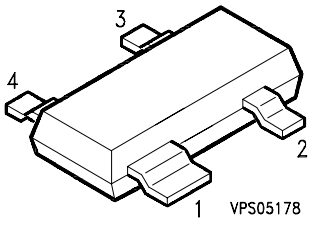
D a t a s h e e t

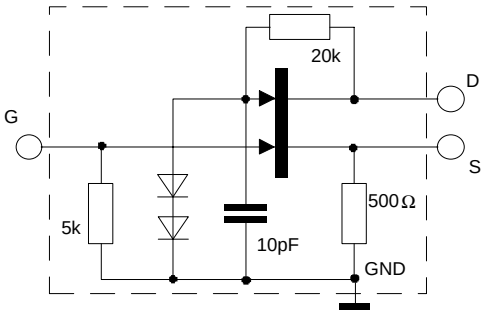
- ***** Biased Dual Gate GaAs FET
- ***** For frequencies from 400 MHz to 3 GHz
- ***** Mixer and amplifier applications in handheld equipment
- ***** Low power consumption, 2mA operating current typ.
- ***** Operating voltage range: 3 to 6V
- ***** Ion-implanted planar structure

ESD: **E**lectro**s**tatic **d**ischarge sensitive device, observe handling precautions!



Type	Marking	Ordering code (taped)	Pin Configuration 1	2	3	4	Package 1)
CF 750	MX	Q62702-F1391	GND	D	G	S	SOT 143

Circuit diagram:



Maximum ratings	Symbol		Unit
Drain-source voltage	V_{DS}	8	V
Gate-source voltage	$-V_{GS}$	5	V
Drain current	I_D	80	mA
Gate-source peak current	$+I_{GSM}$	2	mA
Channel temperature	T_{Ch}	150	°C
Storage temperature range	T_{stg}	-55 ... +150	°C
Total power dissipat. (T_S<48°C) 2)	P_{tot}	300	mW
Thermal resistance			
Channel-soldering point (GND)	$R_{thChGND}$	340	K/W

1) For detailed dimensions see chapter Package Outlines

2) T_S: Temperature measured at soldering point

Electrical characteristics T_A = 25°C, unless otherwise specified

DC characteristics	Symbol	min	typ	max	Unit
Drain-Source Breakdown Voltage I_D = 500 µA, $-V_{GS}$=4V	$V_{DS(BR)}$	8	-	-	V
Drain Current V_{GGND}= 0V, V_{DS}= 3.8 V S-pin not connected	$I_{DSS,P}$	1.6	2	2.8	mA
Drain Current V_{GS}= 0V, V_{DS}= 3.8 V S-pin connected to GND	I_{DSS}	-	50	-	mA
Transconductance I_D = 10 mA, V_{DS} = 3.8 V S-pin connected to GND	g_m	-	25	-	mS

Electrical characteristics of CF 750 in Amplifier Application

T_A = 25 °C, V_{DGND} = 3.8V, R_S = R_L = 50 Ω, unless otherwise specified

Amplifier Application	Symbol	min	typ	max	Unit
Power Gain I_D = 2 mA, f = 900 MHz	G_{PS}	-	11	-	dB
Noise Figure I_D = 2 mA, f = 900 MHz	F	-	1.6	-	dB
3rd Order Intermodulation I_D = 2 mA, f = 900 MHz	$IPIP3$	-	-1	-	dBm
3rd Order Intermodulation I_D = 2 mA, f = 900 MHz	$OPIP3$	-	10	-	dBm
Power Gain I_D = 2 mA, f = 1.8 GHz	G_{PS}	-	10	-	dB
Noise Figure I_D = 2 mA, f = 1.8 GHz	F	-	1.9	-	dB
3rd Order Intermodulation I_D = 2 mA, f = 1.8 GHz	$IPIP3$	-	-1	-	dBm
3rd Order Intermodulation I_D = 2 mA, f = 1.8 GHz	OPIP3	-	9	-	dBm

