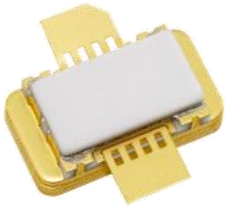
■ Features

- High Voltage Operation : VDS=50V
- High Power : 52.5dBm (typ.) @ Psat
- Proven Reliability



■ Description

Sumitomo Electric's GaN-HEMT offers high efficiency, ease of matching, greater consistency and broad bandwidth for high power L-band amplifiers with 50V operation, and gives you higher gain.

This new product is ideally suited for use from 2.3GHz to 2.7GHz W-CDMA and LTE design requirements as it offers high gain, long term reliability and ease of use.

ABSOLUTE MAXIMUM RATINGS (Case Temperature T_c=25deg.C)

Item	Symbol	Condition	Rating	Unit
Operating Voltage	V_{DS}		55	V
Drain-Source Voltage	V_{DS}	V_{GS}=-8V	160	V
Gate-Source Voltage	V_{GS}		-15	V
Total Power Dissipation	P_t		140.6	W
Storage Temperature	T_{stg}		-65 to +175	deg.C
Channel Temperature	T_{ch}		250	deg.C

RECOMMENDED OPERATING CONDITION

Item	Symbol	Condition	Limit	Unit
DC Input Voltage	V_{DS}		$\leq$ 55	V
Forward Gate Current	I_{GF}	R_G=5 ohm	$\leq$ 142	mA
Reverse Gate Current	I_{GR}	R_G=5 ohm	$\geq$ -5.2	mA
Channel Temperature	T_{ch}		$\leq$ 200	deg.C
Average Output Power	$P_{ave.}$		$\leq$ 49.5	dBm

ELECTRICAL CHARACTERISTICS (Case Temperature T_c=25deg.C)

Item	Symbol	Condition	Limit			Unit
			Min.	Typ.	Max.	
Pinch-Off Voltage	V_p	V_{DS}=50V I_{DS}=36mA	-4.0	-	-2.0	V
Saturated Power	Psat *1	V_{DS}=50V $I_{DS(DC)}$=0mA f=2.65GHz	51.5	52.5	-	dBm
Drain Efficiency at Psat	DE *1		53.0	60.0	-	%
Power Gain	Gp *2	V_{DS}=50V $I_{DS(DC)}$=600mA f=2.65GHz	15.5	16.5	-	dB
Thermal Resistance	R_{th}	Channel to Case at 78W P_{DC}	-	1.4	1.6	deg.C/W

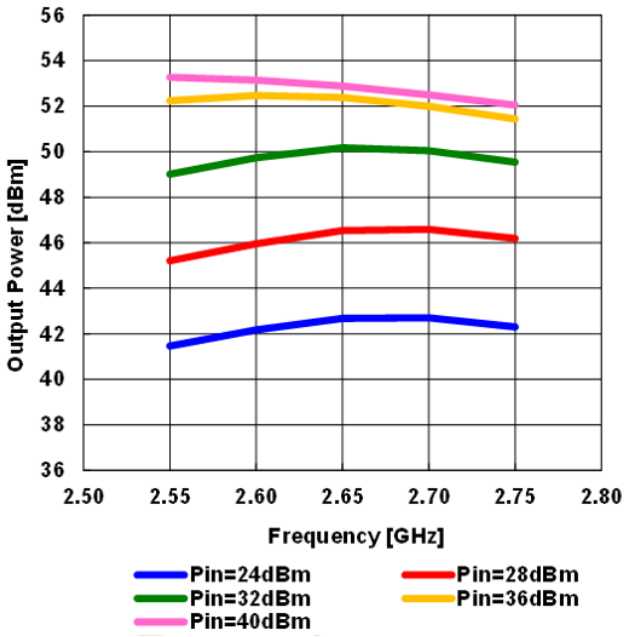
*1 : 10%-duty RF pulse (DC supply constant), Fixed Pin=39dBm

*2 : Pout=44.5dBm, CW modulation Signal (W-CDMA)

