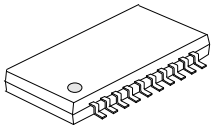
L8211

LINEAR INTEGRATED CIRCUIT

FET BIAS CONTROLLER WITH POLARIZATION SWITCH AND TONE DETECTION



SSOP-20(150mil)

■ DESCRIPTION

The UTC **L8211** is designed to bias the MOSFETs that are commonly used in LNBs that can implies minimum external components requires.

■ FEATURES

* Three outputs that can drive up to 3 FETs.
* Drain current adjustable by external resistor.
* HB and LB switch for LNBs.
* Band switching by 22kHz tone detection.

■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
L8211L-R20-R	L8211G-R20-R	SSOP-20	Tape Reel
L8211L-R20-T	L8211G-R20-T	SSOP-20	Tube

L8211L-R20-R

(1)Packing Type

(2)Package Type

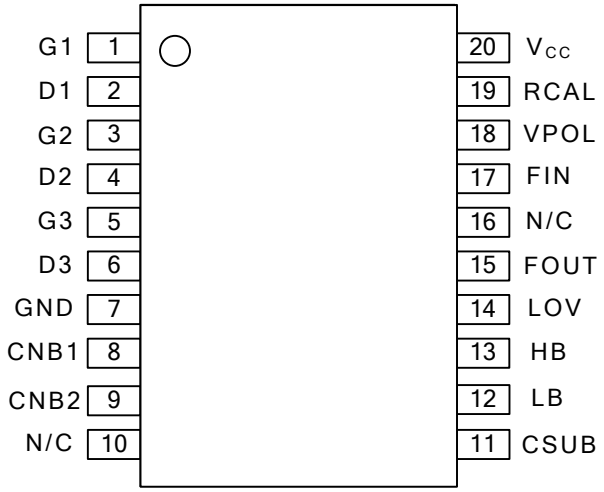
(3)Lead Plating

(1) R: Tape Reel

(2) R20: SSOP-20

(3) L: Lead Free, G: Halogen Free

■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	G1	To Gate of FET 1
2	D1	To Drain of FET 1
3	G2	To Gate of FET 2
4	D2	To Drain of FET 2
5	G3	To Gate of FET 3
6	D3	To Drain of FET 3
7	GND	Ground
8	CNB1	Connect 47nF capacitance to CNB2
9	CNB2	Connect 47nF capacitance to CNB1
10, 16	N/C	Nothing connect
11	CSUB	Connect an external 47nF cap to -3V
12	LB	Low band switch output
13	HB	High band switch output
14	LOV	LB and HB's switch
15	FOUT	Filter output
17	FIN	LNB input
18	VPOL	Control input switch
19	RCAL	Connect 33kohm to set Id1, Id2 and Id3 to 10mA
20	V_{CC}	Power supply

■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	-0.6 ~ +12	V
Supply Current	I_{CC}	100	mA
Input Voltage	V_{IN}	25 Continuous	V
Drain Current (per FET)(set by R_{CAL})	I_D	0 ~ 15	mA
Power Dissipation(Ta=25°C)	P_D	600	mW
Operating Temperature	T_{OPR}	-40~+70	°C
Storage Temperature	T_{STG}	-50~+85	°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ ELECTRICAL CHARACTERISTICS

(T_a=25°C, V_{CC}=5V, I_D=10mA, R_{CAL}=33KΩ, unless otherwise specified.)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage		V_{CC}		5		10	V
Supply Current		I_{CC}	I_{D1} to I_{D3}=0		6	15	mA
			I_{D1} =0, I_{D2} to I_{D3}=10mA,V_{POL}=14V		25	35	mA
			I_{D2}=0, I_{D1} to I_{D3}=10mA,V_{POL}=15.5V		25	35	mA
			I_{D1} to I_{D3}=0,I_{LB}=10mA		16	25	mA
			I_{D1} to I_{D3}=0,I_{HB}=10mA		16	25	mA
Substrate Voltage		V_{SUB}	(Internally generated) I_{SUB} =0	-3.5	-3	-2.5	V
			I_{SUB} = -200μA			-2.4	V
Output Noise	Gate Voltage	E_{NG}	C_G=4.7nF,C_D=10nF			0.005	Vpkpk
	Drain Voltage	E_{ND}	C_G=4.7nF,C_D=10nF			0.02	Vpkpk
Oscillator Freq		f_O		200	350	800	kHz

■ GATE CHARACTERISTICS

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Current Range		I_{GO}		-30		2000	μA
Output Voltage Gate 1	Off	V_{G1O}	I_{D1}=0mA, V_{POL}=14V, I_{GO1}=0μA	-0.05	0	0.05	V
	Low	V_{G1L}	I_{D1}=12mA, V_{POL}=15.5V, I_{GO1}=-10μA	-2.7	-2.4	-2	V
	High	V_{G1H}	I_{D1}=8mA, V_{POL}=15.5V, I_{GO1}=0μA	0.4	0.75	1.0	V
Output Voltage Gate 2	Off	V_{G2O}	I_{D2}=0mA, V_{POL}=15.5V, I_{GO2}=0μA	-0.05	0	0.05	V
	Low	V_{G2L}	I_{D2}=12mA, V_{POL}=14V, I_{GO2}=-10μA	-2.7	-2.4	-2	
	High	V_{G2H}	I_{D2}=8mA, V_{POL}=14V, I_{GO2}=0μA	0.4	0.75	1.0	
Output Voltage Gate 3	Low	V_{G3L}	I_{D3}=12mA, I_{GO3}=-10μA	-3.5	-2.9	-2	V
	High	V_{G3H}	I_{D3}=8mA, I_{GO3}=0μA	0.4	0.75	1.0	

