Low Distortion Internally Matched Power GaAs FETs (X, Ku-Band)

Features

- Low intermodulation distortion
  - IM_3 = -45 dBc at Po = 28 dBm,
  - Single carrier level
- High power
  - P_{1dB} = 39.5 dBm at 14.0 GHz to 14.5 GHz
- High gain
  - G_{1dB} = 5.0 dB at 14.0 GHz to 14.5 GHz
- Broad band internally matched
- Hermetically sealed package

RF Performance Specifications (Ta = 25° C)

Characteristics	Symbol	Condition	Unit	Min.	Typ.	Max
Output Power at 1dB Compression Point	P_{1dB}	V_{DS} = 9V f = 14.0 ~ 14.5 GHz	dBm	38.5	39.5	–
Power Gain at 1dB Compression Point	G_{1dB}		dB	4.0	5.0	–
Drain Current	I_{DS1}		A	–	3.4	4.4
Gain Flatness	ΔG		dB	–	–	±0.8
Power Added Efficiency	η_{add}		%	–	20	–
3rd Order Intermodulation Distortion	IM_3	Note 1	dBc	-42	-45	–
Drain Current	I_{DS2}		A	–	3.4	4.4
Channel-Temperature Rise	ΔT_{ch}	$V_{DS}xI_{DS}xR_{th(c-c)}$	°C	–	–	80

Note 1: 2 Tone Test (Pout = 28 dBm Single Carrier Level).

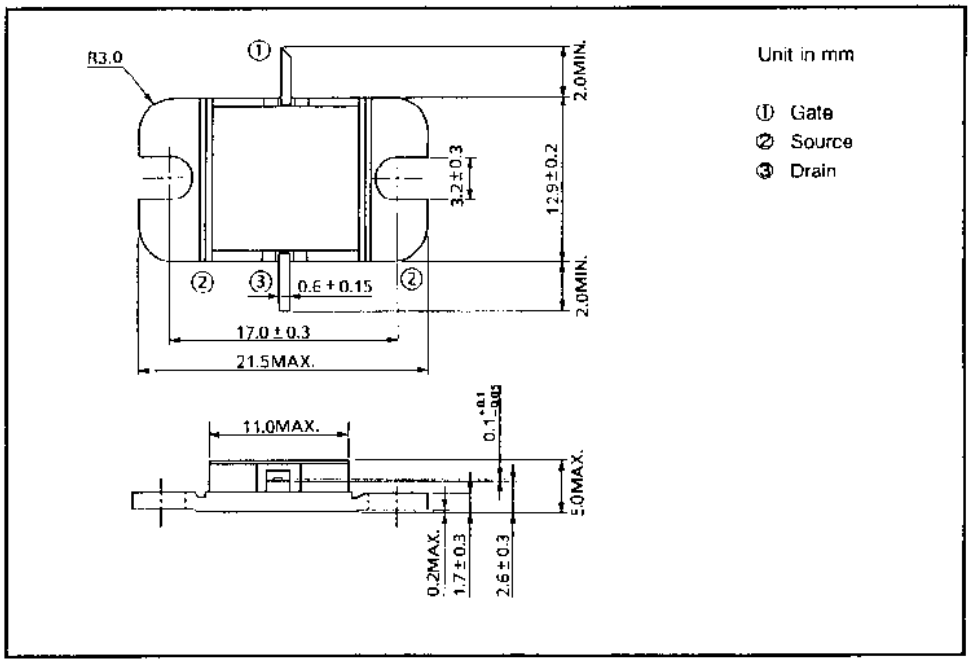
Electrical Characteristics (Ta = 25° C)

Characteristic	Symbol	Condition	Unit	Min.	Typ.	Max
Trans-conductance	gm	V_{DS} = 3V I_{DS} = 4.0A	mS	–	2400	–
Pinch-off Voltage	V_{GSoff}	V_{DS} = 3V I_{DS} = 120mA	V	-2	-3.5	-5
Saturated Drain Current	I_{DSS}	V_{DS} = 3V V_{GS} = 0V	A	–	8.0	10.4
Gate-Source Breakdown Voltage	V_{GSO}	I_{GS} = -120μA	V	-5	–	–
Thermal Resistance	$R_{th\ (c-c)}$	Channel to case	°C/W	–	1.6	2.5