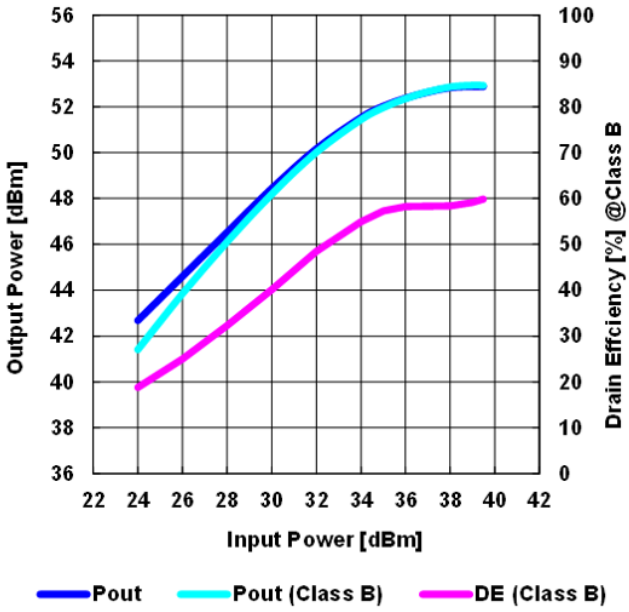
RoHS Compliance	YES

RF characteristics @f=2.65GHz fine tuned

Output Power vs. Frequency
V_{DS}=50V $I_{DS(DC)}$=900mA

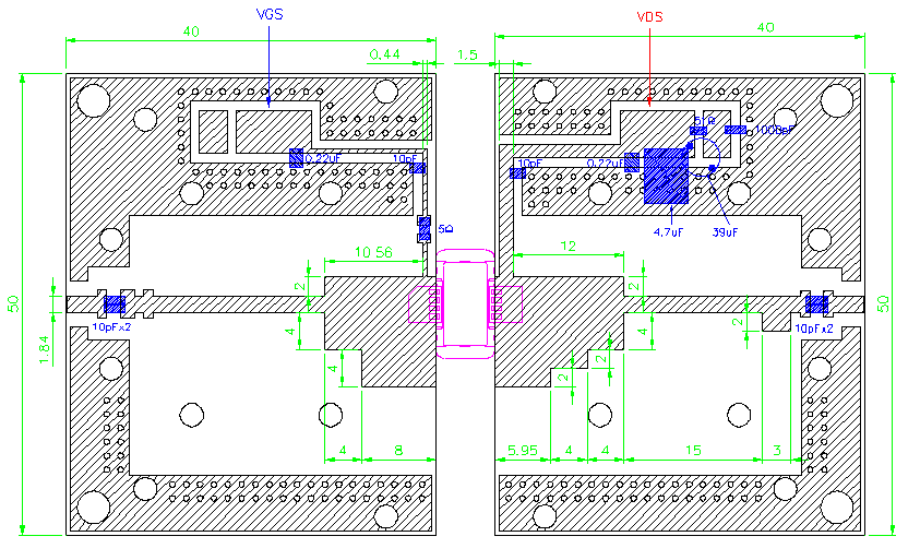


Output Power and Drain Efficiency vs. Input Power
V_{DS}=50V $I_{DS(DC)}$=900mA f=2.65GHz



Pulse Signal (10%-duty, DC : constant)

