GEC-Marconi

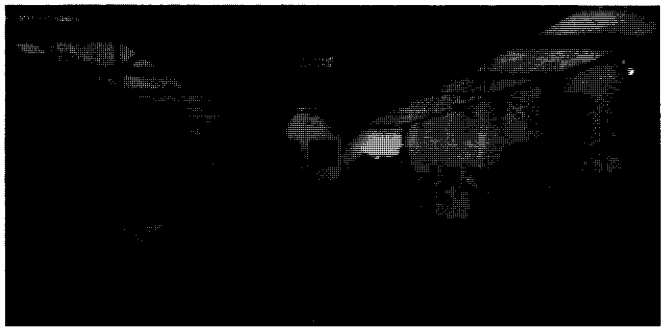
GEC-Marconi Materials Technology Ltd., was formally established in April 1991, and combines the previously separate businesses of Plessey Research Caswell Ltd. and Plessey Microwave Materials Ltd., subsequent to the acquisition of Plessey by GEC in September 1989. Its primary objective is to supply GEC systems businesses with advanced components and technologies and to exploit these in the external merchant market. The GaAs business (previously Plessey Three-Five Group Ltd.) has operated a commercial GaAs Foundry since 1985 and supported an extensive range of state-of-the-art standard components. We are ranked amongst the best GaAs facilities in the world today and are Europe's premiere operation.

The complete range of technologies encompassed by this newly formed business covers Microwave Materials, Sensors, Optoelectronics and GaAs.

The Materials Division is engaged in the design, development and manufacture of radar absorbent and transparent products. It is a recognised world leader in its field and has manufacturing facilities at Towcester (UK) and San Diego (USA).

The Optoelectronics Division provides advanced product manufacturing and R & D facilities covering telecoms, datacomms and optical sensor applications in both commercial and military fields. Typical products include LED's and lasers at 1300nm and 1550nm, specialist high speed lasers, modulators and detectors, and a range of specialist sensor LED'S.

The main activity of the Sensors Department is to investigate and develop new materials and devices for a variety of novel and existing applications using extensive on-site facilities. Established devices are derived from rugged, low power pyroelectric detectors which operate at room temperature. Off-the-shelf devices include intruder detectors, flame detectors, gas analysers, pollution monitors and surveillance systems. In addition, a range of thermal imaging systems are available incorporating up to 128 element linear and, for enhanced spatial resolution, 10,000 element 2D pyroelectric arrays.

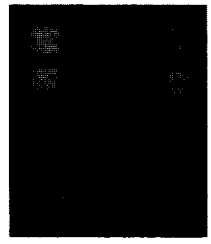


3-5

The GaAs Division now combines its existing facilities at Caswell with those previously operated by Plessey Three-Five Group at Towcester and the GEC-Marconi facilities at the Hirst Research Centre in London. The combined activity is now the sole UK GaAs operation and is currently being up-graded to a 3 inch wafer diameter production facility in a purpose designed building.

Although a newly formed Company, GEC-Marconi Materials Technology Ltd., can boast a long and successful track record in the field of GaAs technology. In 1970 work at Caswell resulted in the world's first commercial GaAs FET. 1976 saw another world first as researchers at Caswell published the world's first results on a GaAs FET based MMIC. Since then this work has been followed by the introduction of a commercial, high-yield, Foundry Service operating to 20GHz and the demonstration of increasingly complex multifunction MMICS, one example of which is the world's first combined gain and phase control chip for S-Band Phased Array Radar.

There are 102 direct staff employed in the GaAs Division at Caswell of which some 30 are involved in production. The remaining staff are engaged in technology and circuit research and development. The turnover in GaAs alone will be over £7 million in 1991. The major areas of current work in GaAs technology development are focussed on heterostructure devices, and, in particular pseudomorphic HEMT's and HJBT'S. Other programmes are concentrating on power-MMIC structures capable of several watts output power from locally heatsunk integrated circuit devices, and the millimetre- wave (F40) process. In the area of circuit research, work is directed towards higher levels of integation, high packing density circuits and advanced CAD techniques.



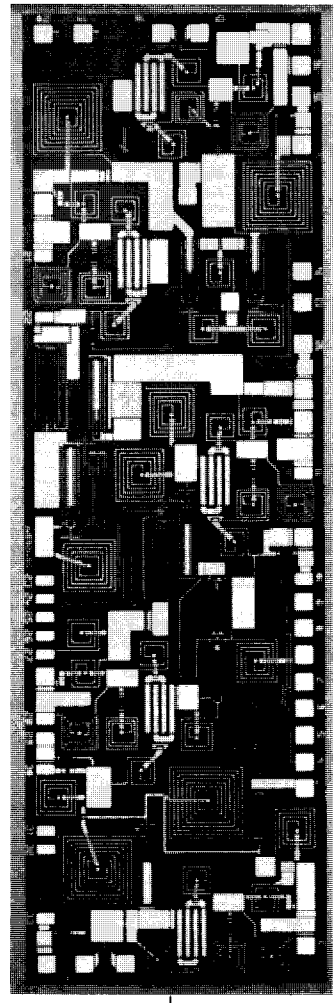
Circuit layouts utilising high packing density techniques are made possible by the collaborative work done between GEC-Marconi and Prof. Rolf Jansen. This work has led to the development of LINMIC+ a full field electromagnetic 3-D simulator. LINMIC+ is able to analyse the proximity coupling between microstrip transmission lines on a multi-dielectric substrate. This allows designers to compress their circuit designs while still being able to simulate the circuit with confidence. The design expertise available within the R & D Department is made available to external customers through a custom design service.

The GaAs Foundry Production Process is available as a product. The Foundry process offers the user the choice of two gate lengths. For applications up to 14GHz there is the 0.7 micron F14 process. For higher performance applications there is the 0.5 micron F20 process, with through GaAs via holes operating to 20GHz. Both processes can be selectively

implanted to combine different optimised device profiles on a single chip (e.g. gain/low noise and switch). A brochure outlining the key features of the Foundry process is available.

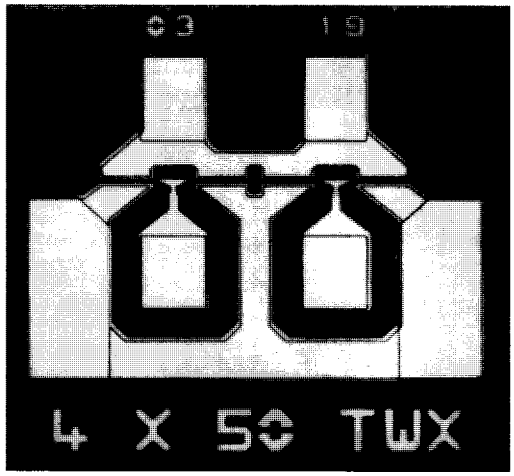
Currently over 20 companies are active users of the Foundry service. In addition the GEC-Marconi Foundry was chosen by Eurochip as the sole GaAs Foundry for University use in Europe. European universities can gain access to GaAs technology through the use of multi-project mask sets coordinated through the Eurochip organisation. Other university consortia have been established in Spain and in the UK.

External designs fabricated on the Foundry have included a DC-18GHz SPDT and SPST switch, a 14GHz low noise amplifier with 33dB gain and noise figure of 3.8dB, a range of components in the frequency band 1.8 - 2.4GHz (amplifiers, switches, phase shifters, attenuators), a 6 - 18GHz amplifier with 11dB gain, a variety of mixer topologies and a series of VCO's.



In addition to fabricating external designs the Foundry is used to fabricate a range of standard products. These standard products are available in either die or packaged form. The product portfolio currently includes four discrete FETS, ten MMIC amplifiers, over twenty MMIC switches and three MMIC attenuators. A summary of the products currently available can be provided upon request.

A major new product area for GEC-Marconi Materials Technology is in high performance discrete microwave transistors (pseudomorphic HEMTS) aimed at supporting the successful GEC-Marconi business in low noise downconvertors for direct broadcast by satellite receivers. Devices are currently being sampled to potential users with planned product launch in Summer 1991. Performance is equal to that available from Japanese suppliers today at typically 0.9dB NF and 10dB gain at 12 GHz. However, in research, devices with noise figures below 0.6dB have already been demonstrated in preparation for advanced products later this year.



Having established a discrete HEMT technology, programmes are already in place to extend this to a full integrated circuit process capable of enhanced performance at low frequency and performance through to 40GHz.

GEC-Marconi Materials Technology are also heavily involved in space applications in support of the Marconi-Matra Space Systems business, and have a current contract jointly supported by the European Space Agency, Alcatel- Espace and the British National Space Corporation to undertake space qualification of the Foundry processes. The programme is scheduled to complete with full capability approval in December 1992.

