

RF PRODUCTS

HIGH PERFORMANCE COMPONENTS FOR COMMUNICATIONS



QUALITY AND EXPERIENCE IN RF TECHNOLOGY



A PROVEN RECORD

Since 1974 Semelab has been supplying high quality, high reliability semiconductors and modules. Customers around the world are using Semelab devices in applications where precision, consistency and reliable service are imperative. Equipment as diverse as television and radio transmitters, space vehicles, aircraft equipment and banking systems are all using Semelab products.

IN-HOUSE FAB, ASSEMBLY, TEST AND ENGINEERING

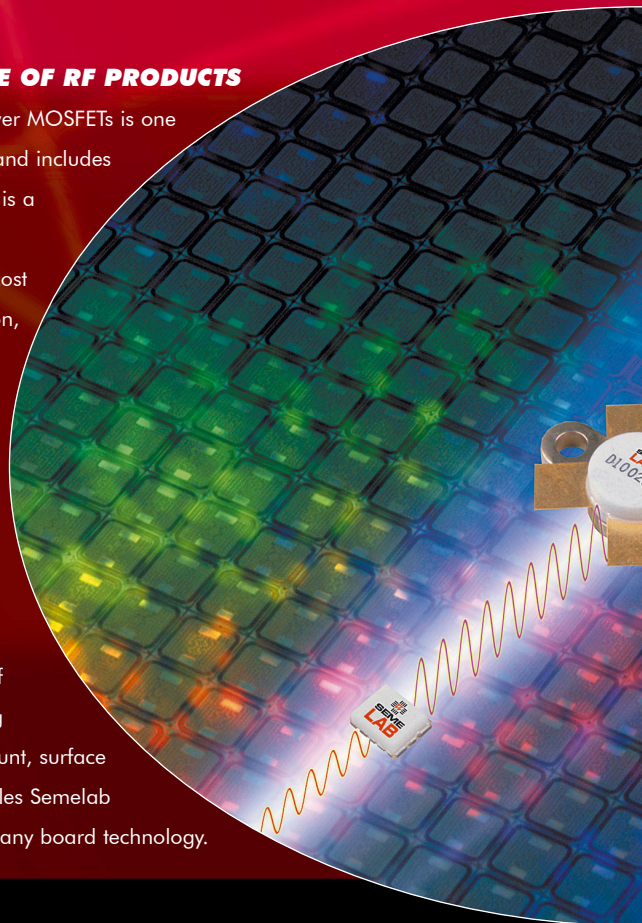
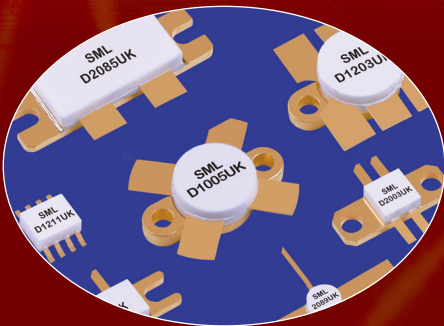
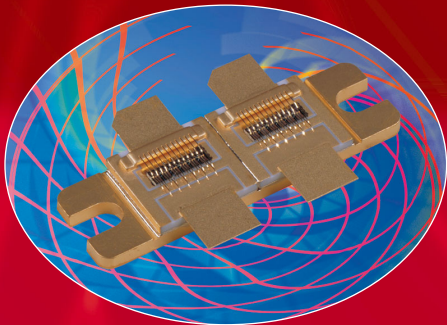
Semelab has its own ISO 9000 approved wafer fab at Glenrothes in Scotland, and performs assembly, screening and test operations at the company's facility in Lutterworth, England. All aspects of design, processing, testing, packaging and qualification take place within Semelab, thereby ensuring complete control over quality and reliability.

Semelab holds quality approvals for processes and products from major standards organisations, including ESA (European Space Agency), DSCC, ISO and CECC amongst many others.

EXTENSIVE RANGE OF RF PRODUCTS

Semelab's range of power MOSFETs is one of the widest available and includes over 90 devices. There is a device for almost any application - from low cost to ultra-high specification, from 750mW to over 350W, and for frequencies to 1GHz.