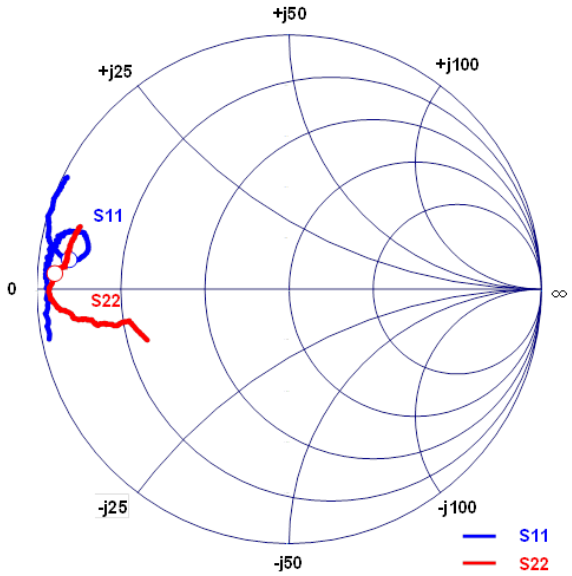
Test Fixture

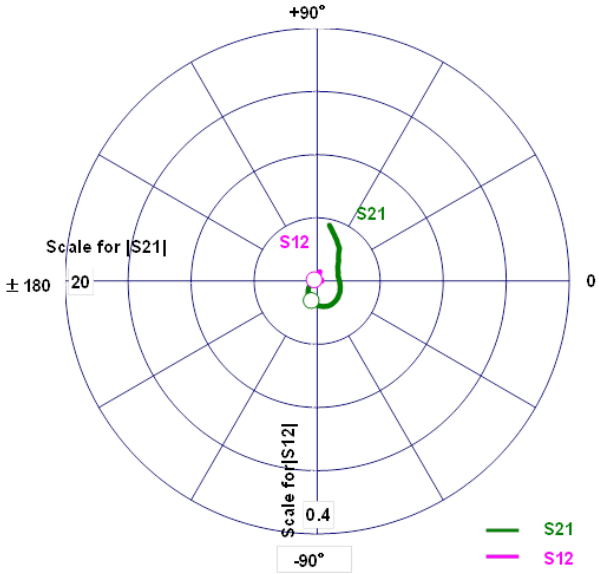


h=0.8mm εr=3.5
Cu=18um Unit: mm

- Reference DATA -

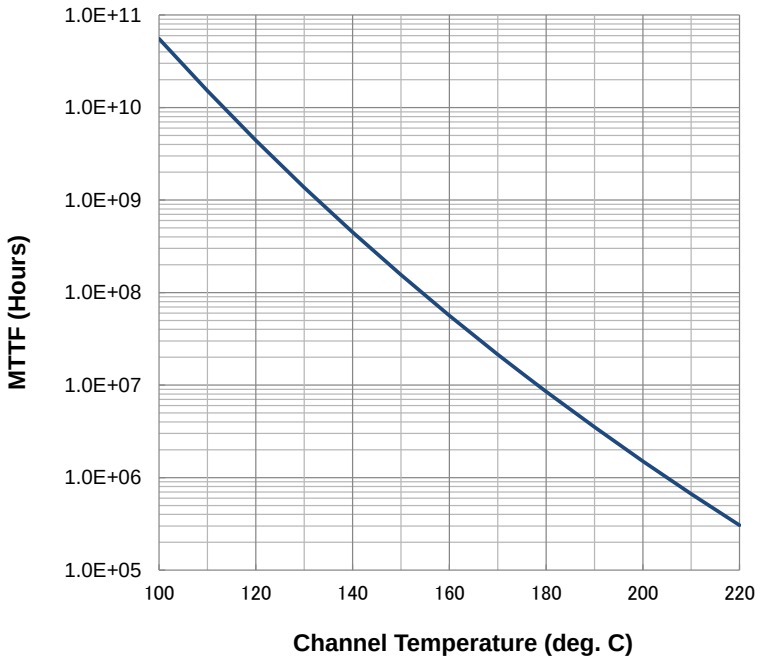
S-Parameters @VDS=50V, IDS(DC)=900mA, f=0.5 to 4.5GHz
Zl = Zs = 50ohm Marker : 2.65GHz