Electrical characteristics of CF 750 in Mixer Application

T_A = 25 °C, V_{DGND} = 3.8V, R_S = R_L = 50 Ω, unless otherwise specified

Mixer Application	Symbol	min	typ	max	Unit
Single Sideband Noise Figure f_{RF} = 945 MHz, f_{LO} = 900 MHz f_{IF} = 45 MHz, P_{LO} = 3 dBm	F_{SSB}	-	4.5	-	dB
Conversion Gain f_{RF} = 945 MHz, f_{LO} = 900 MHz f_{IF} = 45 MHz, P_{LO} = 3 dBm	G_a	-	15	-	dB
3rd Order Intermodulation f_{RF} = 945 MHz, f_{LO} = 900 MHz f_{IF} = 45 MHz, P_{LO} = 3 dBm	*IPIP3*	-	-5	-	dBm
3rd Order Intermodulation f_{RF} = 945 MHz, f_{LO} = 900 MHz f_{IF} = 45 MHz, P_{LO} = 3 dBm	*OPIP3*	-	10	-	dBm

Typical Common Source S-Parameters

Bias conditions: V_{DGND}= 3.8 V, I_D = 2 mA
Source-Pad RF-grounded by capacitor with low inductance (< 0.5nH) !

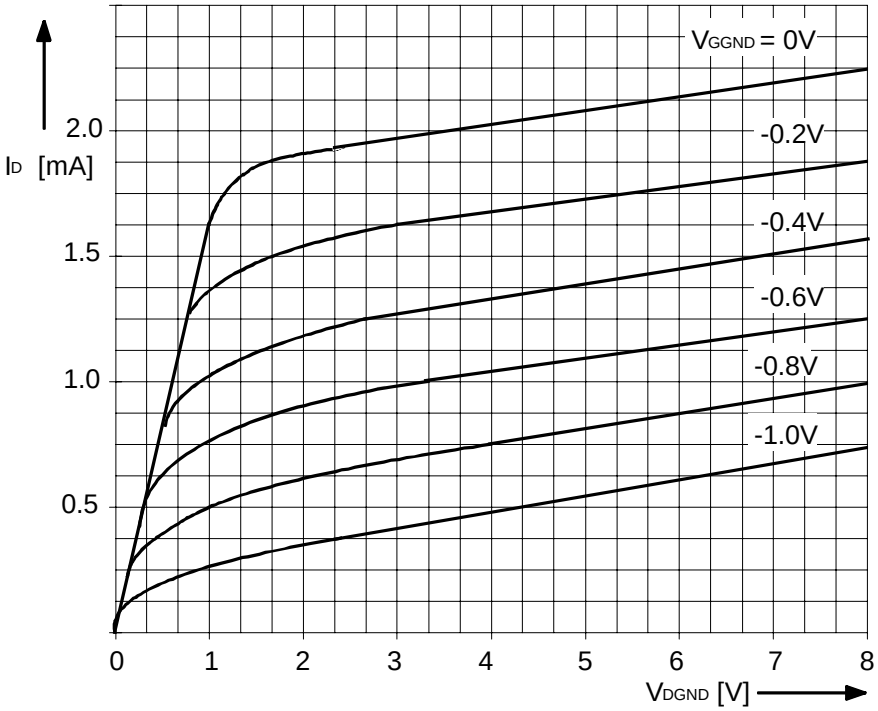
f	S11		S21		S12		S22	
GHz	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
0.01	0.97	-1	1.78	179	0.002	89	0.98	-1
0.1	0.97	-3	1.78	175	0.008	84	0.98	-2
0.25	0.96	-8	1.76	169	0.015	78	0.97	-6
0.5	0.94	-16	1.73	155	0.027	75	0.95	-11
0.75	0.91	-26	1.70	141	0.039	71	0.93	-16
1.00	0.87	-34	1.68	127	0.046	64	0.91	-22
1.25	0.83	-42	1.65	118	0.052	62	0.89	-26
1.5	0.87	-49	1.62	108	0.061	57	0.88	-30
1.75	0.72	-57	1.59	95	0.066	55	0.87	-34
2.00	0.66	-65	1.54	82	0.069	52	0.86	-38
2.25	0.61	-73	1.51	71	0.071	54	0.85	-43
2.5	0.56	-81	1.47	60	0.073	60	0.84	-48
2.75	0.52	-87	1.45	52	0.074	63	0.83	-52
3.00	0.49	-93	1.42	45	0.075	66	0.82	-56