Finally, GEC-Marconi Materials Technology Ltd. is a high quality supplier of GaAs FETs and MMICs. As such Quality Assurance, Quality Control and Reliability play a major role in our business. Information pertaining to the quality and reliability of the Foundry process can be made upon request.

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GEC-Marconi Materials Technology Limited
GaAs Product Summary

MMIC Switches

Type	Configuration	Max Frequency (GHz)	Typical Loss (dB)	Typical Isolation (dB)	Package Style	Comments
P35-4205	SPDT-R	1	1.0	28	Chip, SO8	Low Cost
P35-4210	SPDT-R	1	0.6	28	Chip, TO5, FP	
P35-4211	SPDT-R	1	0.5	27	Chip, SO8	0.27mm Square
P35-4215	SPDT-RT	1	0.4	40	Chip, FP	On Chip Term
P35-4220	SPDT-RT	6	1.7	35	Chip	Term/Refl
P35-4221	SPDT-T	4	1.7	29	LCC	CMOS Driver
P35-4222	SPDT-T	3	1.2	35	LCC	
P35-4223	SPDT-T	3	1.1	40	TO5	CMOS/TTL
P35-4224	DPDT-T	2	1.2	43	FP	CMOS/TTL
P35-4225	SPDT-T	2	2.0	70	FP	Term/Refl
P35-4226	SPDT-RT	6	1.7	35	Chip	
P35-4230	SPST-R	12	2.2	23	Chip	
P35-4240	Switch Array	3	2.5	17	Chip	
P35-4241	Switch Array	3	3.0	17	Chip	
P35-4245	DPDT-R	6	0.8	32	Chip	
P35-4250	SP4T-R	4	1.1	28	Chip	0.67mm Squared
P35-4251	SP4T-T	2	1.9	48	FP	CMOS/TTL
P35-4252	SP4T-T	1	0.6	33	Chip	
P35-4253	SP3T-T	2	2.9	65	FP	CMOS/TTL
P35-4254	SP4T-T	2	2.9	65	FP	CMOS/TTL
P35-4260	SPDT-R	4	1.4	25	Chip, FP	
P35-4270	SPST-R	4	1.1	20	Chip, FP	

MMIC Attenuators

Type	Description	Frequency Range (GHz)	Typical Loss (dB)	Typical Range (dB)	Package Style	Comment
P35-4300	Linear	DC - 6GHZ	2	13	Chip, FP	Low VSWRs
P35-4301	Linear	DC - 6GHz	4	25	FP	Low VSWRs
P35-4302	Linear	DC - 6GHz	7	50	FP	Low VSWRs

FETs & HEMTs

Type	Frequency (GHz)	Typical Gain (dB)	Typical Noise Figure (dB)	Typical Power (dBm)	Package Style	Comments
P35-1101	1	15	1.0	7	Chip, TO18, P107	
P35-1105	12	8	3.3	13	Chip, P107, Micro-X	
P35-1110	-	45 ms Transconductance	0.5 nA Leakage Current	-	Chip, Micro-X, HP70	Designed for use in Opto PINFET Receivers
P35-1310	12	13	3.6	10	Chip, P110	Dual Gate FET
P35-1501	12	10	0.9	4	Chip, Micro-X	HEMT

MMIC Amplifiers

Type	Frequency Range (GHz)	Typical Gain (dB)	Typical Noise Figure	Typical Power (dBm)	Package Style	Comments
P35-4100	0.05 - 3.5	10	6.0	22	Chip, FP	
P35-4101	0.5 - 3.5	9	4.5	22	Chip, FP	Self Biased
P35-4104	0.05 - 3.0	18	6.0	13	Chip, FP	Low VSWRs
P35-4105	0.8 - 1.8	1	3.5	8	Chip	
P35-4110	1 - 6	7.5	4.6	20	Chip	
P35-4120	2.5 - 3.5	17	2.4	15	Chip	Low VSWRs
P35-4130	2 - 12	6.5	5.0	17	Chip	AGC
P35-4140	6 - 18	5.5	5.5	15	Chip	AGC
P35-4150	2 - 18	6.0	7.5	15	Chip	AGC
P35-4160	3 - 6	20	2.8	14	Chip	Low VSWRs

Notes:
1. New products are shown in bold text
2. R denotes reflective switch output
3. T denotes reflective switch output

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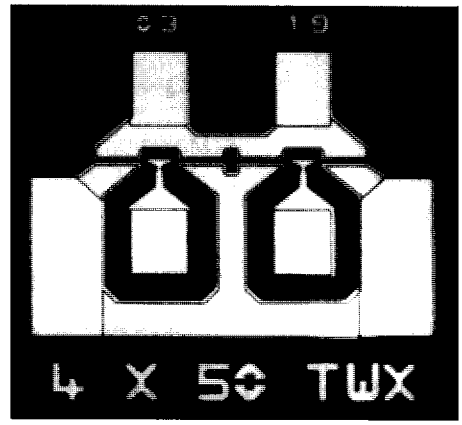
GaAs ULTRA LOW NOISE HEMT
P35-1501



The first of a new generation of high performance MBE HEMTs ideally suited for X-band LNBs in DBS receivers

Features:

- Low noise figure, 0.9dB typical at 12GHz
- High associated gain, 10db typical at 12GHz
- MBE heterostructure material
- E-beam 0.25 micron gate
- Silicon nitride passivated
- Available in chip form or Micro X package

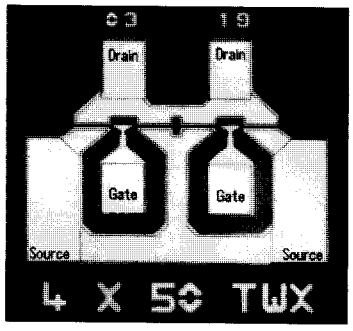
DC Electrical Characteristics (at 25 ℃)

Symbol	Parameter and Conditions	Units	Min	Max
Idss	Drain current at Vds=2V Idss<1mA	mA	10	50
Vp	Pinchoff Voltage at Vds=2V	V	0.5	2.0
Gm	Transconductance at Vds=2V Idss=10mA	mS	35	-

P35-1501-0 *Electrical Specification (at 25 ℃)*

Symbol	Parameters and Conditions	Units	Min	Typ	Max
Ft	Vds=2V, Ids=10mA	GHz	-	54	-
MAG	Maximum available gain at Vds=2V, Ids=10mA, F=12GHz	dB	-	12	-
NFopt	Optimum noise figure at Vds=2V, Ids=10mA, F=12GHz	dB	-	0.9	1.1
GNFopt	Associated gain when matched for NFopt at 12GHz	dB	9	10	-
Pout	Output power at 1dB compression point at 12GHz Vds=2V, Ids=10mA	dBm	-	9	-