Freq.	S11		S21		S12		S22	
GHz	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
0.5	0.97	-168.33	4.53	77.54	0.005	6.65	0.60	-160.38
0.6	0.96	-175.67	3.72	66.82	0.005	3.61	0.62	-164.49
0.7	0.96	177.21	3.14	55.80	0.005	-1.98	0.65	-168.57
0.8	0.96	176.73	2.75	51.59	0.005	-5.54	0.66	-168.96
0.9	0.96	175.17	2.47	46.84	0.005	-0.58	0.68	-168.60
1.0	0.96	174.45	2.29	41.94	0.005	-4.86	0.70	-168.32
1.1	0.96	173.85	2.09	37.54	0.005	-8.19	0.72	-168.64
1.2	0.96	172.40	1.95	33.05	0.004	-3.86	0.73	-169.20
1.3	0.96	171.88	1.87	28.76	0.004	-5.48	0.75	-169.44
1.4	0.96	171.15	1.83	23.63	0.005	-4.06	0.77	-169.47
1.5	0.96	170.55	1.76	19.11	0.004	-7.45	0.78	-170.15
1.6	0.95	169.37	1.72	14.06	0.005	-5.52	0.79	-171.02
1.7	0.93	167.70	1.72	7.93	0.004	-10.23	0.81	-171.51
1.8	0.93	166.94	1.77	1.99	0.004	-17.41	0.83	-171.61
1.9	0.92	166.27	1.81	-5.39	0.004	-17.44	0.85	-172.07
2.0	0.90	165.69	1.88	-12.23	0.004	-29.05	0.87	-172.67
2.1	0.88	165.25	1.97	-22.78	0.004	-36.75	0.88	-174.08
2.2	0.85	164.71	2.06	-34.99	0.004	-61.66	0.91	-174.74
2.3	0.83	165.88	2.14	-48.52	0.004	-86.89	0.93	-176.69
2.4	0.81	168.49	2.16	-64.97	0.004	-123.00	0.95	-178.83
2.5	0.83	170.91	2.00	-82.72	0.004	-155.78	0.94	179.05
2.6	0.86	172.33	1.75	-99.89	0.005	172.61	0.93	176.88
2.7	0.90	172.17	1.48	-113.74	0.005	150.38	0.93	175.79
2.8	0.92	171.30	1.23	-124.98	0.006	133.81	0.91	174.70
2.9	0.95	170.26	1.02	-134.71	0.006	121.97	0.90	174.55
3.0	0.96	169.09	0.85	-141.85	0.006	113.19	0.89	174.16
3.1	0.98	167.82	0.71	-147.89	0.007	106.63	0.89	173.47
3.2	0.98	166.51	0.62	-154.06	0.007	102.93	0.89	173.01
3.3	0.98	165.46	0.54	-158.56	0.007	97.46	0.89	172.59
3.4	0.99	164.36	0.47	-163.02	0.008	94.08	0.89	172.33
3.5	1.00	163.48	0.42	-166.87	0.008	89.70	0.89	171.43
3.6	0.99	162.25	0.38	-170.13	0.009	88.09	0.89	170.58
3.7	0.99	161.43	0.34	-174.43	0.009	87.00	0.88	170.16
3.8	0.99	160.30	0.32	-177.76	0.009	83.46	0.88	169.37
3.9	1.00	159.24	0.29	178.56	0.010	83.23	0.88	168.59
4.0	0.99	158.21	0.27	174.81	0.010	83.32	0.88	167.62
4.1	0.99	157.52	0.26	171.47	0.011	81.50	0.88	167.05
4.2	0.99	156.49	0.24	167.38	0.012	80.72	0.88	166.40
4.3	0.99	155.17	0.23	163.29	0.013	76.60	0.87	165.30
4.4	0.99	154.27	0.22	159.25	0.014	75.14	0.87	164.43
4.5	0.98	153.35	0.22	155.30	0.015	73.17	0.86	163.42

MTTF Calculation
– Estimated MTTF –



Ea=1.6eV
Confidence Level=90%

Channel Temp (deg.C)	MTTF (Hours)
160	5.98×10^7
180	9.02×10^6
200	1.60×10^6

$AF=\exp[(-Ea/k)(1/T_{stress}-1/T_{use})$

$MTTF_{use}=MTTF_{stress}*AF$

Where;

AF: acceleration factor

Ea: activation energy (1.6 eV)

k: Boltzman's constant (8.62×10^{-5} eV/K)

T_{stress}: stress temperature (K)

T_{use}: use temperature (K)

