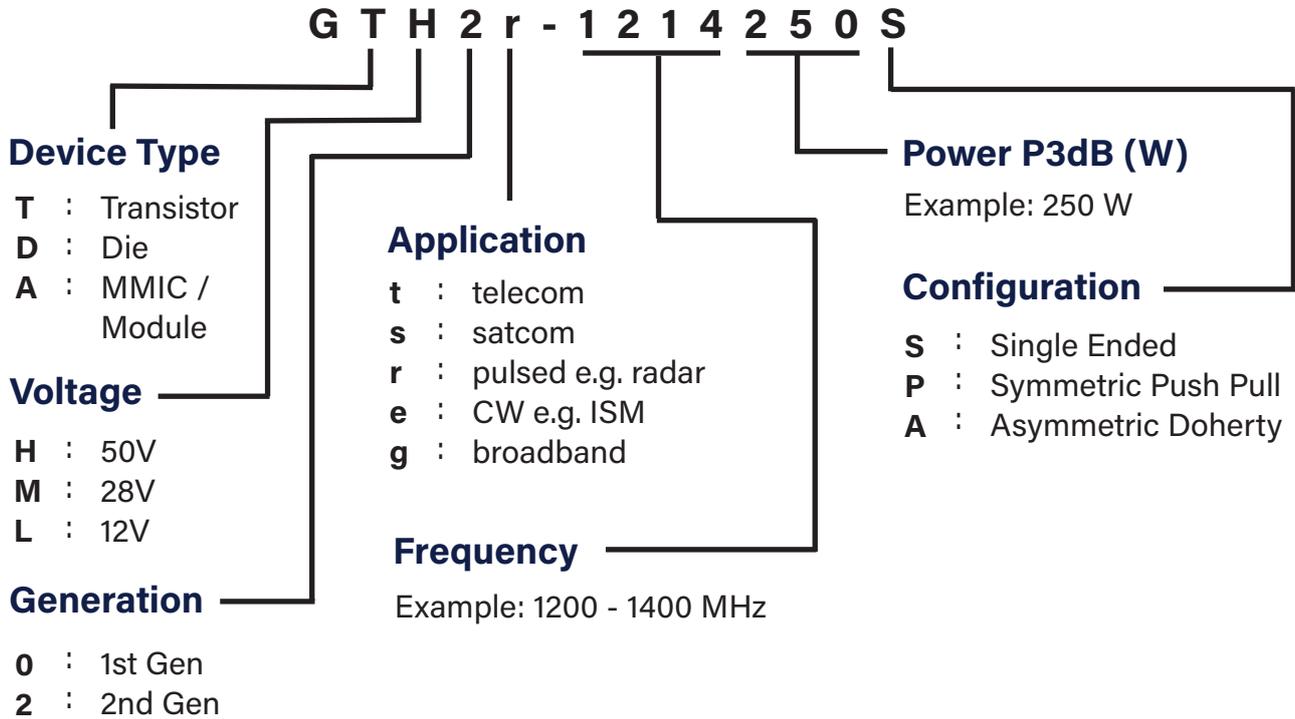


NI-360

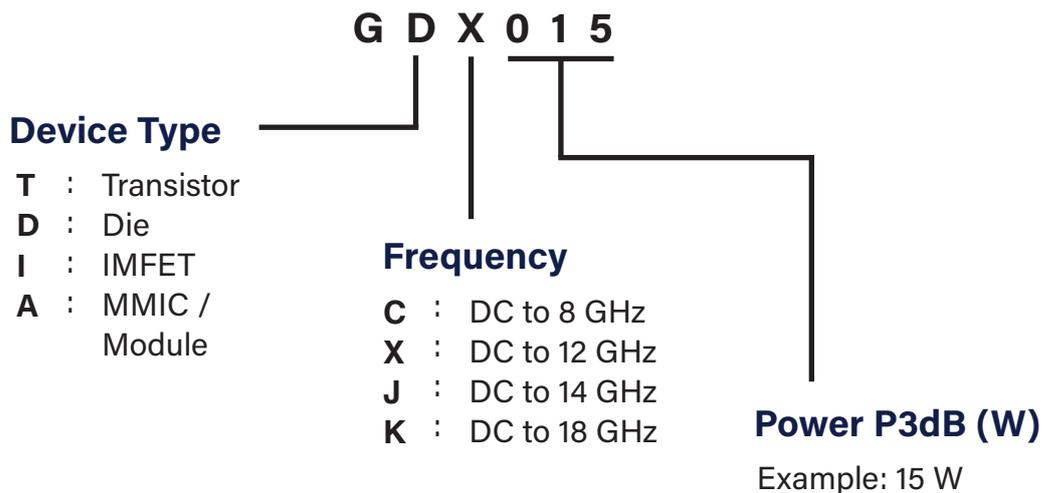


NI-650-4L

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%
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%
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-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.