P35-1501-0 Bond Pad Configuration

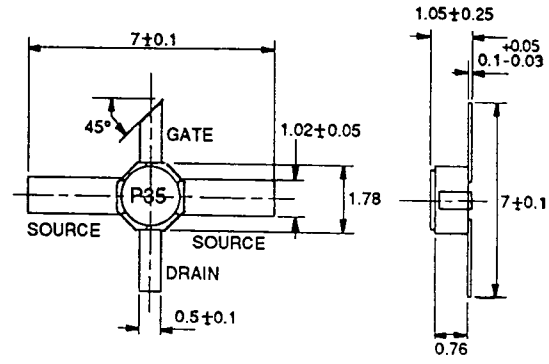


Gate Pad 44 x 65

Source Pad 70 x 162

Drain Pad 50 x 60

P35-1501-1 Package Outline



Nominal dimensions in mm

GEC-Marconi

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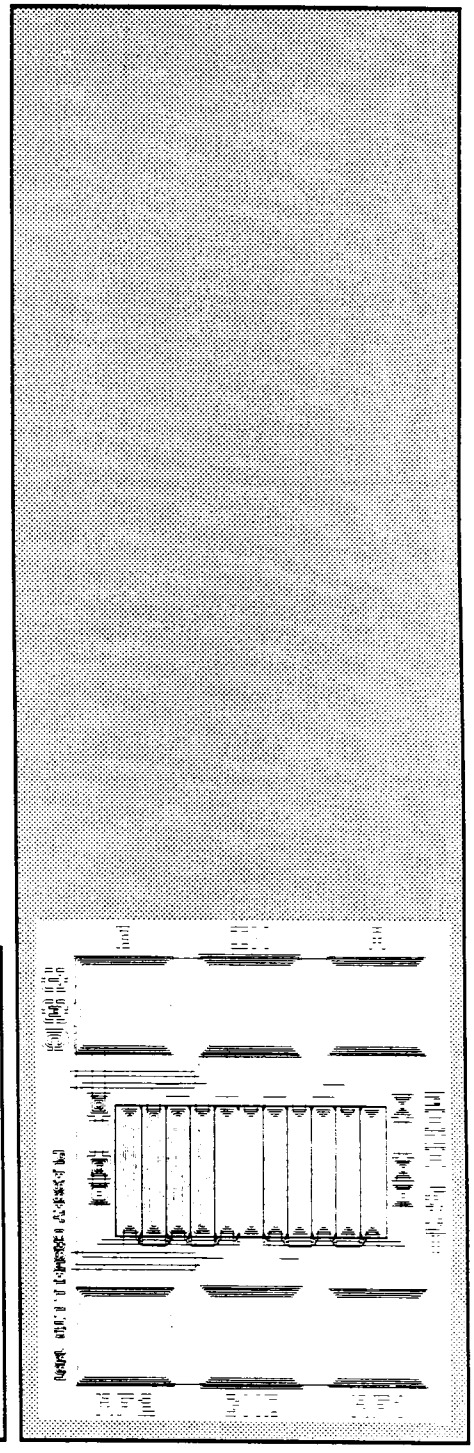
Advanced Product Information

GaAs MMIC SWITCH
P35-4211

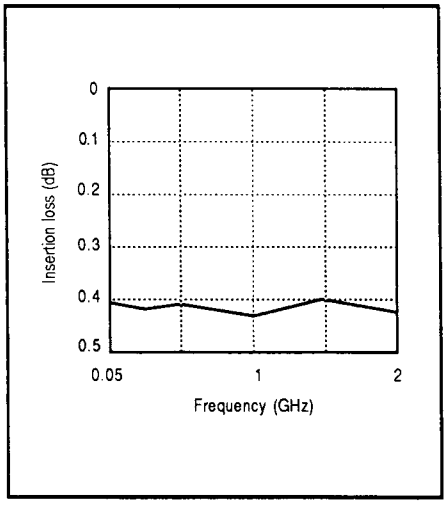
DC to 2GHz Low Cost Reflective SPDT

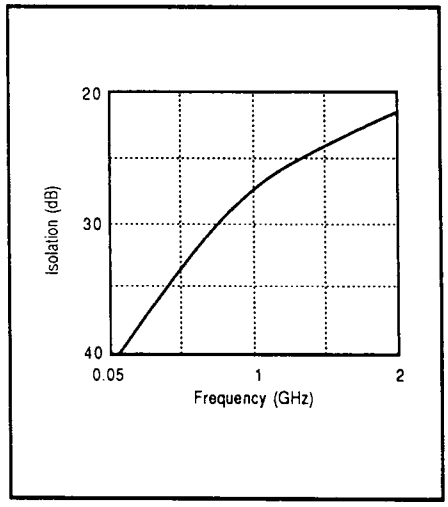


Features

- Low cost
- Ultra low DC power consumption
- Fast switching speed, 3ns typical
- Small chip, 0.27 mm^2
- Available in chip form or surface mount plastic package

Typical Performance





P35- 4211-0
RF Specification (+20°C)

Parameter	Conditions	Min	Typ	Max	Unit
Insertion loss	DC to 1GHz DC to 2GHz			0.5 0.6	dB
Isolation	DC to 1GHz DC to 2GHz	26 20			dB
Return Loss (Input/Output) See Note 1	DC to 1GHz DC to 2GHz		20 19		dB
P1dB See Notes 2 & 3	0.1 to 2GHz 50 MHz		30 23		dBm
Switching Speed	50% control to 10/90% RF		3		ns

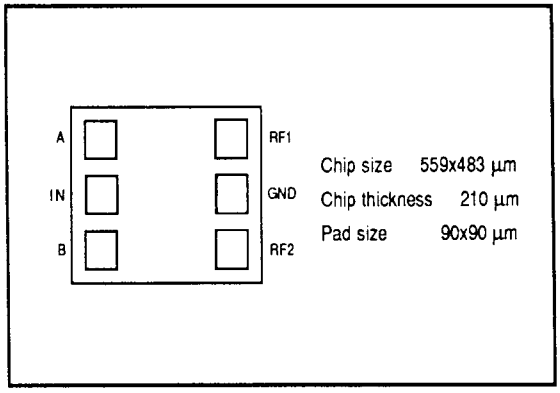
Notes:

1. Low Loss State.
2. Input power at which insertion loss compresses by 1dB.
3. Control Voltage: 0/-5V complimentary.
4. It is recommended that the chip is mounted with epoxy. Bond to all pads using 25µm diameter pure gold wire, thermally compression bonded.

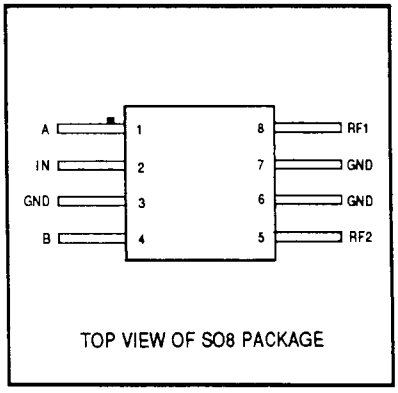
Switching Table

A	B	IN-RF1	IN-RF2
0V	-5V	LOW LOSS	ISOLATED
-5V	0V	ISOLATED	LOW LOSS

P35- 4211-0 Bond Pad Configuration

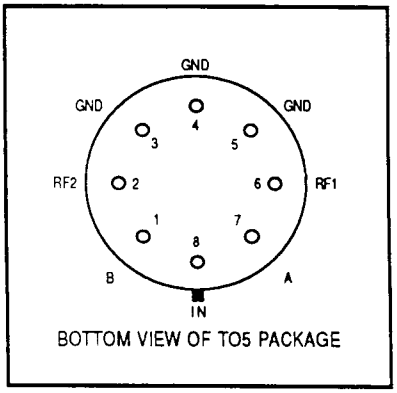


P35-4211-1 Pinout



TOP VIEW OF SO8 PACKAGE

P35-4211-2 Pinout



BOTTOM VIEW OF TO5 PACKAGE

Ordering Information

P35-4211-0 Chip, P35-4211-1 Plastic SO8 Package, P35-4211-2 T05 Package. Other Packages and Pinouts available.

GEC-Marconi

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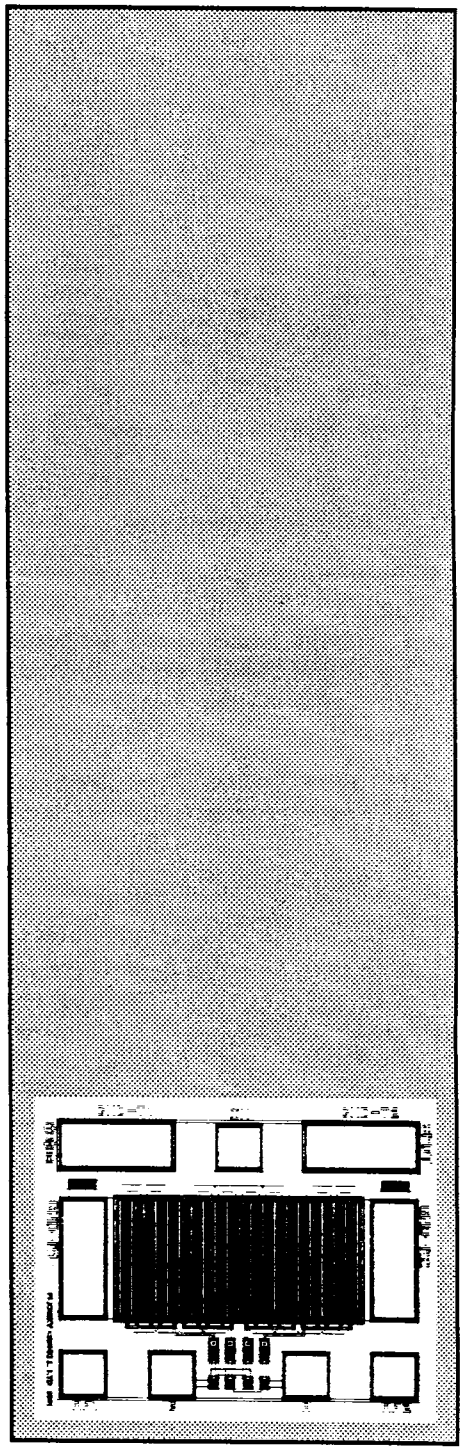
Advanced Product Information