■ DRAIN CHARACTERISTICS

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Current		I_D		8	10	12	mA
Current Change	With V_{CC}	$\triangle I_{DV}$	V_{CC}=5 ~ 10V		0.5		%/V
	With T_J	$\triangle I_{DT}$	T_J =-40 ~ +70°C		0.05		%/°C
Drain 1 Voltage: High		V_{D1}	I_{D1}=10mA,V_{POL}=15.5V	1.8	2	2.2	V
Drain 2 Voltage: High		V_{D2}	I_{D2}=10mA,V_{POL}=14V	1.8	2	2.2	V
Drain 3 Voltage: High		V_{D3}	I_{D3}=10mA	1.8	2	2.2	V
Voltage Change	With V_{CC}	$\triangle V_{DV}$	V_{CC} =5 ~ 10V		0.5		%/V
	With T_J	$\triangle V_{DT}$	T_J =-40 ~ +70°C		50		ppm
Leakage Current	Drain 1	I_{LEAK1}	V_{D1}=0.5V,V_{POL}=14V			10	μA
	Drain 2	I_{LEAK2}	V_{D2}=0.5V,V_{POL}=15.5V			10	μA

■ TONE DETECTION CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Filter Amplifier							
Input Bias Current	I_B	R_{F1}=150kΩ		0.02	0.07	0.25	μA
Output Voltage	V_{OUT}	R_{F1}=150kΩ		1.75	1.95	2.05	V
Output Current	I_{OUT}	V_{OUT}=1.96V, V_{FIN}=2.1V		400	520	650	μA
Voltage Gain	Gv	f=22kHz, V_{IN}=1mV			46		dB
Rejection Frequency	f_R	$V_{(AC)IN}$=1V p/p sq.w		1.0	7.5		kHz
V Threshold	F_{VT}			100		350	mV p/p
Output Stage							
Lov Volt.Range	V_{LOV}	I_L=50mA(LB or HB)		-0.5		V_{CC}-1.8	V
Lov Bias Current	I_{LOV}	V_{LOV}=0V		0.02	0.15	1	μA
LB Output Low	V_{LBL}	V_{LOV}=0V, I_L=-10μA	Enable	-3.5	-2.75	-2.5	V
		V_{LOV}=3V, I_L=0mA	Enable	-0.01	0	0.01	V
LB Output High	V_{LBH}	V_{LOV}=0V, I_L=10 mA	Disable	-0.025	0	0.025	V
		V_{LOV}=3V, I_L=50mA	Disable	2.9	3	3.1	V
HB Output Low	V_{HBL}	V_{LOV}=0V, I_L=-10μA	Disable	-3.5	-2.75	-2.5	V
		V_{LOV}=3V, I_L=0mA	Disable	-0.01	0	0.01	V
HB Output High	V_{HBH}	V_{LOV}=0V, I_L=10mA	Enable	-0.025	0	0.025	V
		V_{LOV}=3V, I_L=50mA	Enable	2.9	3	3.1	V

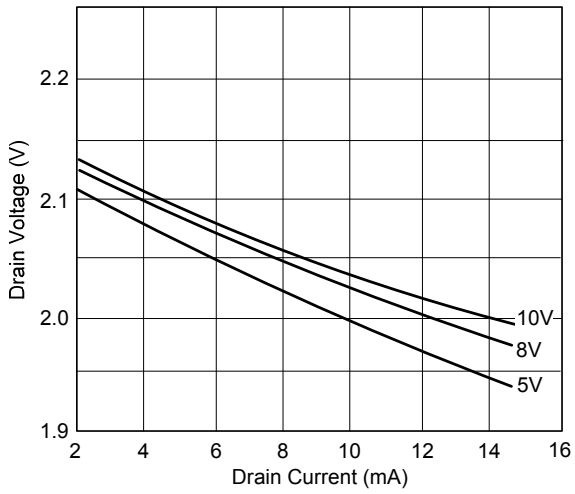
Note: Noise voltage measurement would be ignored in production.