Parts for 12.5V and 28V are available in both single-ended and push-pull formats. A comprehensive range of package styles including conventional flange mount, surface mount and plastic enables Semelab devices to be used with any board technology.



PERFORMANCE AND FLEXIBILITY

TECHNICAL EXCELLENCE

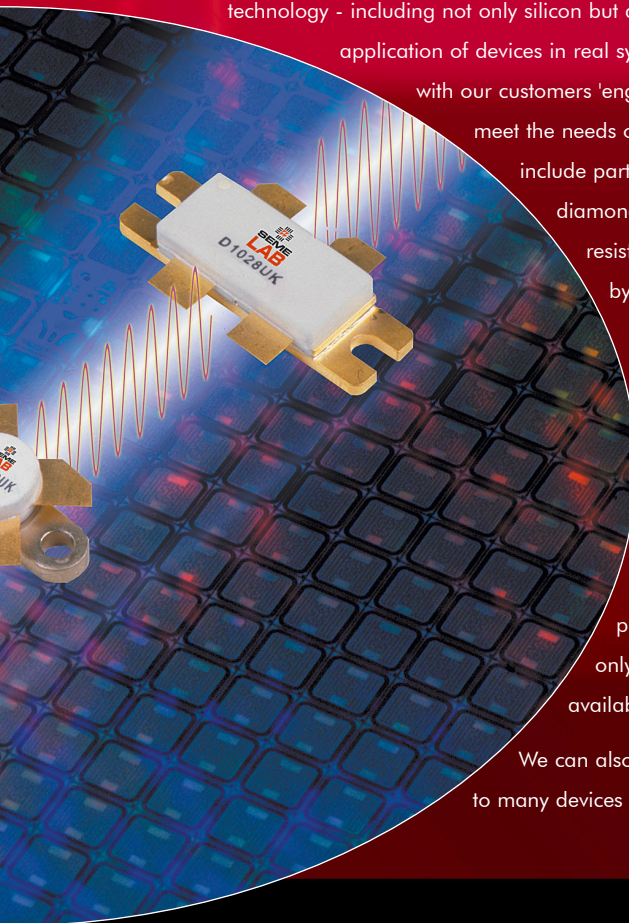
Semelab RF MOSFETs are manufactured using a unique silicon Vertical DMOS process with gold metalisation which gives high performance and maximum reliability at high power levels. Among the benefits of the Semelab process are:

- Ultra wide band - 1MHz to 1GHz
- Wide power range - 750mW to 350W
- Exceptionally low feedback capacitance resulting in:
 - High gain via reduced Miller Effect (20dB VHF, 16dB UHF)
 - High stability
 - Easier design
- Low $R_{ds(on)}$ for high efficiency (>50%)
- High breakdown voltage (typically 85V) for exceptional ruggedness (up to 20:1 VSWR withstand)
- Excellent thermal stability



PACKAGING AND SCREENING OPTIONS

We can provide alternative packaging and customised selection, testing and screening to meet customers' detailed specifications. Our specialist team has experience in all aspects of RF technology - including not only silicon but also package technology and the application of devices in real systems. As a result we are able to liaise with our customers 'engineer-to-engineer' and supply devices that meet the needs of the application precisely. Examples include parts developed by Semelab which employ a diamond package for the lowest possible thermal resistance, and truly hermetic products supplied by Semelab for space applications.



CONTINUITY OF SUPPLY

Semelab has a policy of continuing supply on all products and has never discontinued an RF device. We are committed to supporting all our RF products indefinitely, and will build any product required by our customers provided only that supplies of the chosen package are available.

