2SK3174A

Silicon N Channel MOS FET
UHF Power Amplifier

HITACHI

ADE-208-1451 (Z)

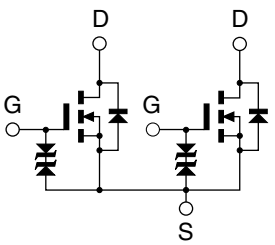
1st. Edition
September 2001

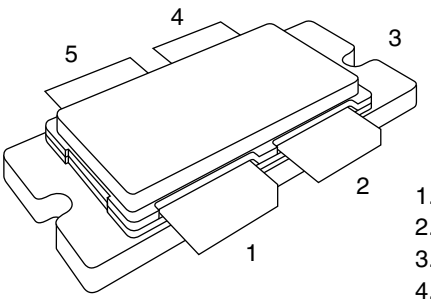
Features

- High power output, High gain, High efficiency
  P_{1dB} = 220 W , PG = 15.3dB , ηD = 61 % (at P_{1dB}) typ. (f = 860MHz)
- Compact package
  Suitable for push - pull circuit

Outline

RFPAK-F





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

This Device is sensitive to Electro Static Discharge. An Adequate handling procedure is requested.
In AC testing, the part should be mounted on heat sink with thermal compound.

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Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS} Note1	60	V
Gate to source voltage	V_{GSS}	±10	V
Drain current	I_D	16	A
Drain peak current	$I_{D(pulse)}$ Note2	32	A
Channel dissipation	Pch Note3	252	W
Channel temperature	Tch	175	°C
Storage temperature	Tstg	–55 to +150	°C

Note: 1. Pin=0, PW ≤ 0.1sec
2. PW ≤ 10ms, duty cycle ≤ 50 %
3. Value at Tc = 25°C

Electrical Characteristics

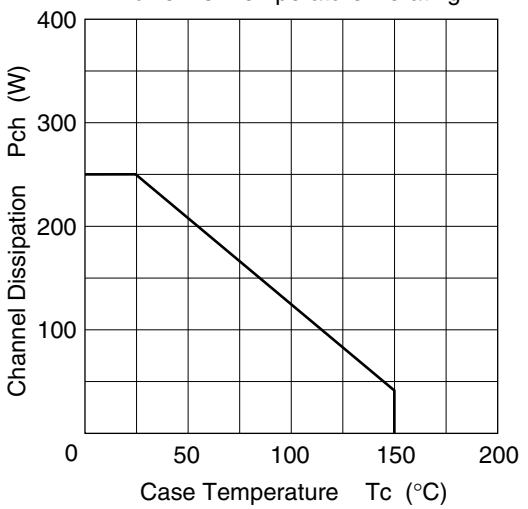
(Tc = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Zero gate voltage drain current Note4	I_{DSS}	—	—	1	mA	V_{DS} = 60 V, V_{GS} = 0
Gate to source leak current Note4	I_{GSS}	—	—	±3	µA	V_{GS} = ±10 V, V_{DS} = 0
Gate to source cutoff voltage Note4	$V_{GS(off)}$	1.0	2.3	3.0	V	I_D = 1 mA, V_{DS} = 10 V
Forward transfer admittance Note4 5	$\|y_{fs}\|$	4.0	6.7	—	S	V_{DS}=10 V, I_D = 5 A Note5
Input capacitance Note4	Ciss	—	162	—	pF	V_{GS} = 5 V, V_{DS} = 0 f = 1 MHz
Reverse transfer capacitance Note4	Crss	—	4	—	pF	V_{DG} = 10 V, V_{GS} = 0 f = 1 MHz
Output Power	Pout	200	270	—	W	V_{DS} = 28 V, I_{DQ} = 1.2 A f = 860 MHz Pin = 14 W
Drain Rational	ηD	—	64	—	%	V_{DS} = 28 V, I_{DQ} = 1.2 A f = 860 MHz Pin = 14 W