Typical Common Source Noise Parameters

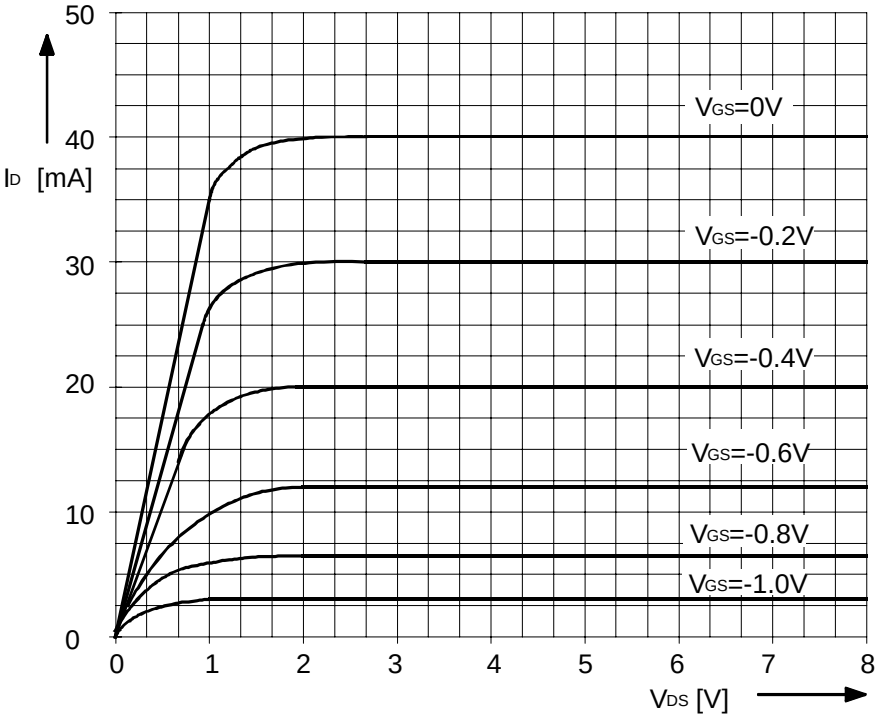
Bias conditions: V_D= 3 V, I_D= 2 mA, Z = 50Ω

f	Γ_{opt} (F)		Rn	Rn/50Ω	F min
MHz	MAG	ANG	Ω	-	dB
200	0.80	5	75	1.50	1.2
450	0.79	12	60	1.20	1.2
800	0.68	23	51	1.02	1.5
900	0.63	26	49	0.98	1.6
1200	0.58	34	45	0.90	1.7
1500	0.54	42	40	0.80	1.8
1800	0.52	51	36	0.72	1.9
1900	0.50	53	35	0.70	1.9

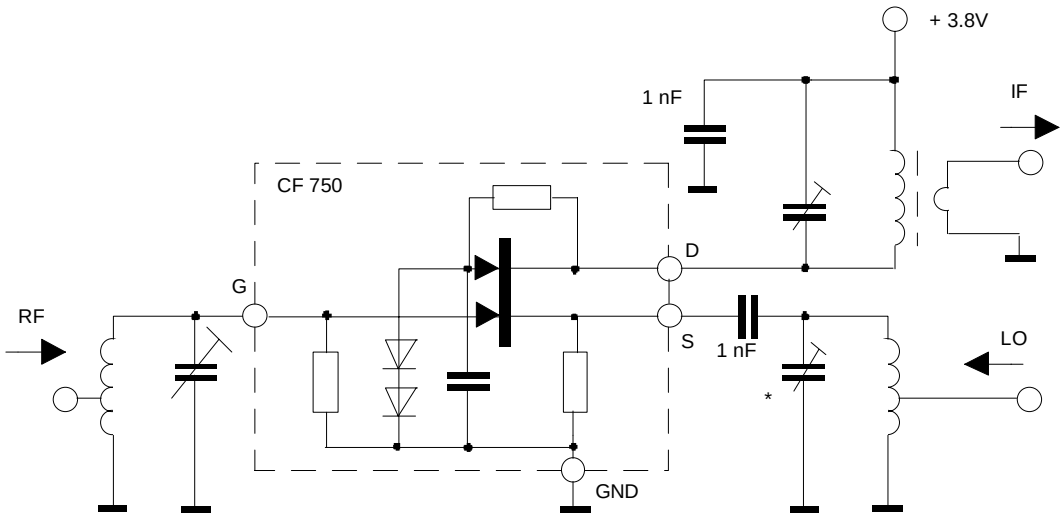
Output characteristics $I_D = f(V_{DGND})$ at nominal operating point; S not connected.



Output characteristics $I_D = f(V_{DS})$, S connected to GND.



Mixer measurement and application circuit (No. 1)



* must be high capacitance to ensure good IF grounding at source

Amplifier measurement and application circuit (No. 2)