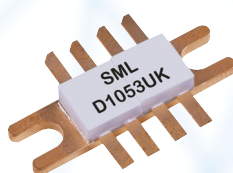
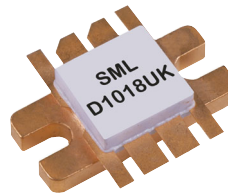
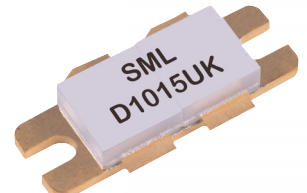
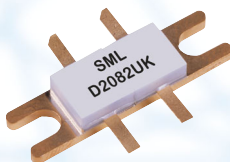
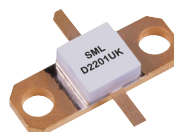
We can also provide alternatives from within our range to many devices discontinued by other manufacturers.

28V DEVICES

FOR FREQUENCIES TO 1GHZ

- Ultra-high linearity, low $R_{ds(on)}$ and high efficiency
- Very high gain and exceptionally rugged
- We will be pleased to discuss your requirements for die and package configurations not listed below

Device	Min. Output Power (W)	Minimum Efficiency (%)	Minimum Gain (dB)	Test Frequency (MHz)	Operating Voltage (V)	Package Type	Single-Ended/ Push-Pull	Application Frequency	Active FET Configuration	Breakdown Voltage (V)
D1001UK	20W	50%	16dB	175MHz	28V	DA	SE	1-175MHz	1	70V
D1002UK	40W	50%	16dB	175MHz	28V	DA	SE	1-175MHz	2	70V
D1003UK	60W	50%	16dB	175MHz	28V	DM	SE	1-175MHz	3	70V
D1004UK	80W	50%	16dB	175MHz	28V	DT	SE	1-175MHz	4	70V
D1005UK	80W	50%	16dB	175MHz	28V	DM	SE	1-175MHz	4	70V
D1006UK	120W	50%	14dB	175MHz	28V	DV	SE	1-175MHz	6	70V
D1007UK	40W	50%	13dB	400MHz	28V	DK	PP	1-500MHz	1+1	70V
D1008UK	80W	50%	13dB	400MHz	28V	DK	PP	1-500MHz	2+2	70V
D1009UK	150W	50%	8dB	400MHz	28V	DR	PP	1-500MHz	4+4	70V
D1010UK	125W	60%	10dB	400MHz	28V	DR	PP	1-500MHz	4+4	70V
D1011UK	10W	50%	13dB	1000MHz	28V	SO8	SE	1-1000MHz	1	70V
D1012UK	100W	50%	10dB	500MHz	28V	DH	PP	1-500MHz	3+3	70V
D1013UK	10W	50%	13dB	500MHz	28V	DP	SE	1-500MHz	1	70V
D1014UK	20W	60%	13dB	500MHz	28V	DP	SE	1-500MHz	2	70V
D1015UK	125W	50%	13dB	400MHz	28V	DH	PP	1-400MHz	4+4	70V
D1016UK	40W	50%	13dB	400MHz	28V	DQ	PP	1-500MHz	1+1	70V
D1017UK	150W	50%	13dB	175MHz	28V	DM	SE	1-200MHz	6	70V
D1018UK	100W	50%	10dB	500MHz	28V	DD	PP	1-500MHz	3+3	70V
D1019UK	20W	50%	16dB	175MHz	28V	DW	SE	1-175MHz	1	70V
D1020UK	150W	50%	10dB	400MHz	28V	DR	PP	1-400MHz	5+5	70V
D1021UK	125W	50%	13dB	400MHz	28V	DK	PP	1-400MHz	4+4	70V
D1022UK	100W	50%	10dB	500MHz	28V	DK	PP	1-500MHz	3+3	70V
D1023UK	60W	50%	16dB	175MHz	28V	DT	SE	1-500MHz	3	70V
D1024UK	40W	50%	13dB	400MHz	28V	DW	PP	1-500MHz	1+1	70V
D1027UK	150W	50%	13dB	175MHz	28V	DR	PP	1-200MHz	6+6	70V
D1028UK	300W	60%	13dB	175MHz	28V	DR	PP	1-200MHz	6+6	70V
D1029UK	350W	60%	13dB	175MHz	28V	DR	PP	1-200MHz	7+7	70V
D1031UK	10W	50%	13dB	1000MHz	28V	F-0127	SE	1-1000MHz	1	70V
D1053UK	50W	45%	7.5dB	1000MHz	28V	DB	PP	1-1000MHz	2+2	70V
D1082UK	4W	40%	13dB	200MHz	28V	TO251	SE	1-200MHz	1	70V
D1083UK	4W	40%	13dB	200MHz	28V	TO263	SE	1-200MHz	1	70V
D1084UK	4W	40%	13dB	200MHz	28V	TO220	SE	1-200MHz	1	70V
D1093UK	10W	50%	13dB	500MHz	28V	SOT171	SE	1-1000MHz	4	65V
D1094UK	20W	50%	11dB	500MHz	28V	SOT171	SE	1-1000MHz	6	65V