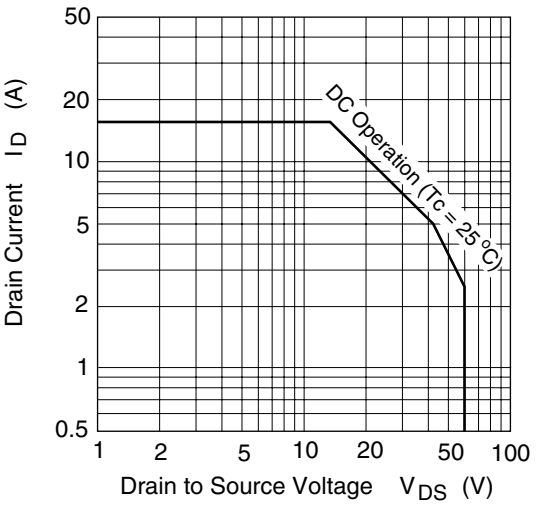
Note: 4. Shows 1 unit FET
5. Pulse Test

Main Characteristics

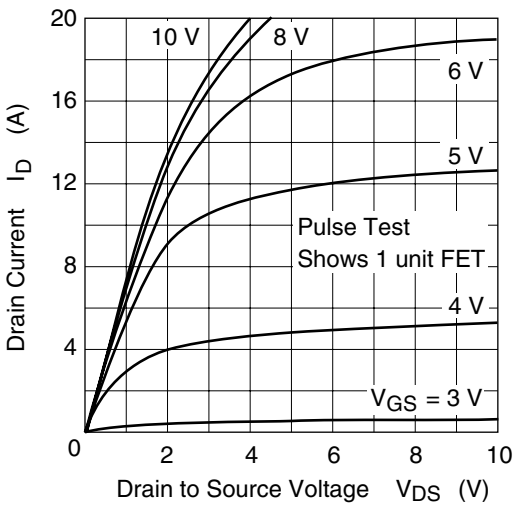
Power vs. Temperature Derating



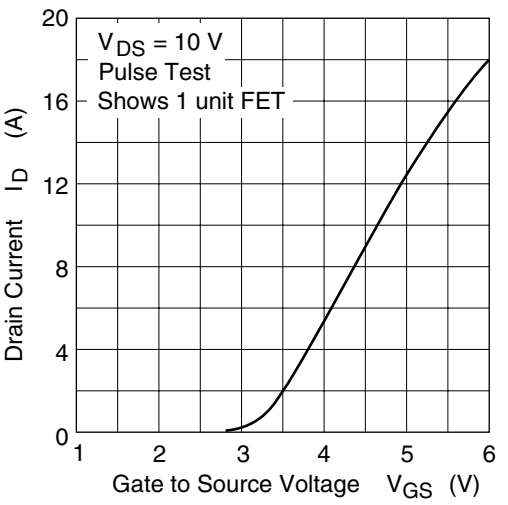
Maximum Safe Operation Area



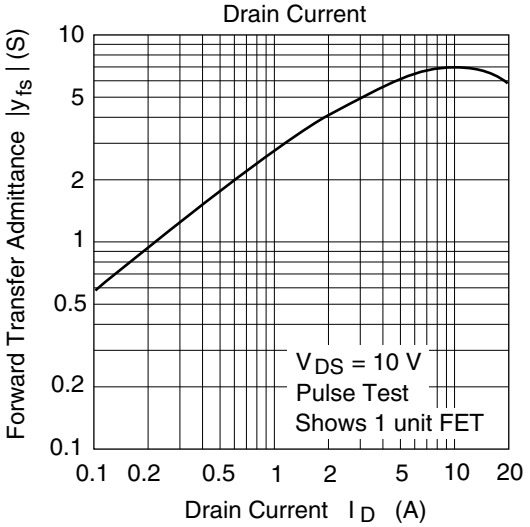
Typical Output Characteristics



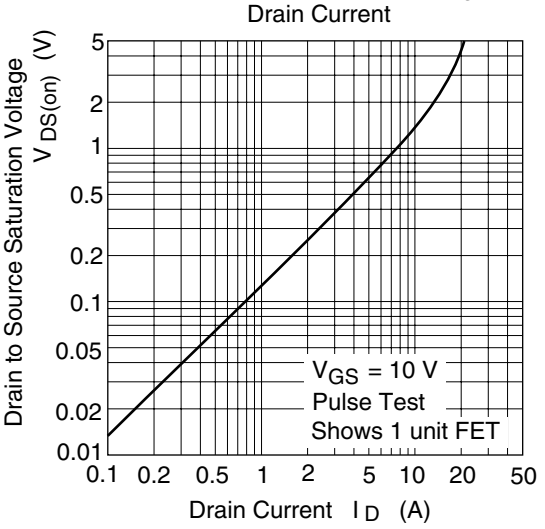
Typical Transfer Characteristics