GaAs MMIC SWITCH
P35-4215

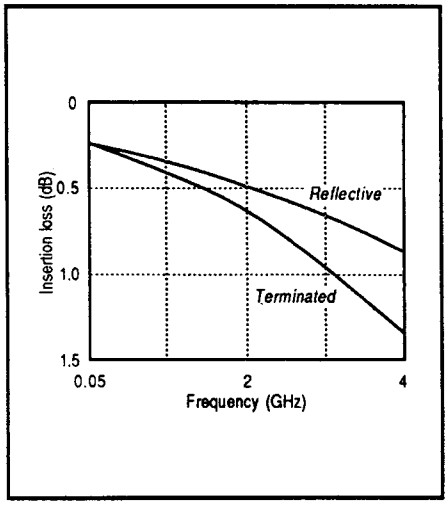
DC to 4GHz SPDT Reflective/Non-Reflective

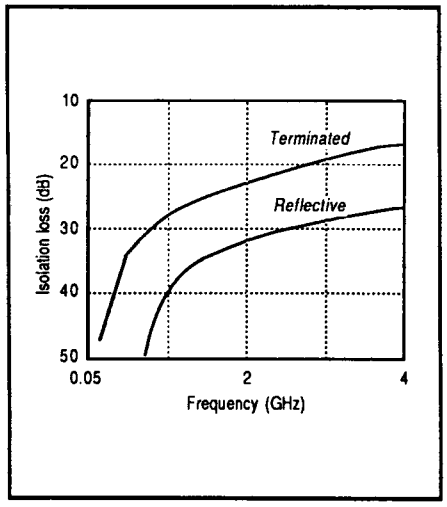


Features

- Broadband performance
- Low insertion loss
- Ultra low DC power consumption
- On-chip terminating resistors
- Fast switching speed, 3ns typical
- Available in chip form or surface mount package

Typical Performance





P35- 4215

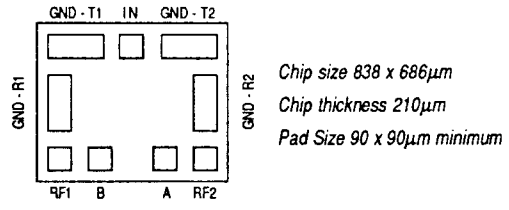
RF Specification (+20°C)

Parameter	Conditions	*Reflective (Note 1)*			*Terminated (Note 2)*			Unit
		Min	Typ	Max	Min	Typ	Max	
Insertion loss	DC to 1GHz		0.4	0.5		0.4	0.5	
	DC to 2GHz		0.5	0.6		0.6	0.7	dB
	DC to 4GHz		0.9	1.0		1.4	1.5	
Isolation	DC to 1GHz	38	40		26	28		
	DC to 2GHz	32	34		21	23		dB
	DC to 4GHz	26	28		16	17		
Return Loss	DC to 1GHz	20			20			
(Input/Output)	DC to 2GHz	15			15			dB
See Note 3	DC to 4GHz	10			10			
P1dB								
See Notes 4 & 5	0.1 to 4GHz		27			27		
	50 MHz		21			21		dBm
Switching Speed	50% control to 10/90% RF		3			3		ns

Notes:

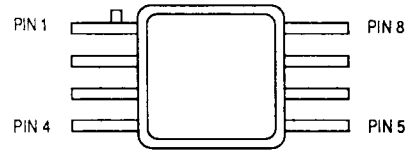
1. GND-R Pads Grounded.
2. GND-T Pads Grounded.
3. Low Loss State.
4. Input power at which insertion loss compresses by 1dB.
5. Control Voltage: 0/-5V complimentary.
6. It is recommended that the chip is mounted with epoxy. Bond to all pads using 25µm diameter pure gold wire, thermally compression bond

P35- 4215-0 Bond Pad Configuration



Chip size 838 x 686µm
Chip thickness 210µm
Pad Size 90 x 90µm minimum

P35- 4215-1 Pin Configuration



PIN	FUNCTION
1	Ground
2	RFin
3	Ground
4	Ground
5	RF1
6	B
7	A
8	RF2

SWITCHING TRUTH TABLE			
A	B	IN - RF1	IN - RF2
0V	-5V	LOW LOSS	ISOLATED
-5V	0V	ISOLATED	LOW LOSS

Ordering Information

P35-4215-0 Chip
P35-4215-1 Packaged
Other Pinouts and Packages Available

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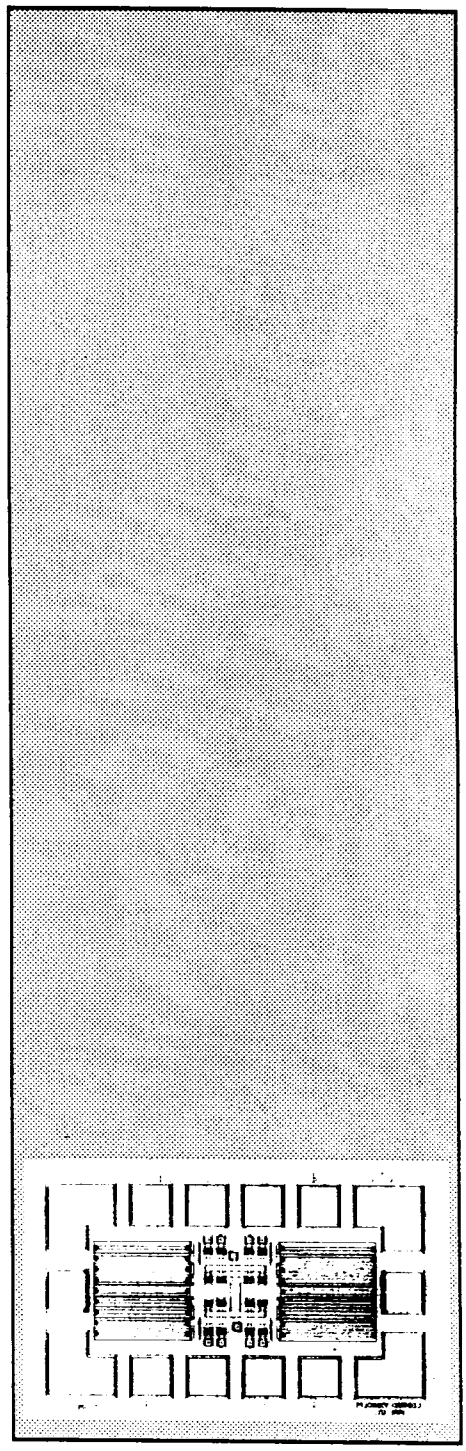
Advanced Product Information

GaAs MMIC SWITCH P35-4245

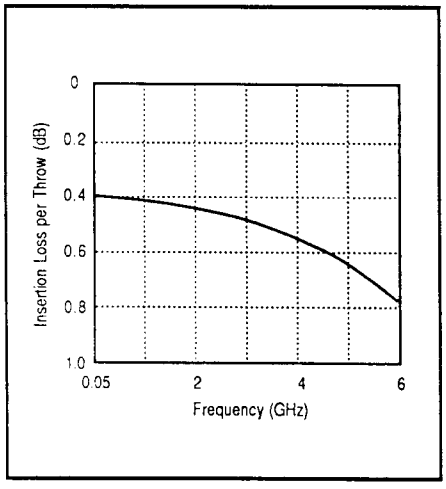
DC to 6GHz DPDT

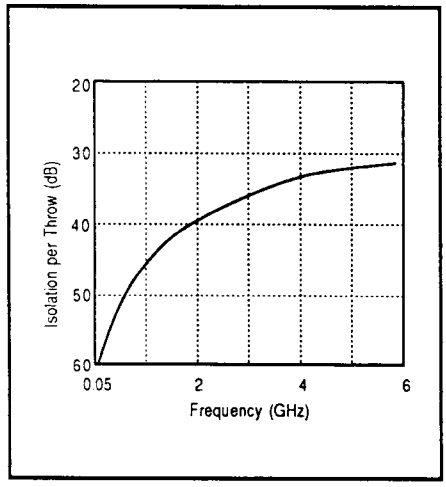


Features

- Broadband performance
- Low insertion loss
- Ultra low DC power consumption
- Fast switching speed, 3ns typical
- Cascadable
- Building block for:
  - Digital Attenuators
  - Digital Phase Shifters
  - Digital Switched Filter Elements