Absolute Maximum Ratings (Ta = 25° C)

Characteristic	Symbol	Unit	Rating
Drain-Source Voltage	V_{DS}	V	15
Gate-Source Voltage	V_{GS}	V	-5
Drain Current	I_{DS}	A	10.4
Total Power Dissipation (T_c = 25°C)	P_T	W	60
Channel Temperature	T_{ch}	˚C	175
Storage Temperature	T_{stg}	˚C	-65~175

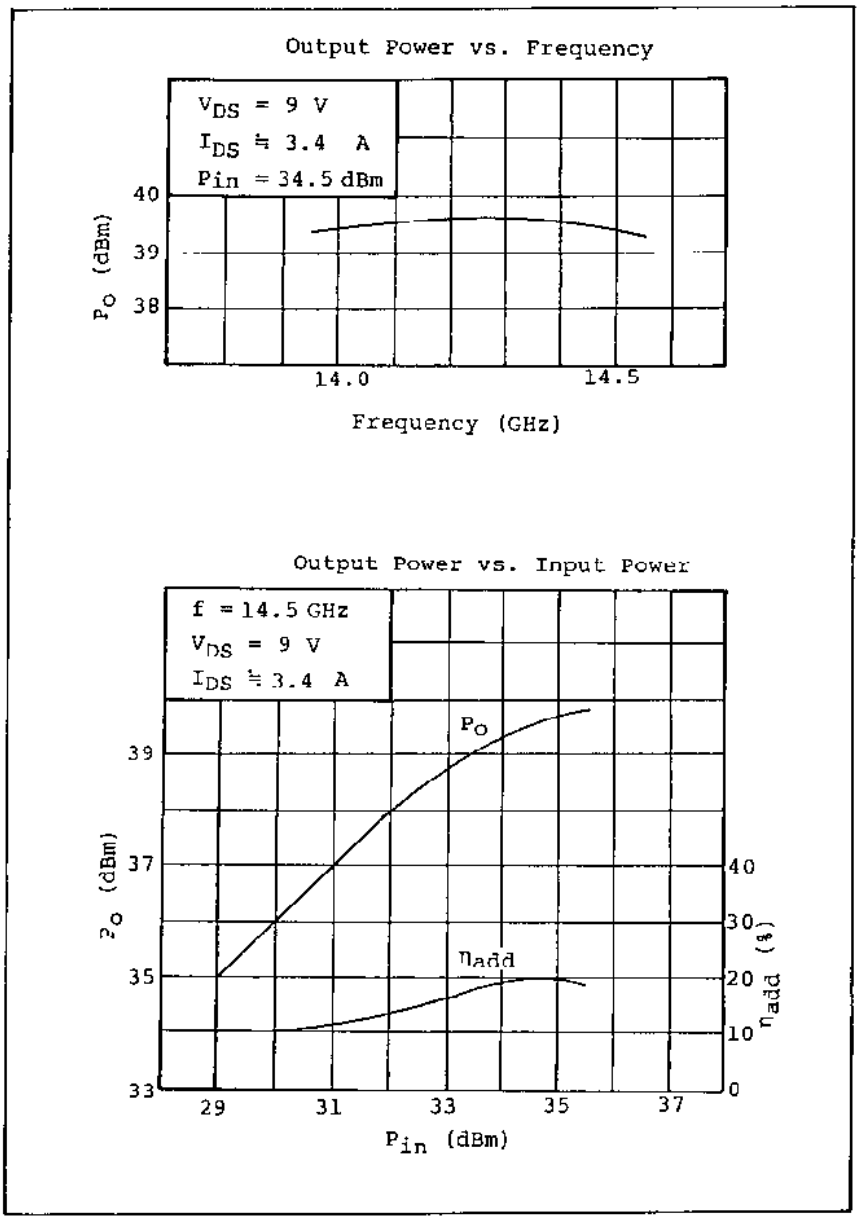
Package Outline (2-11C1B)