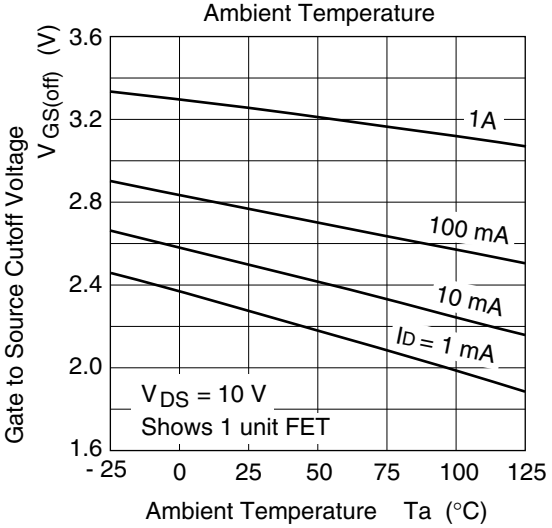
Forward Transfer Admittance vs. Drain Current



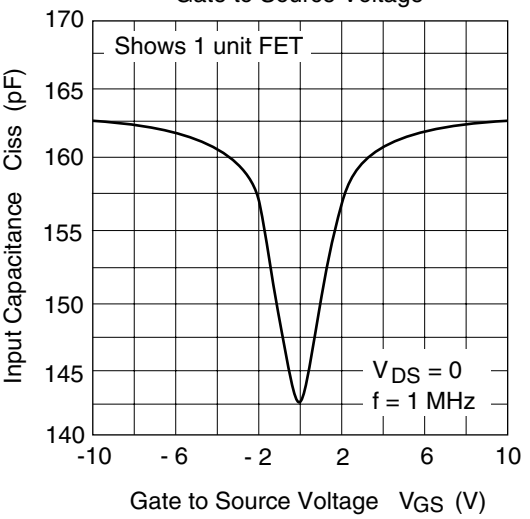
Drain to Source Saturatioin Voltage vs. Drain Current



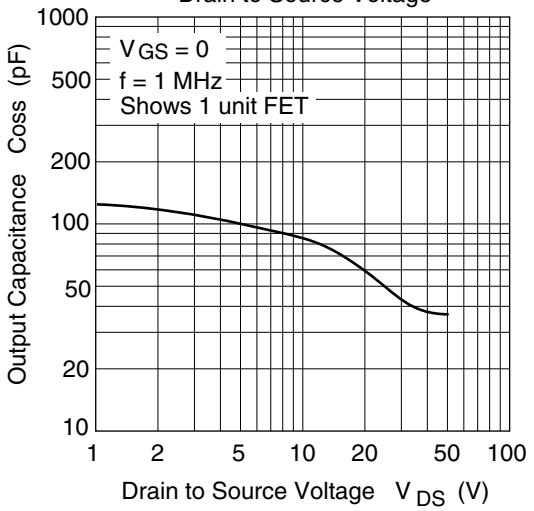
Gate to Source Cutoff Voltage vs. Ambient Temperature



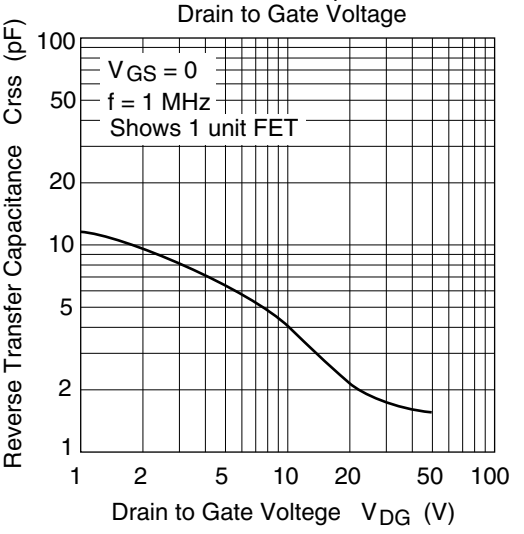
Input Capacitance vs. Gate to Source Voltage