DA Package**DB** Package**DD** Package**DH** Package**DK** Package**DM** Package**DP** Package**DP** Flangeless Package

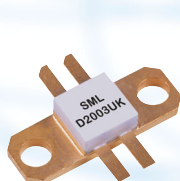
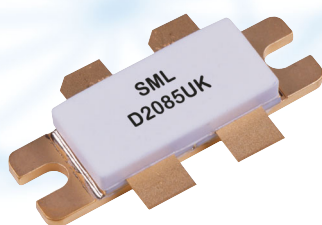
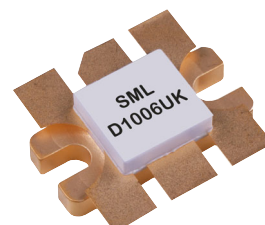
Semelab can package devices as you require and test to your specifications - please call to discuss your needs

28V DEVICES**OPTIMISED FOR HIGHER FREQUENCIES**

The D20 series is optimised for performance at higher frequencies:

- High gain at higher frequencies
- Low capacitance
- Excellent linearity
- Low $R_{ds(on)}$
- The exceptional ruggedness of the D10 series is retained
- We will be pleased to discuss your requirements for die and package configurations not listed below

Device	Min. Output Power (W)	Minimum Efficiency (%)	Minimum Gain (dB)	Test Frequency (MHz)	Operating Voltage (V)	Package Type	Single-Ended/ Push-Pull	Application Frequency	Active FET Configuration	Breakdown Voltage (V)
D2001UK	2.5W	40%	13dB	1000MHz	28V	DP	SE	1-1000MHz	1	65V
D2002UK	5W	40%	13dB	1000MHz	28V	DP	SE	1-1000MHz	2	65V
D2003UK	5W	40%	13dB	1000MHz	28V	DQ	PP	1-1000MHz	1+1	65V
D2004UK	10W	40%	10dB	1000MHz	28V	DK	PP	1-1000MHz	2+2	65V
D2005UK	7.5W	40%	13dB	1000MHz	28V	DP	SE	1-1000MHz	3	65V
D2006UK	15W	40%	13dB	1000MHz	28V	DK	PP	1-1000MHz	3+3	65V
D2007UK	5W	40%	13dB	400MHz	28V	DA	SE	1-500MHz	2	65V
D2008UK	5W	40%	13dB	400MHz	28V	TO-39	SE	1-400MHz	2	65V
D2010UK	20W	40%	10dB	1000MHz	28V	DP	SE	1-1000MHz	8	65V
D2011UK	20W	40%	10dB	1000MHz	28V	DBC1	SE	1-1000MHz	8	65V
D2012UK	10W	40%	10dB	1000MHz	28V	DP	SE	1-1000MHz	4	65V
D2013UK	20W	40%	10dB	1000MHz	28V	DK	PP	1-1000MHz	4+4	65V
D2014UK	2.5W	40%	13dB	500MHz	28V	SOT171	SE	1-1000MHz	1	65V
D2015UK	5W	40%	13dB	500MHz	28V	SOT171	SE	1-1000MHz	2	65V
D2017UK	5W	40%	13dB	1000MHz	28V	Flangeless DP	SE	1-1000MHz	2	65V
D2018UK	10W	40%	13dB	1000MHz	28V	Flangeless DP	SE	1-1000MHz	4	65V
D2019UK	2.5W	40%	13dB	1000MHz	28V	SO8	SE	1-1000MHz	1	65V
D2020UK	5W	40%	13dB	1000MHz	28V	SO8	SE	1-1000MHz	2	65V
D2021UK	7.5W	40%	13dB	1000MHz	28V	SO8	SE	1-1000MHz	3	65V
D2024UK	10W	40%	10dB	1000MHz	28V	SO8	SE	1-1000MHz	4	65V
D2029UK	2.5W	40%	13dB	1000MHz	28V	F-0127	SE	1-1000MHz	1	65V
D2030UK	5W	40%	13dB	1000MHz	28V	F-0127	SE	1-1000MHz	2	65V
D2031UK	7.5W	40%	13dB	1000MHz	28V	F-0127	SE	1-1000MHz	3	65V
D2053UK	5W	40%	13dB	1000MHz	28V	DBC4	PP	1-1000MHz	1+1	65V
D2054UK	10W	40%	13dB	1000MHz	28V	DBC4	PP	1-1000MHz	2+2	65V
D2081UK	0.75W	40%	11dB	1000MHz	28V	SOT223	SE	1-1000MHz	1	65V
D2082UK	40W	40%	8dB	1000MHz	28V	DK	PP	1-1000MHz	8+8	65V
D2083UK	80W	40%	8dB	1000MHz	28V	DH	PP	1-1000MHz	12+12	65V
D2084UK	100W	40%	8dB	900MHz	28V	DR	PP	1-1000MHz	16+16	65V
D2085UK	120W	40%	8dB	800MHz	28V	DR	PP	1-1000MHz	20+20	65V
D2089UK	1W	40%	8dB	30MHz	28V	E16	SE	1-1000MHz	1	65V

