

DESCRIPTION

The MGFK35VXXXX products are internally impedance matched devices for use in Ku-band power amplifier applications.

This family of devices use high performance source island via-hole GaAs die which offer excellent electrical and thermal resistance characteristics.

FEATURES

- Internally matched to 50Ω
- High output power
 $P_{1dB} = 3.5$ (TYP)
- High linear power gain
 $G_{LP} = 7.0$ dB (TYP) 12.2-12.8/12.7-13.2 GHz
 $G_{LP} = 6.5$ dB (TYP) 14.0-14.5 GHz
- High power added efficiency
 $\eta_{add} = 26\%$ (TYP) @ $f = 12.2-12.8/12.7-13.2$ GHz
 $\eta_{add} = 20\%$ (TYP) @ $f = 14.0-14.5$ GHz
- High linearity

FREQUENCY

TYPE NO.	FREQUENCY
MGFK35V2228	12.2 ~ 12.8 GHz
MGFK35V2732	12.7 ~ 13.2 GHz
MGFK35V4045	14.0 ~ 14.5 GHz

ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

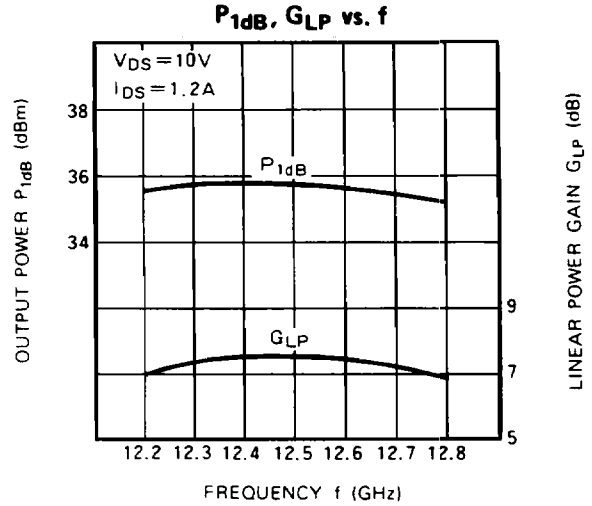
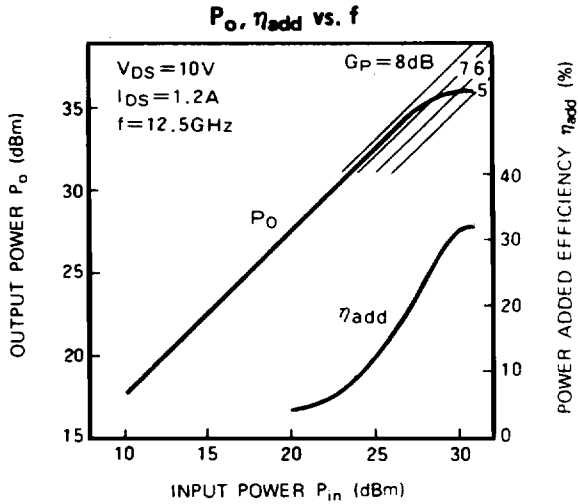
SYMBOL	PARAMETER	RATINGS	UNIT
V_{GDO}	Gate to drain voltage	-15	V
V_{GSO}	Gate to source voltage	-15	V
I_D	Drain current	2.8	A
I_{GR}	Reverse gate current	-9.0	mA
I_{GF}	Forward gate current	18.0	mA
P_T	Total power dissipation	27.2	W
T_{ch}	Channel temperature	175	$^\circ\text{C}$
T_{stg}	Storage temperature	-65 ~ +175	$^\circ\text{C}$
$R_{th(ch-c)}$	Thermal resistance	5.5	$^\circ\text{C/W}$

ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

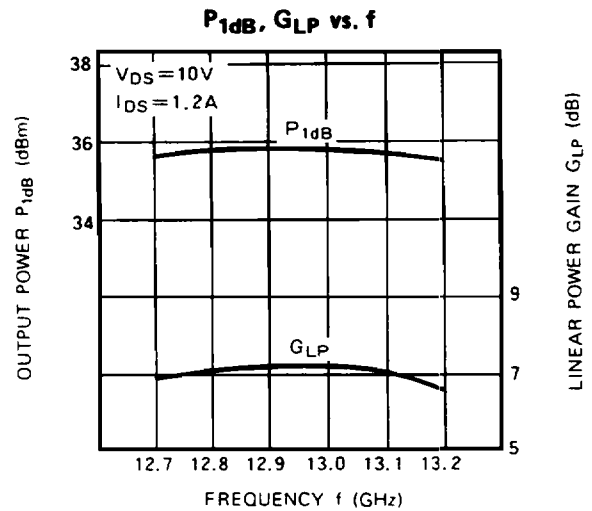
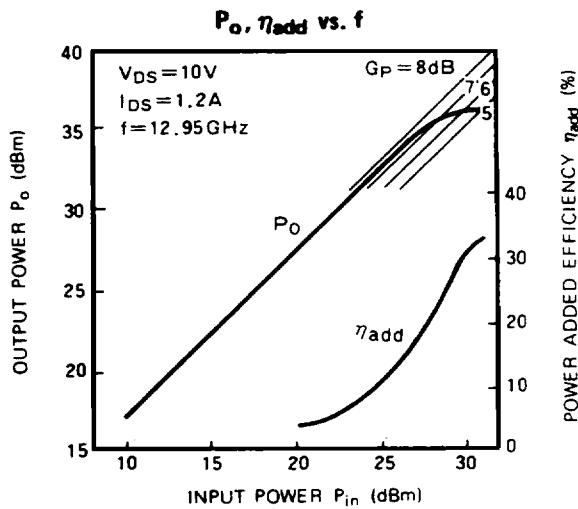
SYMBOL	PARAMETER	TEST CONDITIONS	TYPE	LIMITS			UNIT
				MIN	TYP	MAX	
I_{DSS}	Saturated drain current	$V_{DS} = 3V, V_{GS} = 0V$			2.0	2.8	A
g_m	Transconductance	$V_{DS} = 3V, V_{GS} = 0V-1V$			1.0		S
$V_{GS(off)}$	Gate to source cut-off voltage	$V_{DS} = 3V, I_D = 10mA$		-2	-3	-4	V
P_{1dB}	Output power at 1dB gain compression	$V_{DS} = 10V$ $I_D = 1.2A$		34.5	35.5		dBm
G_{LP}	Linear power gain		MGFK35V2228	6.0	7.0		dB
			MGFK35V2732	6.0	7.0		
			MGFK35V4045	5.5	6.5		
η_{add}	Power added efficiency		MGFK35V2228		26		%
			MGFK35V2732		26		
		MGFK35V4045		20			
R_g	Gate Resistance			100		Ω	

TYPICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

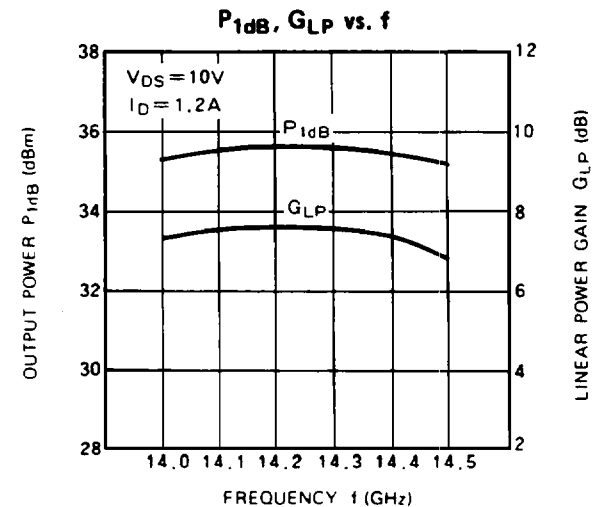
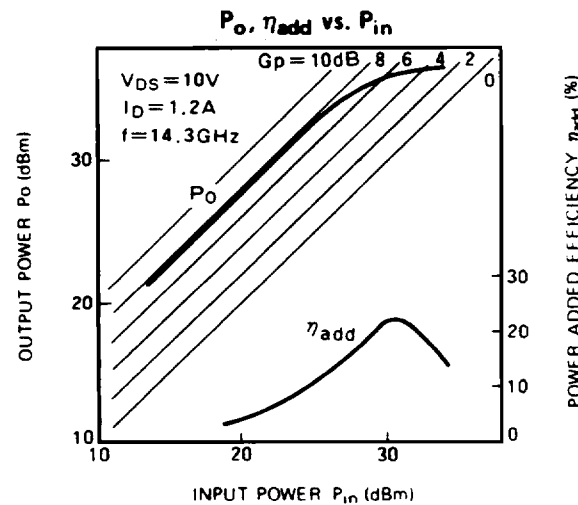
MGFK35V2228