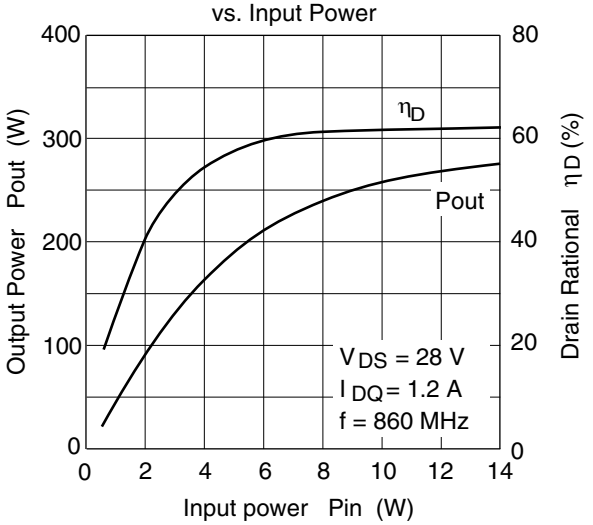
Output Capacitance vs.
Drain to Source Voltage



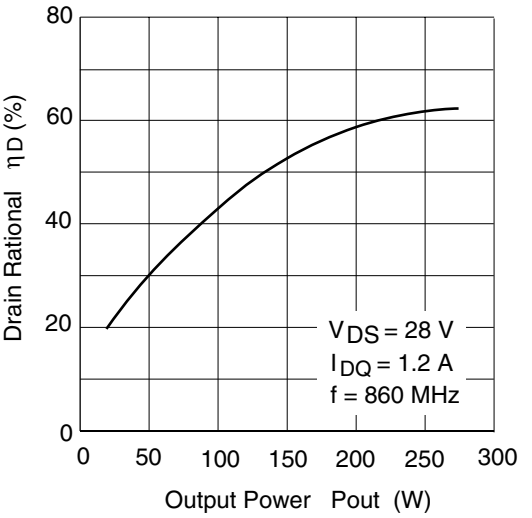
Reverse Transfer Capacitance vs.
Drain to Gate Voltage

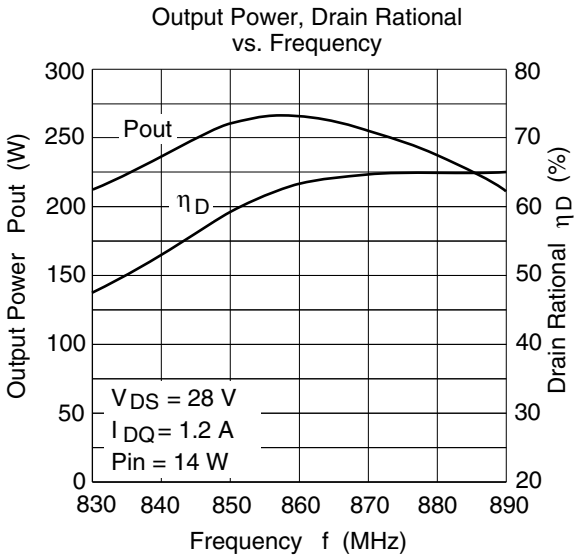


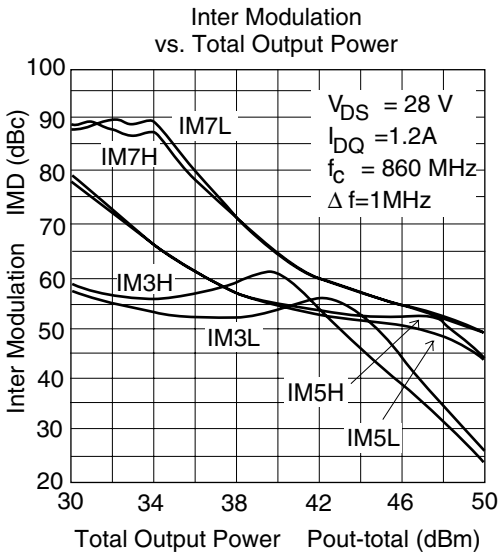
Output Power, Drain Rational
vs. Input Power