DQ Package**DR** Package**DT** Package**DV** Package**DW** Package**E16** Package**SOT171** Package**TO39** Package

Semelab can package devices as you require and test to your specifications - please call to discuss your needs

12.5V DEVICES
IN RANGES TO 400MHZ AND 1GHZ

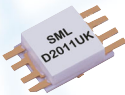
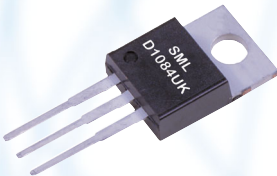
Device	Min. Output Power (W)	Minimum Efficiency (%)	Minimum Gain (dB)	Test Frequency (MHz)	Operating Voltage (V)	Package Type	Single-Ended/ Push-Pull	Application Frequency	Active FET Configuration	Breakdown Voltage (V)
D1201UK	10W	50%	10dB	500MHz	12.5V	DP	SE	1-500MHz	1	40V
D1202UK	20W	50%	10dB	500MHz	12.5V	DP	SE	1-500MHz	2	40V
D1203UK	30W	50%	10dB	500MHz	12.5V	DM	SE	1-500MHz	3	40V
D1204UK	30W	50%	10dB	500MHz	12.5V	DT	SE	1-500MHz	3	40V
D1207UK	20W	50%	10dB	500MHz	12.5V	DQ	PP	1-500MHz	1+1	40V
D1208UK	40W	50%	10dB	400MHz	12.5V	DK	PP	1-500MHz	2+2	40V
D1209UK	20W	50%	10dB	400MHz	12.5V	DK	PP	1-500MHz	1+1	40V
D1210UK	10W	50%	10dB	175MHz	12.5V	DA	SE	1-175MHz	1	40V
D1211UK	10W	50%	10dB	500MHz	12.5V	SO8	SE	1-500MHz	1	40V
D1212UK	60W	50%	10dB	500MHz	12.5V	DH	PP	1-500MHz	3+3	40V
D1213UK	6W	50%	10dB	500MHz	7.2V	DBC1	SE	1-500MHz	2	40V
D1217UK	40W	50%	10dB	400MHz	12.5V	DD	PP	1-500MHz	2+2	40V
D1218UK	60W	50%	10dB	500MHz	12.5V	DD	PP	1-500MHz	3+3	40V
D1221UK	10W	50%	10dB	500MHz	12.5V	DW	SE	1-500MHz	1	40V
D1222UK	60W	50%	10dB	500MHz	12.2V	DK	PP	1-500MHz	3+3	40V
D1231UK	10W	50%	10dB	500MHz	12.5V	F-0127	SE	1-500MHz	1	40V
D1260UK	60W	50%	10dB	175MHz	12.5V	DT	SE	1-175MHz	4	40V
D2201UK	2.5W	40%	10dB	1000MHz	12.5V	DP	SE	1-1000MHz	1	40V
D2202UK	5W	40%	10dB	1000MHz	12.5V	DP	SE	1-1000MHz	2	40V
D2203UK	5W	40%	10dB	1000MHz	12.5V	DQ	PP	1-1000MHz	1+1	40V
D2204UK	20W	40%	10dB	900MHz	12.5V	DT	SE	1-1000MHz	8	40V
D2205UK	7.5W	40%	10dB	1000MHz	12.5V	DP	SE	1-1000MHz	3	40V
D2208UK	40W	40%	10dB	500MHz	12.5V	DK	PP	1-1000MHz	8+8	40V