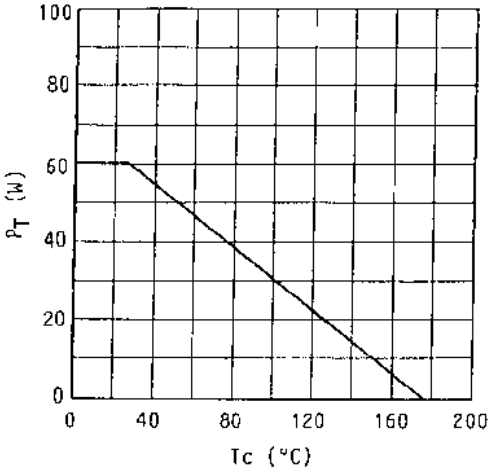
Handling Precautions for Packaged Type

Soldering iron should be grounded and the operating time should not exceed 10 seconds at 260°C.

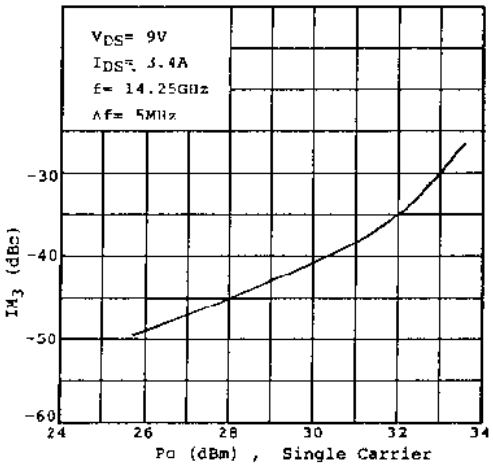
RF Performances



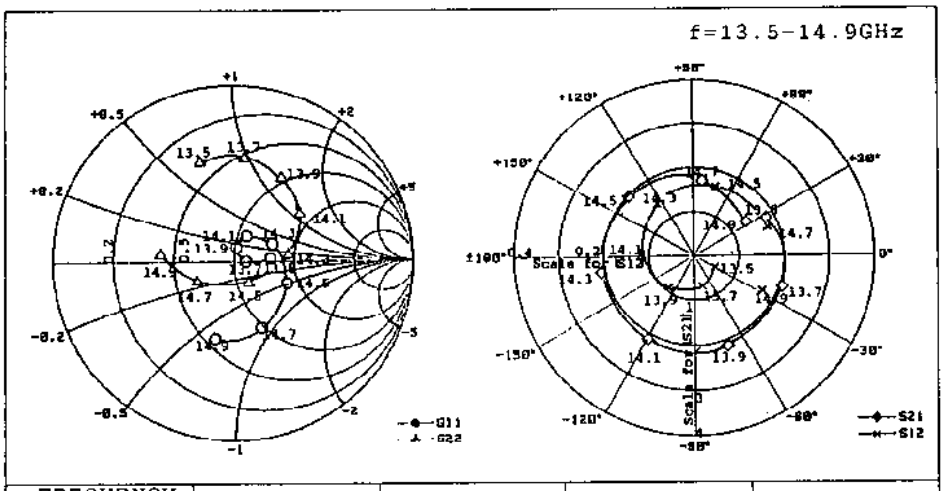
Power Dissipation vs. Case Temperature



IM_3 vs. Output Power Characteristics



TIM1414-8L S-Parameters
(MAGN. and ANGLES)



FREQUENCY (GHz)	S_{11}		S_{21}		S_{12}		S_{22}	
13.5	0.20	5	1.81	28	0.052	-29	0.59	108
13.7	0.07	2	2.06	-20	0.070	-77	0.59	84
13.9	0.08	81	2.13	-70	0.092	-130	0.54	60
14.1	0.16	64	2.13	-120	0.117	177	0.45	36
14.3	0.24	25	2.10	-170	0.143	125	0.30	7
14.5	0.32	-23	1.98	137	0.164	72	0.14	-57
14.7	0.40	-68	1.71	84	0.175	21	0.23	-152
14.9	0.45	-104	1.38	33	0.169	-28	0.41	175