Drain Rational vs. Output Power



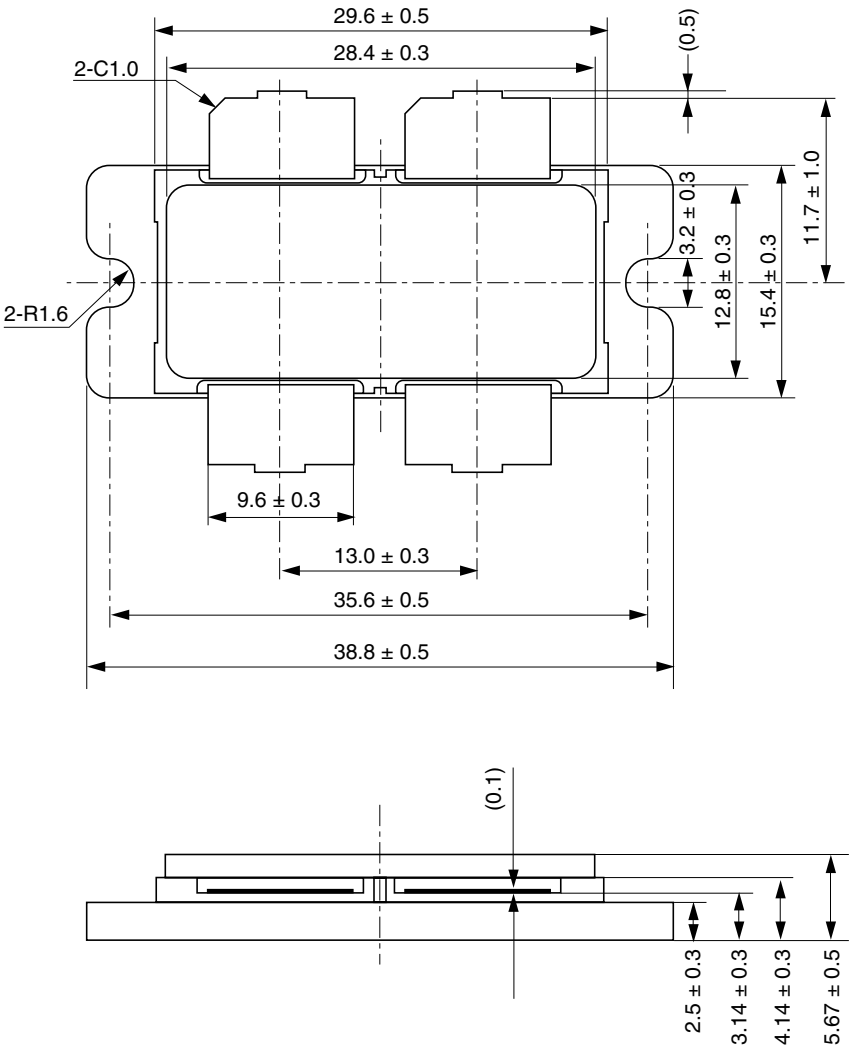

Output Power, Drain Rational
vs. Frequency
Output Power Pout (W)
Drain Rational ηD (%)
Frequency f (MHz)
Pout
ηD
VDS = 28 V
IDQ = 1.2 A
Pin = 14 W
300
250
200
150
100
50
0
80
70
60
50
40
30
20
830
840
850
860
870
880
890


Inter Modulation
vs. Total Output Power
Inter Modulation IMD (dBc)
Total Output Power Pout-total (dBm)
VDS = 28 V
IDQ =1.2A
fc = 860 MHz
Δ f=1MHz
IM7L
IM7H
IM3H
IM3L
IM5H
IM5L
100
90
80
70
60
50
40
30
20
30
34
38
42
46
50

Package Dimensions

As of July, 2001

Unit: mm



Hitachi Code	RFPAK-F
JEDEC	–
JEITA	–
Mass (reference value)	17.2 g

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