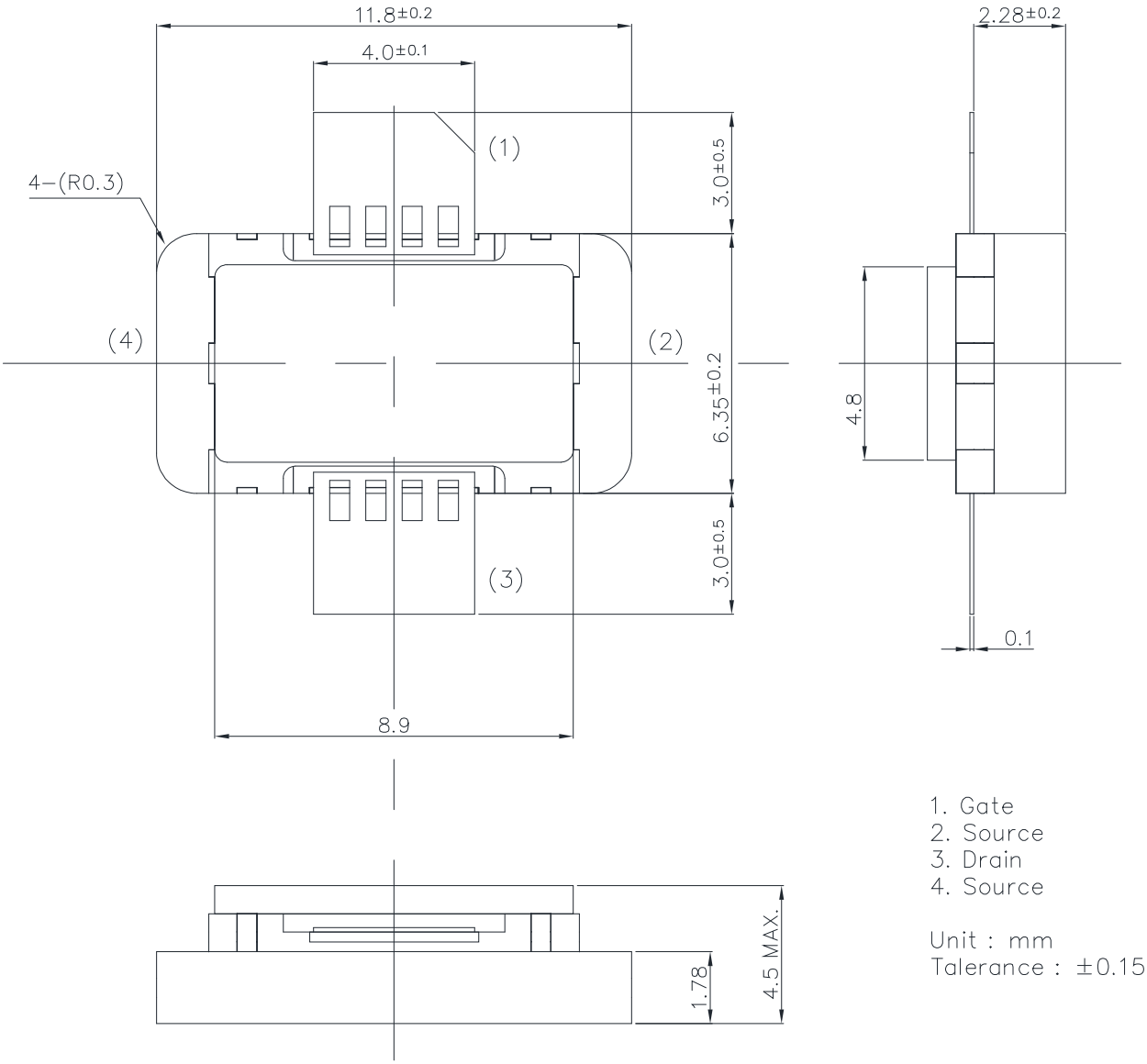
ESD characteristic

Test Methodology	Class
Human Body Model (per JESD22-A114)	1C
Machine Model (per JEIA/ESD22-A115)	B
Device Charged Model (per JESD22-C101)	IV

Ordering Information

Part Number	MOQ / MOU	Tray Style
SGN26H180M1H	No Limitation	30pcs Tray (30 pockets)
SGN26H180M1H/001	No Limitation	JEDEC Tray (100 pockets)