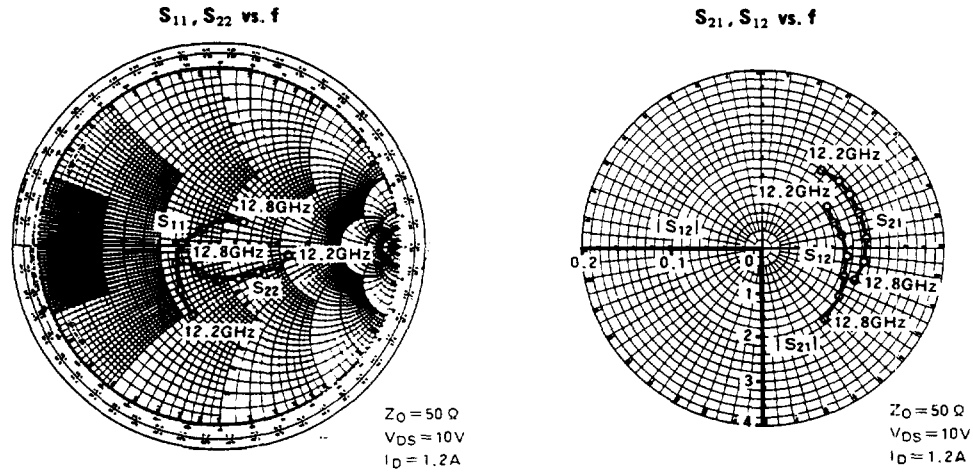
MGFK35V2732



MGFK35V4045



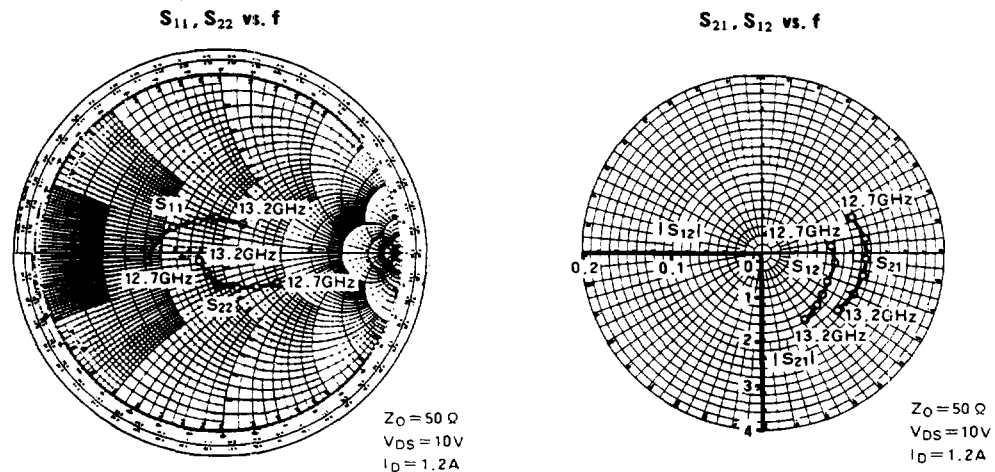
MGFK35V2228



S PARAMETERS ($T_a = 25^\circ\text{C}$, $V_{DS} = 10\text{V}$, $I_{DS} = 1.2\text{A}$)

f (GHz)	S-Parameters (TYP.)							
	S ₁₁		S ₁₂		S ₂₁		S ₂₂	
	Magn.	Angle (deg.)	Magn.	Angle (deg.)	Magn.	Angle (deg.)	Magn.	Angle (deg.)
12.2	0.413	-112	0.083	33	2.22	53	0.377	-8
12.3	0.345	-131	0.085	21	2.30	42	0.333	-20
12.4	0.267	-158	0.090	10	2.31	32	0.254	-36
12.5	0.222	178	0.093	-4	2.35	20	0.205	-61
12.6	0.149	134	0.099	-20	2.30	5	0.192	-95
12.7	0.152	89	0.102	-32	2.25	-7	0.195	-126
12.8	0.191	44	0.107	-49	2.17	-20	0.206	-156