Typical Performance





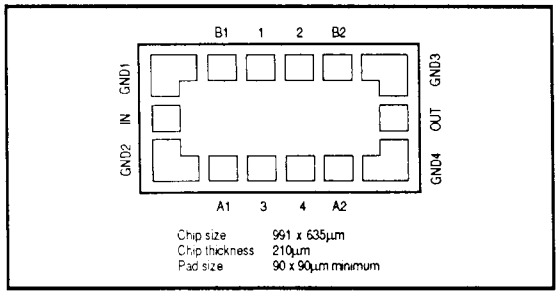
P35- 4245
RF Specification (+20°C)

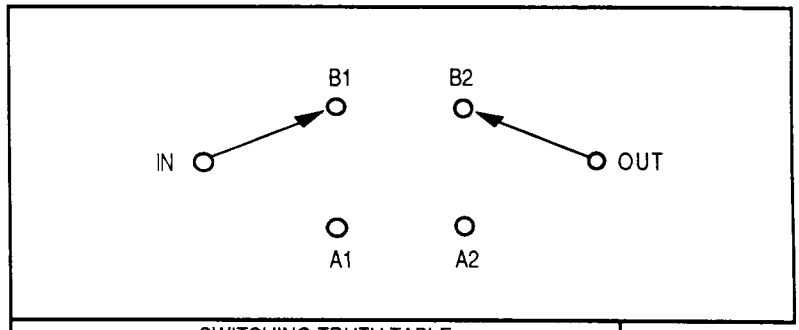
Parameter.	Conditions	Min	Typ	Max	Unit
Insertion loss per throw	DC to 1GHz		0.4	0.5	
	DC to 2GHz		0.5	0.6	dB
	DC to 4GHz		0.6	0.7	
	DC to 6GHz		0.8	0.9	
Isolation per throw	DC to 1GHz	40	45		
	DC to 2GHz	37	42		dB
	DC to 4GHz	29	34		
	DC to 6GHz	27	32		
Return Loss (Input/Output) See Note 1	DC to 1GHz	22			
	DC to 2GHz	20			dB
	DC to 4GHz	15			
	DC to 6GHz	12			
P1dB See Notes 2 & 3	0.1 to 6GHz		27		
	50 MHz		21		dBm
Switching Speed	50% control to 10/90% RF		5		ns

Notes:

1. Low Loss State.
2. Input power at which insertion loss compresses by 1dB.
3. Control Voltage: 0/-5V complimentary.
4. It is recommended that the chip is mounted with epoxy. Bond to all pads using 25µm diameter pure gold wire, thermally compression bonded.

P35- 4245-0 Bond Pad Configuration





SWITCHING TRUTH TABLE

Pad 1 or 3	Pad 2 or 4	IN-B1/OUT-B2	IN-A1/OUT-A2
0V	-5V	LOW LOSS	ISOLATED
-5V	0V	ISOLATED	LOW LOSS

Ordering Information
P35-4245-0 Chip

GEC-Marconi

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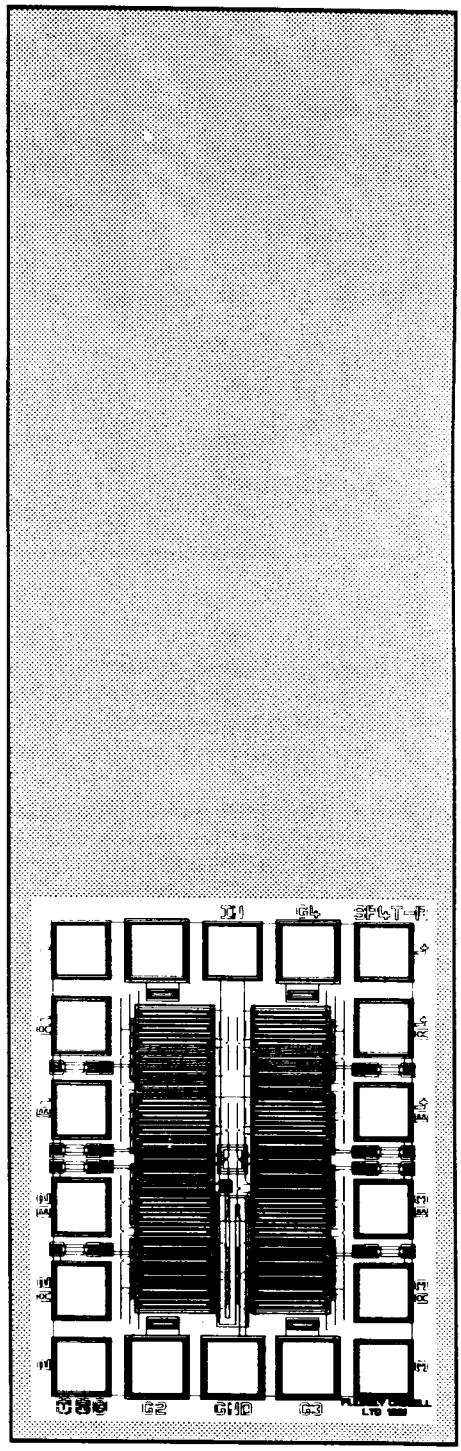
Advanced Product Information

GaAs MMIC SWITCH P35-4250

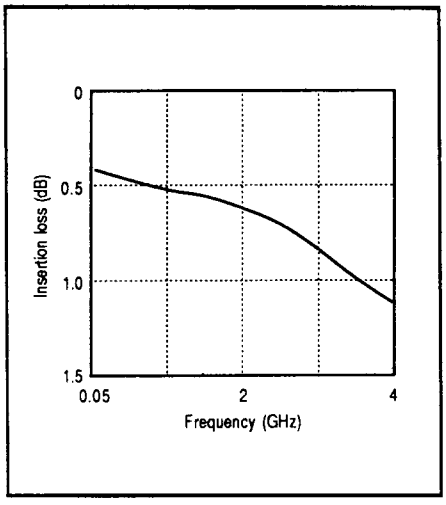
DC to 4GHz SP4T Reflective

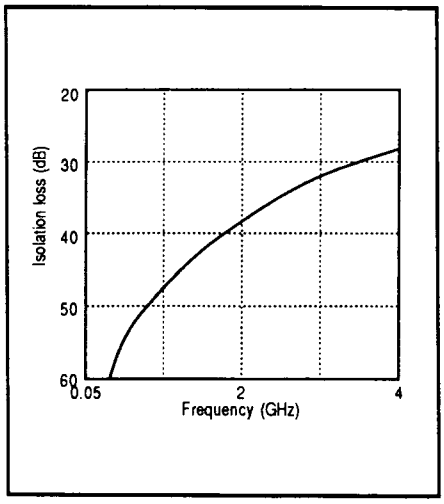


Features

- Broadband performance
- Low insertion loss
- Ultra low DC power consumption
- Fast switching speed, 5ns typical
- Small chip size, 0.67 mm^2

Typical Performance





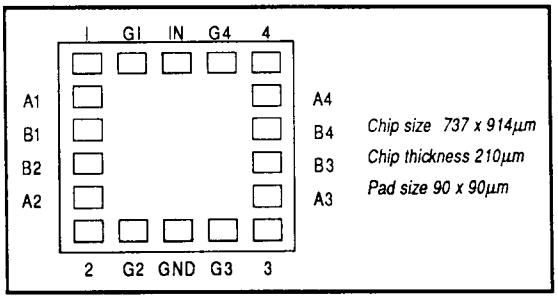
P35- 4250
RF Specification (+20°C)

Parameter	Conditions	Min	Typ	Max	Unit
Insertion loss	DC to 1GHz		0.5	0.6	
	DC to 2GHz		0.6	0.7	dB
	DC to 4GHz		1.1	1.2	
Isolation	DC to 1GHz	45	48		
	DC to 2GHz	35	38		dB
	DC to 4GHz	25	28		
Return Loss	DC to 1GHz		20		
(Input/Output)	DC to 2GHz		14		dB
See Note 1	DC to 4GHz		10		
P1dB					
See Notes 2 & 3	0.1 to 4GHz		27		
	50 MHz		21		dBm
Switching Speed	50% control to 10/90% RF		5		ns

Notes:

1. Low Loss State.
2. Input power at which insertion loss compresses by 1dB.
3. Control Voltage: 0/-5V complimentary.
4. It is recommended that the chip is mounted with epoxy. Bond to all pads using 25µm diameter pure gold wire, thermally compression bonded.