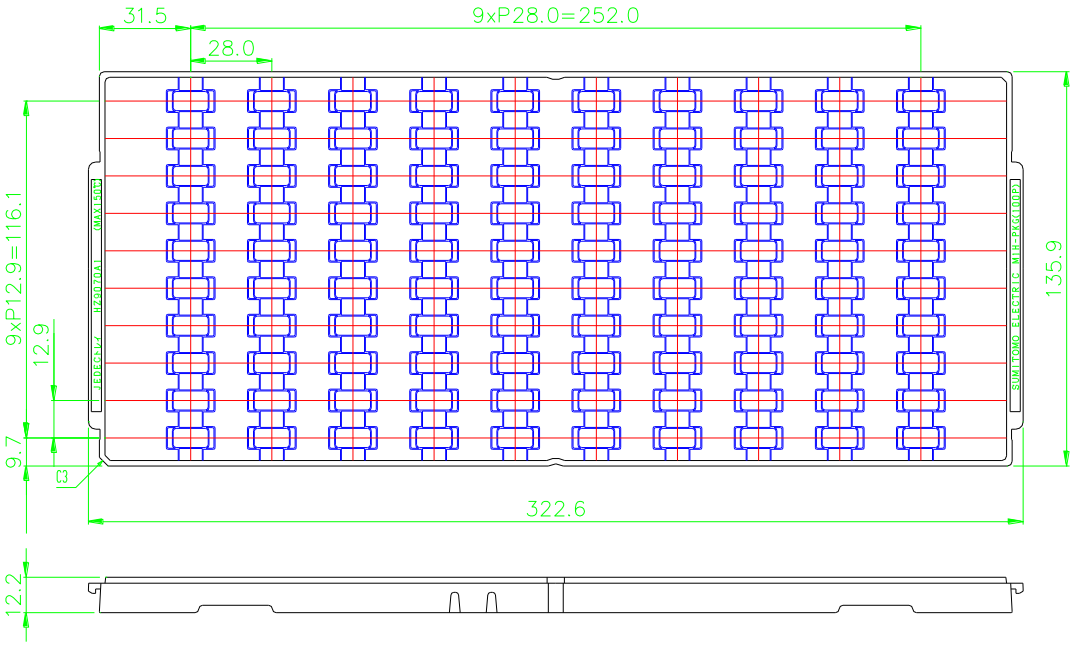
M1H Package Outline
Metal-Ceramic Hermetic Package



1. Gate
2. Source
3. Drain
4. Source

Unit : mm
Talerance : ±0.15

TRAY SIZE : M1H



For Safety, Observe the Following Procedures Environmental Management

- Do not put this product into the mouth.
- Do not alter the form of this product into a gas, powder, or liquid through burning, crushing, or chemical processing as these by-products are dangerous to the human body if inhaled, ingested, or swallowed.
- Respect all applicable laws of the country when discarding this product.
  This product must be disposed in accordance with methods specified by applicable hazardous waste procedures.

Any information, such as descriptions of a function and examples of application circuits, in this document are presented solely as a reference for the purpose to show examples of operations and uses of Sumitomo Electric semiconductor device(s); Sumitomo Electric does not warrant the proper operation of the device(s) with respect to its use based on such information. When the user develops equipment incorporating the device(s) based on such information, they must assume full responsibility arising out of using such information. Sumitomo Electric assumes no liability for any damages whatsoever arising out of the use of the information.

Any information in this document, including descriptions of function and schematic diagrams, shall not be construed as a license for the use or exercise of any intellectual property right, such as patent right or copyright, or any other right of Sumitomo Electric or any third party nor does Sumitomo Electric warrant non-infringement of any third-party's intellectual property right or other right by using such information. Sumitomo Electric assumes no liability for any infringement of the intellectual property rights or other rights of third parties which would result from the use of information contained herein.

The products described in this document are designed, developed and manufactured as contemplated for general use, including, without limitation, ordinary industrial use, general office use, personal use, and household use, but are not designed, developed and manufactured as contemplated (1) for use accompanying fatal risks or dangers that, unless extremely high safety is secured, could have a serious effect to the public, and could lead directly to death, personal injury, severe physical damage or other loss (i.e., nuclear reaction control in nuclear facility, aircraft flight control, air traffic control, mass transport control, medical life support system, missile launch control in weapon system), or (2) for use requiring extremely high reliability (i.e., submersible repeater and artificial satellite).
Please note that Sumitomo Electric will not be liable to the user and/or any third party for any claims or damages arising from the aforementioned uses of the products.

Any semiconductor devices have an inherent chance of failure. You must protect against injury, damage or loss from such failures by incorporating safety design measures into your facility and equipment such as redundancy, fire protection, and prevention of excessive current levels and other abnormal operating conditions.

If any products described in this document represent goods or technologies subject to certain restrictions on export under the Foreign Exchange and Foreign Trade Law of Japan, the prior authorization of the Japanese government will be required for export of those products from Japan.

http://www.sedi.co.jp/

ATTENTION
Information in this document is subject to change without notice.