MGFK35V2732

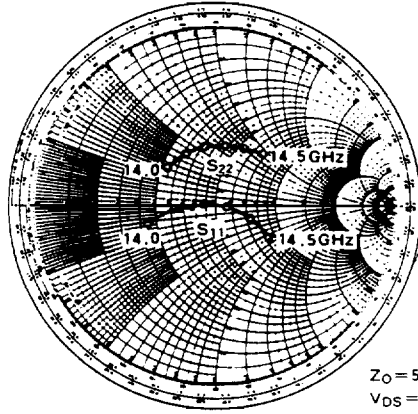


S PARAMETERS ($T_a = 25^\circ\text{C}$, $V_{DS} = 10\text{V}$, $I_{DS} = 1.2\text{A}$)

f (GHz)	S-Parameters (TYP.)							
	S ₁₁		S ₁₂		S ₂₁		S ₂₂	
	Magn.	Angle (deg.)	Magn.	Angle (deg.)	Magn.	Angle (deg.)	Magn.	Angle (deg.)
12.7	0.407	-171	0.074	7	2.18	22	0.340	-28
12.8	0.376	169	0.080	-8	2.28	8	0.258	-45
12.9	0.317	152	0.078	-24	2.27	-4	0.214	-65
13.0	0.232	129	0.080	-36	2.27	-13	0.178	-96
13.1	0.210	98	0.084	47	2.21	-25	0.147	-125
13.2	0.200	53	0.090	59	2.13	-38	0.139	-158

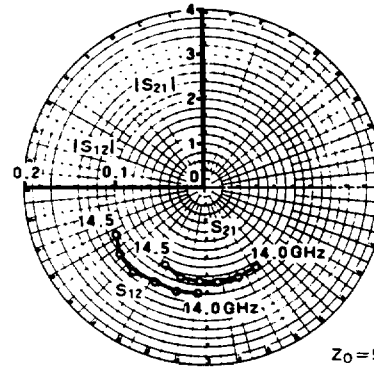
MGFK35V4045

S₁₁, S₂₂ vs. f



Z₀ = 50 Ω
V_{DS} = 10V
I_D = 1.2A

S₁₂, S₂₁ vs. f



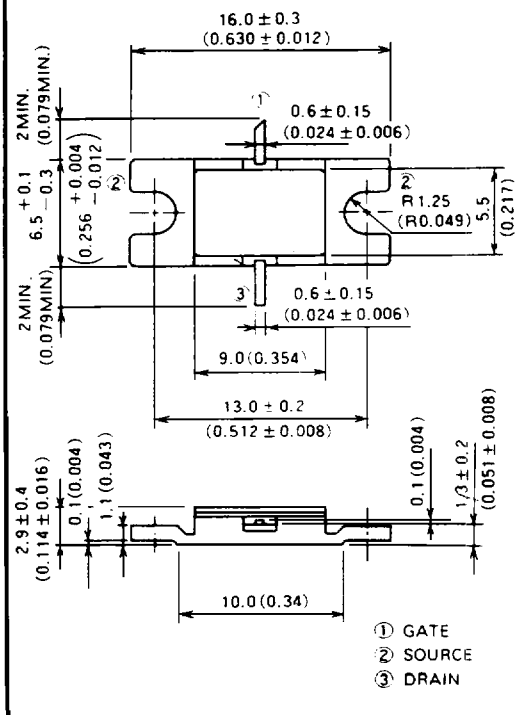
Z₀ = 50 Ω
V_{DS} = 10V
I_D = 1.2A

S PARAMETERS (T_a = 25°C, V_{DS} = 10V, I_D = 1.2A)

f (GHz)	S Parameters (TYP.)							
	S ₁₁		S ₁₂		S ₂₁		S ₂₂	
	Magn.	Angle (deg.)	Magn.	Angle (deg.)	Magn.	Angle (deg.)	Magn.	Angle (deg.)
14.0	0.391	-164	0.137	-94	2.089	-58	0.324	139
14.1	0.224	-173	0.139	-105	2.163	-70	0.322	117
14.2	0.091	176	0.141	-118	2.188	-82	0.331	98
14.3	0.052	-3	0.143	-130	2.163	-93	0.342	78
14.4	0.198	-22	0.140	-141	2.113	-105	0.362	62
14.5	0.337	-32	0.127	-152	1.995	-117	0.397	47

OUTLINE DRAWING

Unit: millimeters (inches)



ORDERING INFORMATION

Part Number	Grade	Tested at	P _{1dB}	IM ₃ Level
MGFK35V2228-01	Industrial	12.2 ~ 12.8 GHz	35 dBm	—
MGFK35V2228-51	Industrial	12.2 ~ 12.8 GHz	35 dBm	-40 dBc
MGFK35V2732-01	Industrial	12.7 ~ 13.2 GHz	35 dBm	—
MGFK35V2732-51	Industrial	12.7 ~ 13.2 GHz	35 dBm	-40 dBc
MGFK35V4045-01	Industrial	14.0 ~ 14.5 GHz	35 dBm	—
MGFK35V4045-51	Industrial	14.0 ~ 14.5 GHz	35 dBm	-40 dBc