P35- 4250-0 Bond Pad Configuration



SWITCHING TRUTH TABLE												
CONTROL PAD VOLTAGE (V)								PATH FROM "IN" TO			
A1	B1	A2	B2	A3	B3	A4	B4	1	2	3	4
-5	0	0	-5	0	-5	0	-5	ON	OFF	OFF	OFF
0	-5	-5	0	0	-5	0	-5	OFF	ON	OFF	OFF
0	-5	0	-5	-5	0	0	-5	OFF	OFF	ON	OFF
0	-5	0	-5	0	-5	-5	0	OFF	OFF	OFF	ON

'ON' = LOW LOSS STATE

'OFF' = ISOLATED STATE

Ordering Information
P35-4250-0 Chip

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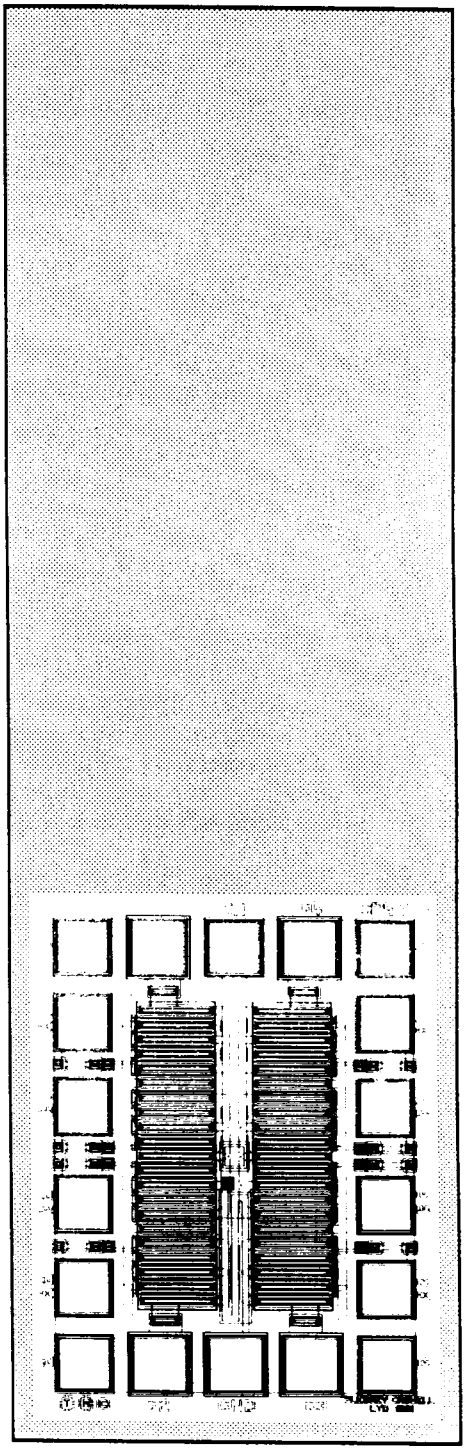
Advanced Product Information

GaAs MMIC SWITCH P35-4252

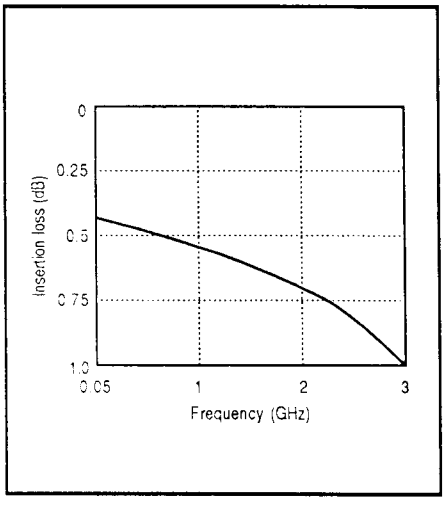
DC to 3GHz SP4T Terminated

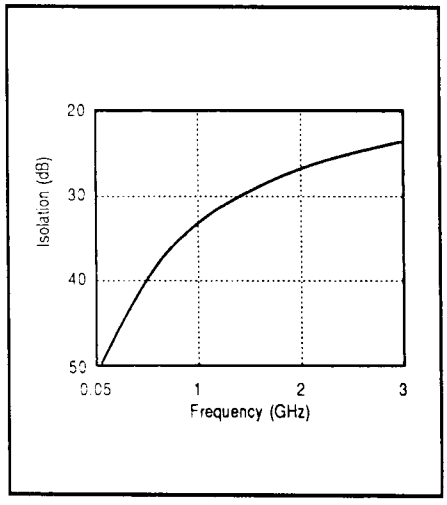


Features

- Broadband performance
- Low insertion loss
- Ultra low DC power consumption
- Fast switching speed, 5ns typical
- Small chip size, 0.67 mm^2
- Very low off state VSWR, 1.06:1 typical

Typical Performance





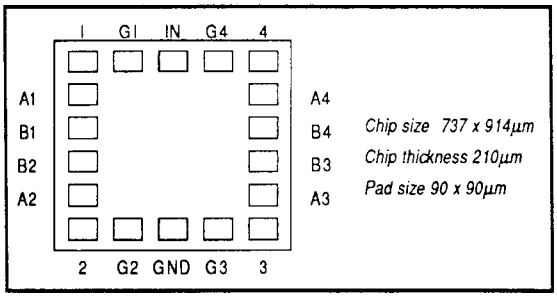
P35- 4252
RF Specification (+20°C)

Parameter	Conditions	Min	Typ	Max	Unit
Insertion loss	DC to 1GHz		0.6	0.7	
	DC to 2GHz		0.7	0.8	dB
	DC to 3GHz		1.0	1.1	
Isolation	DC to 1GHz	30	33		
	DC to 2GHz	24	27		dB
	DC to 3GHz	21	24		
Return Loss	DC to 1GHz		20		
(Input/Output)	DC to 2GHz		14		dB
See Note 1	DC to 3GHz		11		
Return Loss	DC to 1GHz	20			
(Output) See Note 2	DC to 2GHz	20			dB
	DC to 3GHz	20			
P1dB					
See Notes 3 & 4	0.1 to 3GHz		27		
	50 MHz		21		dBm
Switching Speed	50% control to 10/90% RF		5		ns

Notes:

1. Low Loss State. 2. Isolated State
3. Input power at which insertion loss compresses by 1dB.
4. Control Voltage: 0/-5V complimentary.
5. It is recommended that the chip is mounted with epoxy. Bond to all pads using 25µm diameter pure gold wire, thermally compression bonded.

P35- 4252-0 Bond Pad Configuration



SWITCHING TRUTH TABLE												
CONTROL PAD VOLTAGE (V)								PATH FROM "IN" TO			
A1	B1	A2	B2	A3	B3	A4	B4	1	2	3	4
-5	0	0	-5	0	-5	0	-5	ON	OFF	OFF	OFF
0	-5	-5	0	0	-5	0	-5	OFF	ON	OFF	OFF
0	-5	0	-5	-5	0	0	-5	OFF	OFF	ON	OFF
0	-5	0	-5	0	-5	-5	0	OFF	OFF	OFF	ON

'ON' = LOW LOSS STATE
'OFF' = ISOLATED STATE

Ordering Information P35-4252-0 Chip

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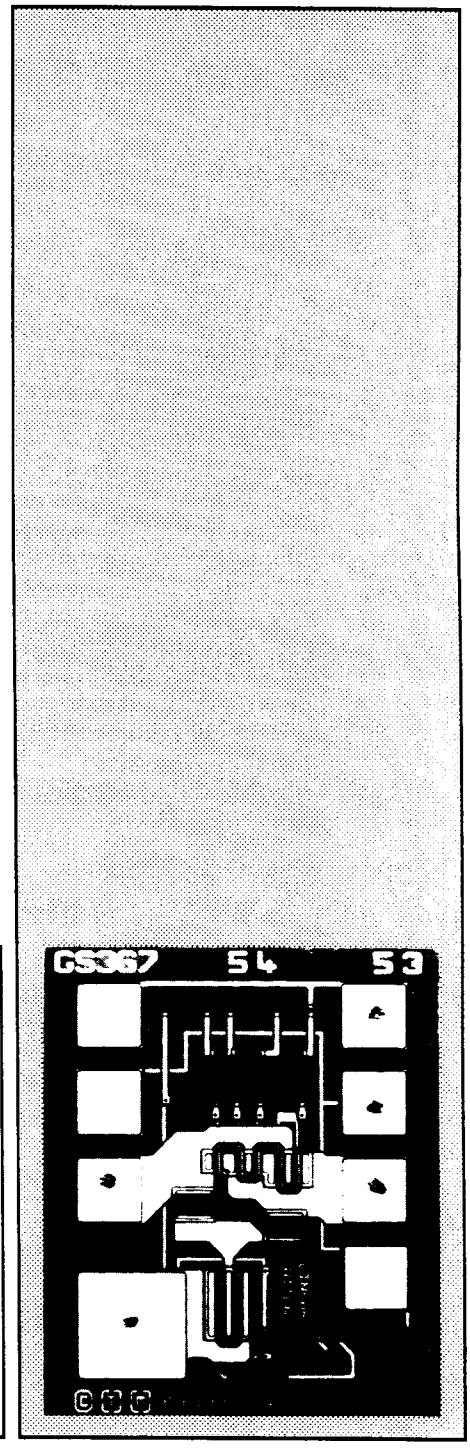
Advanced Product Information