D2210UK	20W	40%	10dB	1000MHz	12.5V	DP	SE	1-1000MHz	8	40V
D2211UK	10W	40%	7dB	1000MHz	7.2V	DBC1	SE	1-1000MHz	8	40V
D2212UK	10W	40%	10dB	1000MHz	12.5V	DP	SE	1-1000MHz	4	40V
D2213UK	20W	40%	10dB	1000MHz	12.5V	DK	PP	1-1000MHz	4+4	40V
D2214UK	10W	40%	10dB	1000MHz	12.5V	Flangeless DP	SE	1-1000MHz	4	40V
D2218UK	20W	40%	10dB	1000MHz	12.5V	Flangeless DP	SE	1-1000MHz	8	40V
D2219UK	2.5W	40%	10dB	1000MHz	12.5V	SO8	SE	1-1000MHz	1	40V
D2220UK	5W	40%	10dB	1000MHz	12.5V	SO8	SE	1-1000MHz	2	40V
D2221UK	7.5W	40%	10dB	1000MHz	12.5V	SO8	SE	1-1000MHz	3	40V
D2224UK	5W	50%	7dB	850MHz	7.2V	SO8	SE	1-1000MHz	4	40V
D2225UK	5W	40%	10dB	1000MHz	12.5V	SO8	PP	1-1000MHz	1+1	40V
D2229UK	2.5W	40%	10dB	1000MHz	12.5V	F-0127	SE	1-1000MHz	1	40V
D2230UK	5W	40%	10dB	1000MHz	12.5V	F-0127	SE	1-1000MHz	2	40V
D2231UK	7.5W	40%	10dB	1000MHz	12.5V	F-0127	SE	1-1000MHz	3	40V
D2232UK	5W	50%	7dB	850MHz	7.2V	F-0127	SE	1-1000MHz	4	40V
D2253UK	5W	40%	13dB	1000MHz	12.5V	DBC4	PP	1-1000MHz	1+1	40V
D2254UK	10W	40%	10dB	1000MHz	12.5V	DBC4	PP	1-1000MHz	2+2	40V
D2282UK	0.75W	40%	8dB	1000MHz	6V	SOT223	SE	1-1000MHz	1	40V
D2293UK	10W	40%	11dB	500MHz	12.5V	SOT171	SE	1-1000MHz	4	40V
D2294UK	15W	40%	11dB	500MHz	12.5V	SOT171	SE	1-1000MHz	6	40V

TO220P Package

DBC1 Package

DBC4 Package

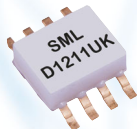
F0127 Package



SO8 Package

SOT223 Package

TO263 Package



Semelab can package devices as you require and test to your specifications - please call to discuss your needs

INNOVATION AND CUSTOM SOLUTIONS
TO PROVIDE THE OPTIMUM DEVICE FOR YOUR NEEDS

AMPLIFIER MODULES



- Semelab can design RF Power Modules to give a compact and rugged single device solution to your amplifier needs.
- High output power (5.5W typically)
- High efficiency (>38%)
- Low intermodulation distortion (IMD> -25dBc)
- Parameters for two of the modules already developed are shown opposite
- Ideal in Private Mobile Radio (PMR) systems.