■ POLARITY SWITCH CHARACTERISTICS

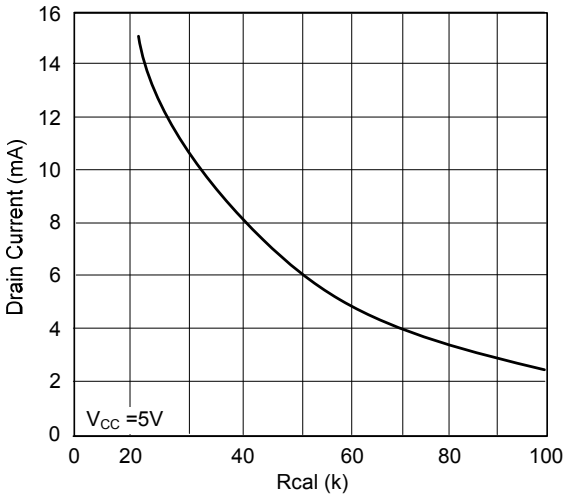
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Current	I_{POL}	V_{POL}=25V (Applied via R_{POL}=10kΩ)	10	20	40	μA
Threshold Voltage	V_{TPOL}	V_{POL}=25V (Applied via R_{POL}=10kΩ)	14	14.75	15.5	V
Switching Speed	T_{SPOL}	V_{POL}=25V (Applied via R_{POL}=10kΩ)			100	ms

■ TYPICAL CHARACTERISTICS

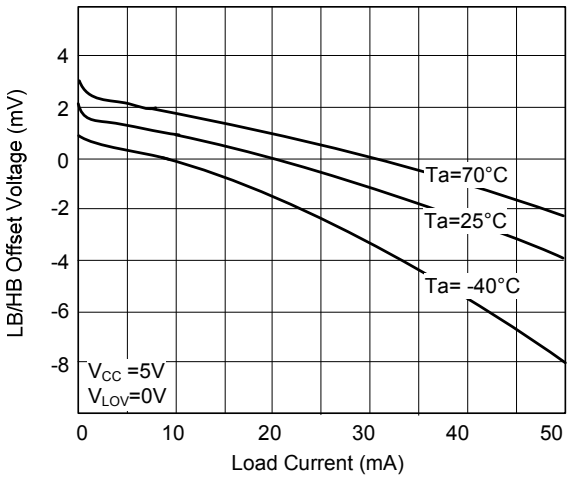
JFET Drain Voltage vs Drain Current



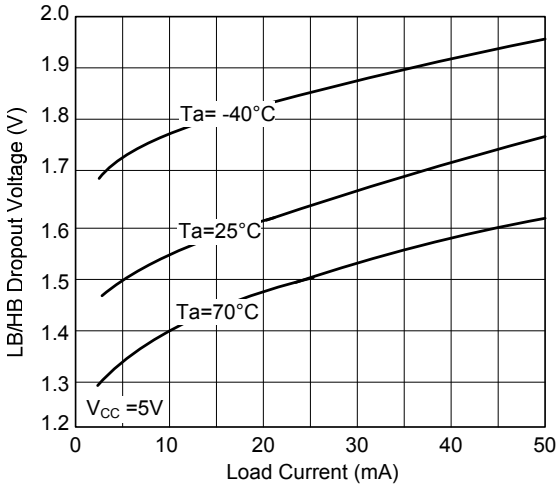
JFET Drain Current vs Rcal



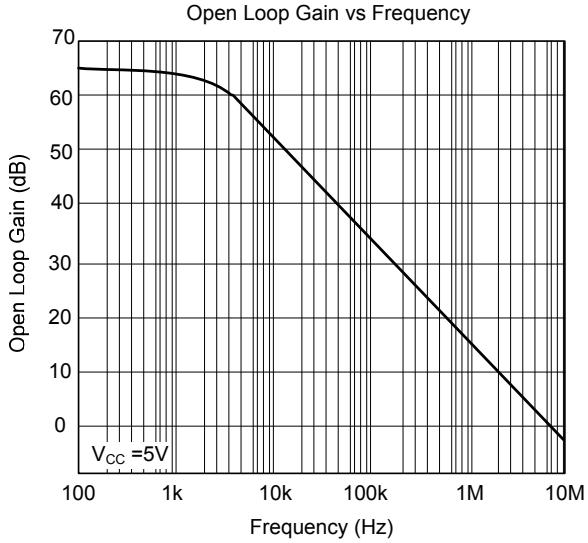
LB/HB Offset Voltage vs Load Current



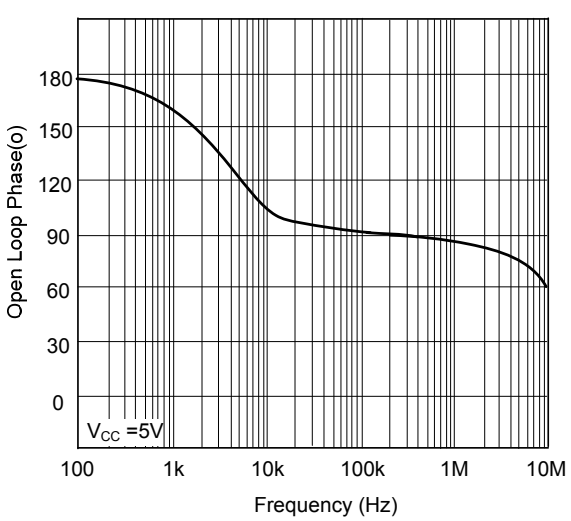
LB/HB Dropout Voltage vs Load Current



Open Loop Gain vs Frequency



Open Loop Phase vs Frequency



■ TYPICAL CHARACTERISTICS(Cont.)