GaAs MMIC ATTENUATOR P35-4300

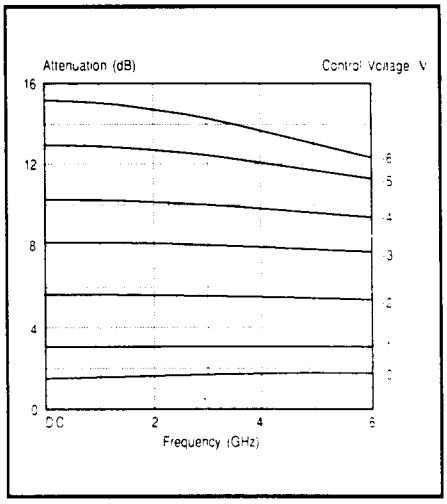
DC to 6 GHz Linear Voltage Variable

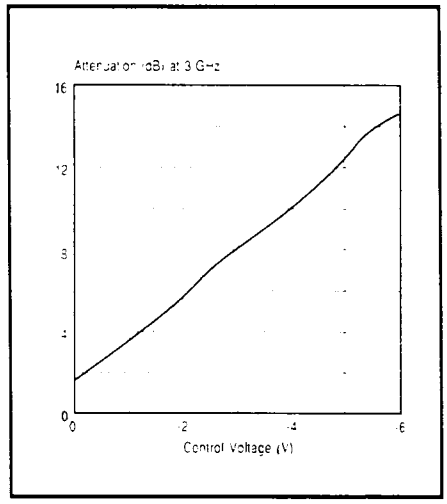


Features

- Broadband performance
- Low insertion loss
- >10 dB attenuation range to 6 GHz
- Low VSWRs
- Linear attenuation with control voltage
- Available in chip form or surface mount package

Typical Performance





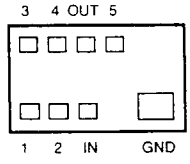
P35- 4300
RF Specification (+20°C)

Parameter	Conditions	Min	Typ	Max	Unit
Insertion Loss	DC to 6 GHz		2	2.5	dB
Attenuation Range	3 GHz	10	13		dB
Attenuation Change with Control Voltage	3 GHz		2		dB/V
VSWR	Input/Output		2:1		
P 1dB	*See note 1*		20		dBm
Control Voltage	*See note 2*	-6		0	V
Control Current				20	mA
Settling Time	50% control to 95% attenuation		15		ns

Notes:

1. Input power at which attenuation changes by 1 dB.
2. Two negative complimentary voltages, VC1 and VC2 are required i.e. VC1 + VC2 = -6V.
3. Back of package should be grounded.
4. It is recommended that the chip is mounted with epoxy. Bond to all pads using 25µm diameter pure gold wire, thermally compression bonded.

P35- 4300-0 Bond Pad Configuration



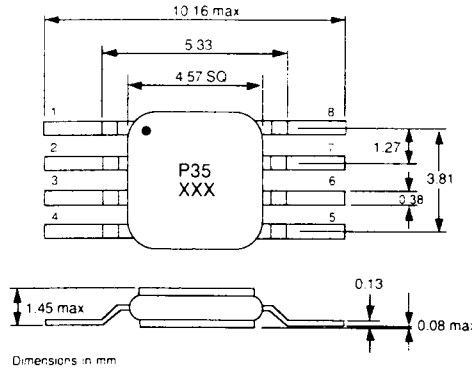
Pad	Function
1	VC1
2	VC2
3	VC1
4	VC2
5	VC2
IN	RF Input
OUT	RF Output
GND	Ground

Chip size 889 x 762 µm

Chip thickness 210 µm

Pad size 120 x 120 µm min.

P35-4300-1 Outline Dimensions / Pin Configuration



Pin connection details

Pin	Connection
1	Ground
2	VC1
3	RF Input
4	Ground
5	Ground
6	RF Output
7	VC2
8	Ground

Functional table of attenuator

VC1	VC2	RF_{IN} - RF_{OUT}
0V	-6V	Lowest Loss
-6V	0V	Highest Loss

GEC-Marconi

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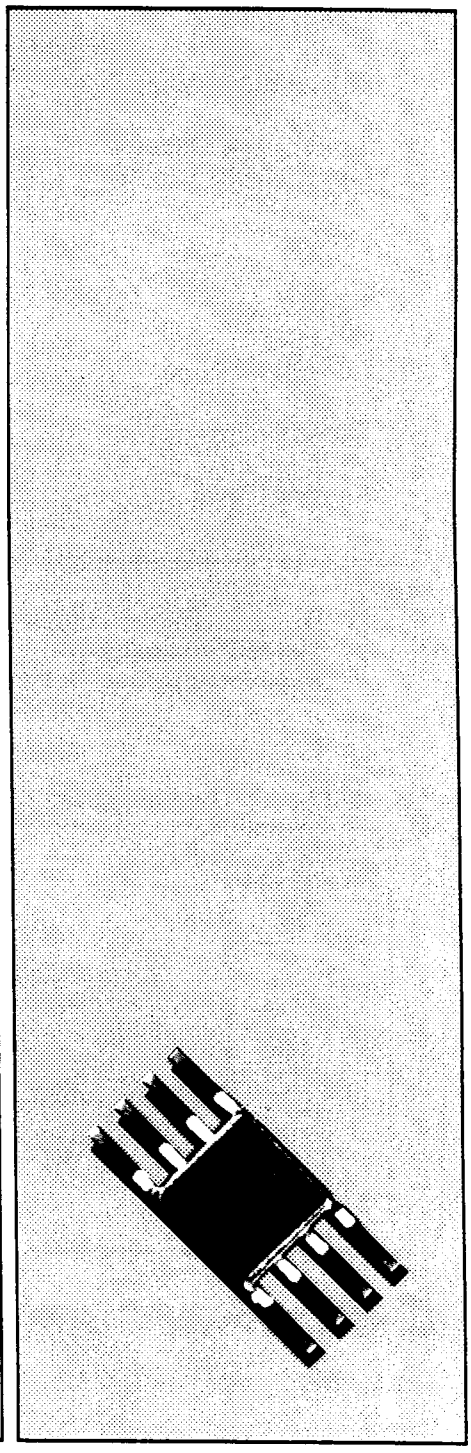
Advanced Product Information

GaAs MMIC ATTENUATOR P35-4301

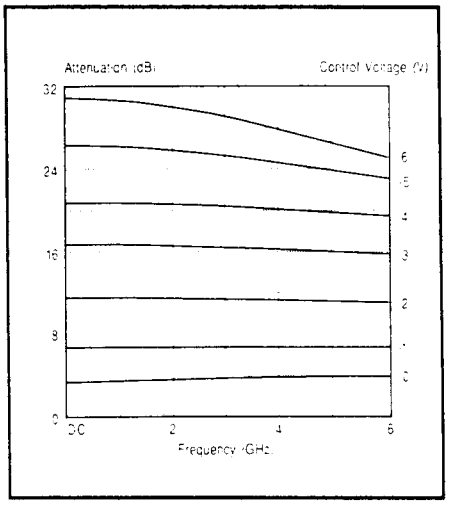
DC to 6 GHz Linear Voltage Variable

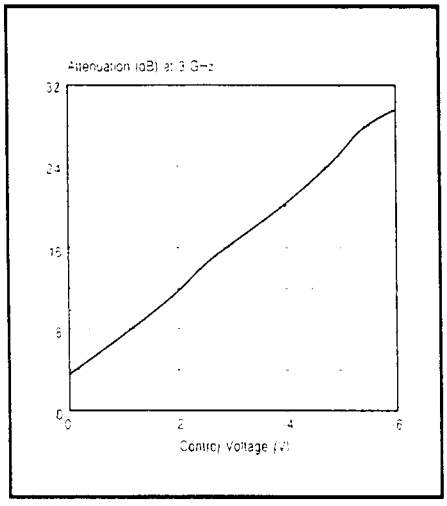


Features

- Broadband performance
- Low insertion loss
- >20 dB attenuation range to 6 GHz
- Low VSWRs
- Linear attenuation with control voltage
- Hermetic surface mount package

Typical Performance





P35- 4301
RF Specification (+20°C)

Parameter	Conditions	Min	Typ	Max	Unit
Insertion Loss	DC to 6 GHz		4	5	dB
Attenuation Range	3 GHz	20	25		dB
Attenuation Change with Control Voltage	3 GHz		4		dB/V
VSWR	Input/Output		2:1		
P 1dB	*See note 1*		20		dBm
Control Voltage	*See note 2*	-6		0	V
Control Current				20	mA
Settling Time	50% control to 95% attenuation		20		ns

Notes:

1. Input power at which attenuation changes by 1 dB.
2. Two negative complimentary voltages, VC1 and VC2 are required i.e. VC1 + VC2 = -6V.
3. Back of package should be grounded.