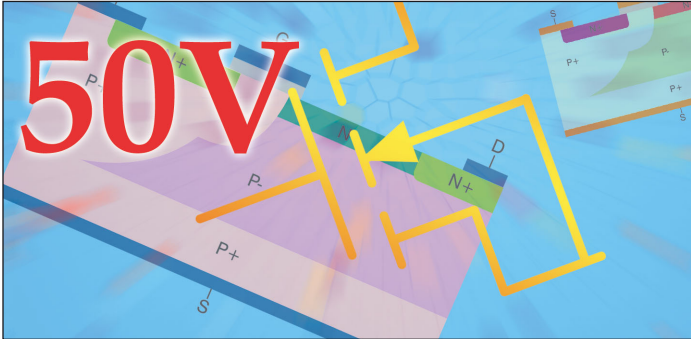
ADDITIONAL FEATURES INCLUDE:

- Operation from 7.2V supply
- Integral enable/disable control of the amplifier
- Unconditionally stable for all loads up to 5:1 VSWR
- Rugged construction
- Copper heatsink for excellent thermal dissipation

Parameter	LMP2003			LMP1603		
	Min.	Typ.	Max.	Min.	Typ.	Max.
Frequency range (MHz)	220		222	150		162
Output power (W)		5.5			5.5	
Gain (dB)	37.4			37.4		
IMD (dBc)	-25			-25		
Second Harmonic Rejection (dB)	25			25		
Third Harmonic Rejection (dB)	35			35		
Input Return Loss (dB)	-10			-11		
Supply Voltage (V)		7.2			7.2	
Supply Current (A)			2			2

Semelab have developed The DBC1 and DBC4 surface mount packages specially for use in low voltage modules. By using these package styles module designers are able to incorporate more silicon and thus retain the same power output as higher voltage products. We will be pleased to discuss your requirements for any Semelab RF die in these innovative package styles.

NEW PRODUCTS IN DEVELOPMENT

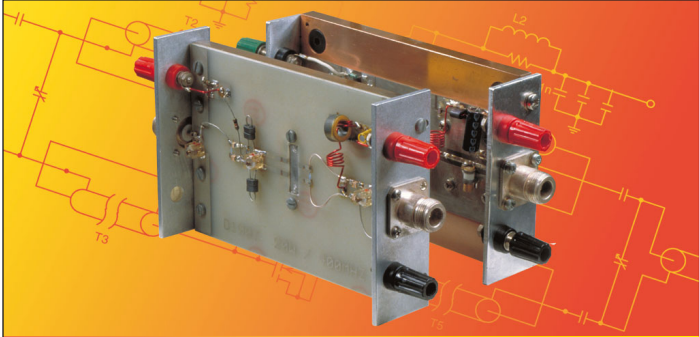


50V DEVICES

The 50V family now in development maintains all the advantages of Semelab MOSFETs - high gain, low capacitance, excellent linearity and exceptional ruggedness - and is ideally suited to broadcast applications.

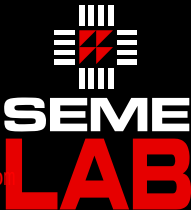
This new generation of 50V parts is suitable for new designs as well as being an alternative to parts declared obsolete by other vendors. Engineering samples are now available, please contact Semelab for details of the production release date.

TESTING TO CUSTOMERS' REQUIREMENTS



Customers' applications often use RF transistors in circumstances that differ from data sheet test conditions, and as a result the performance achieved may not match that specified by the manufacturer. For example, a device employed for broadband use or operated at different frequencies will show variations in gain, power output and efficiency compared with data sheet values.

To ensure Semelab devices meet customers' performance requirements in use we are willing to test all product in the user's test circuit and supply only devices that meet his needs. In this way customers can be certain that all parts supplied will function correctly in their application.



RF Components



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