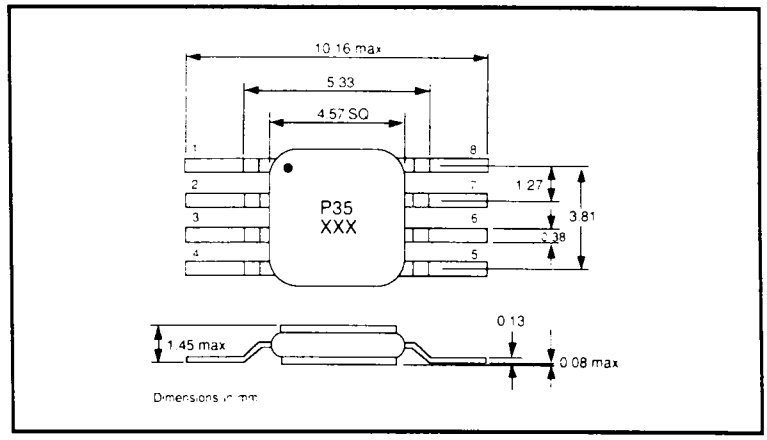
P35- 4301-1 Outline Dimensions and Pin Configuration

Pin connection details

Pin	Connection
1	Ground
2	VC1
3	RF Input
4	Ground
5	Ground
6	RF Output
7	VC2
8	Ground

Functional table of attenuator

VC1	VC2	RF_{IN} - RF_{OUT}
0V	-6V	Lowest Loss
-6V	0V	Highest Loss



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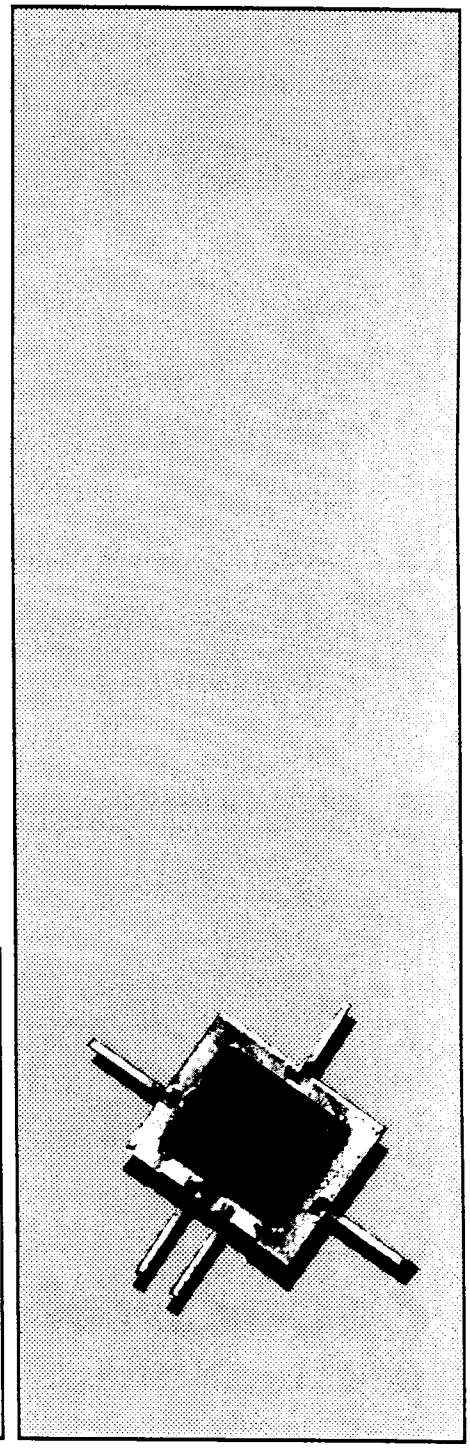
GEC-Marconi

Advanced Product Information

GaAs MMIC ATTENUATOR P35-4302

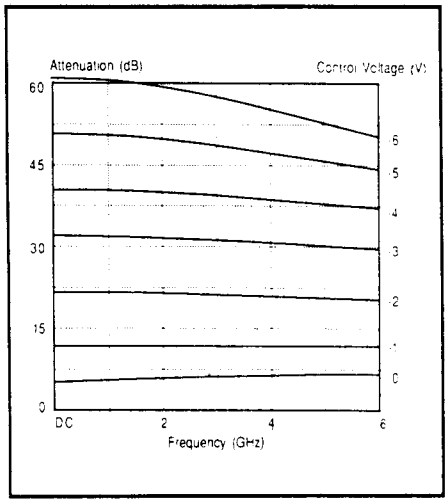
DC to 6 GHz Linear Voltage Variable

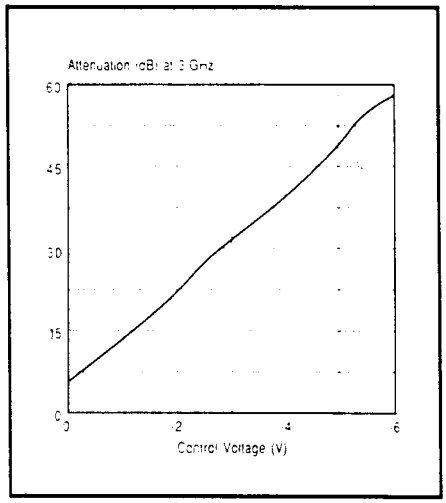


Features

- Broadband performance
- Low insertion loss
- >40 dB attenuation range to 6 GHz
- Low VSWRs
- Linear attenuation with control voltage
- Hermetic ceramic package

Typical Performance





GEC-Marconi Materials Technology Limited

P35- 4302
RF Specification (+20°C)

Parameter	Conditions	Min	Typ	Max	Unit
Insertion Loss	DC to 6 GHz		7	9	dB
Attenuation Range	3 GHz	40	50		dB
Attenuation Change with Control Voltage	3 GHz		8		dB/V
VSWR	Input/Output		2:1		
P 1dB	*See note 1*		20		dBm
Control Voltage	*See note 2*	-6		0	V
Control Current				40	mA
Settling Time	50% control to 95% attenuation		20		ns

Notes:

1. Input power at which attenuation changes by 1 dB.
2. Two negative complimentary voltages, VC1 and VC2 are required i.e. VC1 + VC2 = -6V.
3. Back of package should be grounded.

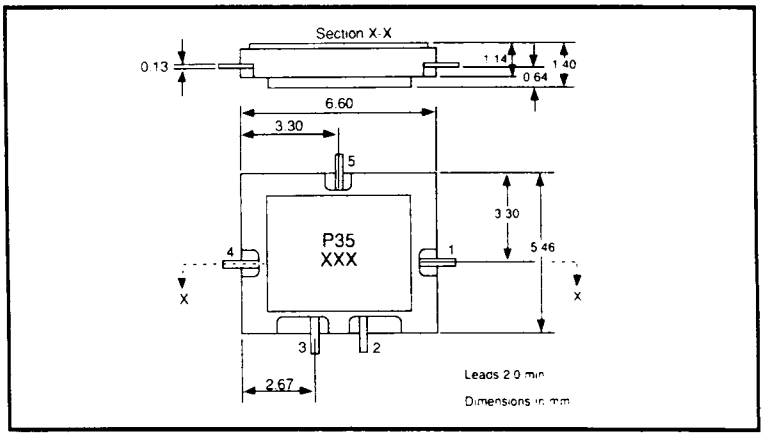
P35- 4302-1 Outline Dimensions and Pin Configuration

Pin connection details

Pin	Connection
1	RF Input
2	VC1
3	VC2
4	RF Output
5	Ground

Functional table of attenuator

VC1	VC2	RF_{IN} - RF_{OUT}
0V	-6V	Lowest Loss
-6V	0V	Highest Loss



GEC-Marconi

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