



## TF5123

JFET

### N-CHANNEL JUNCTION FIELD EFFECT TRANSISTOR

#### DESCRIPTION

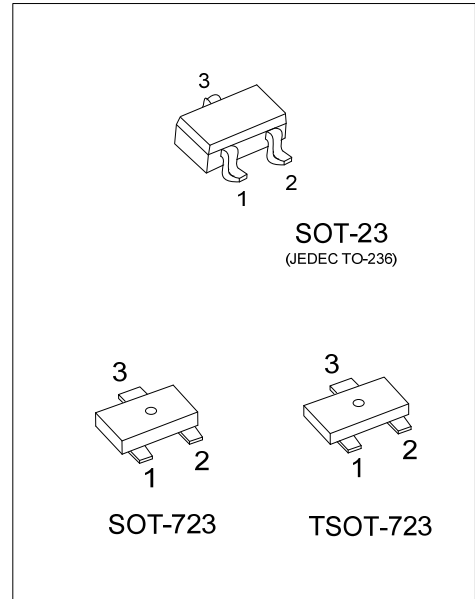
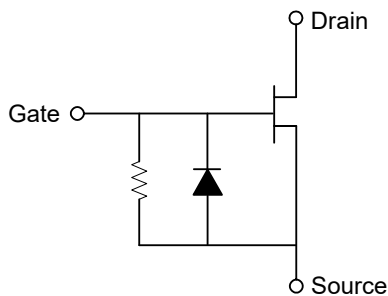
The UTC **TF5123** is an N-Channel Junction FET, it uses UTC's advanced technology to provide the customers with high voltage gain, etc.

The UTC **TF5123** is suitable for electret capacitor microphone applications.

#### FEATURES

- \* High voltage gain
- \* For electret capacitor microphone

#### EQUIVALENT CIRCUIT



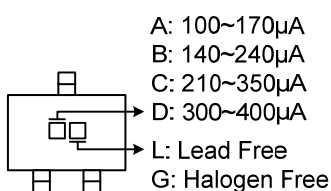
#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
TF5123L-xx-AE3-R	TF5123G-xx-AE3-R	SOT-23	D	S	G	Tape Reel
TF5123L-xx-AH7-R	TF5123G-xx-AH7-R	TSOT-723	D	S	G	Tape Reel
TF5123L-xx-AQ3-R	TF5123G-xx-AQ3-R	SOT-723	D	S	G	Tape Reel

Note: Pin Assignment: D: Drain S: Source G: Gate

<b>TF5123G-xx-AE3-R</b>		(1)Packing Type	(1) R: Tape Reel
		(2)Package Type	(2) AE3: SOT-23, AH7: TSOT-723, AQ3: SOT-723
		(3)Rank	(3) x: refer to CLASSIFICATION OF $I_{DSS}$
		(4)Green Package	(4) G: Halogen Free and Lead Free, L: Lead Free

#### MARKING



■ ABSOLUTE MAXIMUM RATINGS ( $T_A=25^{\circ}\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Gate to Drain Voltage	$V_{GDO}$	-20	V
Drain Current	$I_D$	10	mA
Gate Current	$I_G$	10	mA
Allowable Power Dissipation	$P_D$	100	mW
Junction Temperature	$T_J$	+125	$^{\circ}\text{C}$
Storage Temperature Range	$T_{STG}$	-55 ~ +125	$^{\circ}\text{C}$

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 ( $T_A=25^{\circ}\text{C}$ , unless otherwise specified)

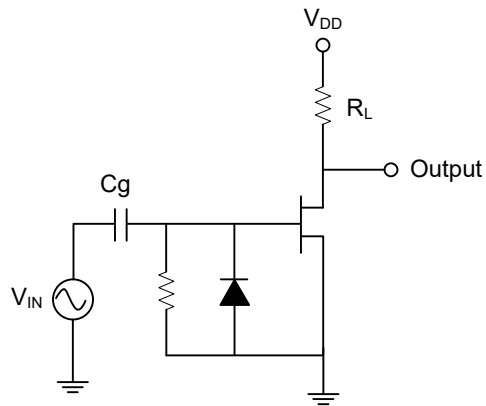
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Gate to Drain Breakdown Voltage	$V_{(BR)GDO}$	$I_G=-100\mu\text{A}$	-20			V
Drain Current	$I_{DSS}$	$V_{DS}=2\text{V}$ , $V_{GS}=0\text{V}$	100		400	$\mu\text{A}$
Gate Off Voltage	$V_{GS(OFF)}$	$V_{DS}=2\text{V}$ , $I_D=1\mu\text{A}$ , $I_{DSS}=250\mu\text{A}$		-0.3		V
Forward Transfer Admittance	$ Y_{fs} $	$V_{DS}=2\text{V}$ , $V_{GS}=0\text{V}$ , $I_{DSS}=250\mu\text{A}$		2.1		mS
Input Capacitance	$C_{ISS}$	$V_{DS}=2\text{V}$ , $V_{GS}=0\text{V}$ , $f=1\text{MHz}$		9.0		pF
Voltage Gain	$G_v$	$V_{DD}=2\text{V}$ , $R_L=2.2\text{k}\Omega$ , $C_g=5\text{pF}$ , $f=1\text{kHz}$ , $V_{IN}=10\text{mV}$ , $I_{DSS}=100\mu\text{A}$		1.3		dB
		$V_{DD}=2\text{V}$ , $R_L=2.2\text{k}\Omega$ , $C_g=5\text{pF}$ , $f=1\text{kHz}$ , $V_{IN}=10\text{mV}$ , $I_{DSS}=250\mu\text{A}$		3.4		dB
		$V_{DD}=2\text{V}$ , $R_L=2.2\text{k}\Omega$ , $C_g=5\text{pF}$ , $f=1\text{kHz}$ , $V_{IN}=10\text{mV}$ , $I_{DSS}=350\mu\text{A}$		3.6		dB
Delta Voltage Gain	$\Delta G_v(V)$	$V_{DD}=2\text{V}\sim 1.5\text{V}$ , $R_L=2.2\text{k}\Omega$ , $C_g=5\text{pF}$ , $f=1\text{kHz}$ , $V_{IN}=10\text{mV}$		-0.7		dB
Frequency Characteristics	$\Delta G_v(f)$	$V_{DD}=2\text{V}$ , $R_L=2.2\text{k}\Omega$ , $C_g=5\text{pF}$ , $f=1\text{kHz}\sim 110\text{Hz}$ , $V_{IN}=10\text{mV}$		-0.2		dB
Output Noise Voltage	$V_{NO}$	$V_{DD}=3\text{V}$ , $C_g=5\text{pF}$ , A-Curve Filter, $R_L=1.0\text{k}\Omega$ , $I_{DSS}=250\mu\text{A}$		-107		dB
		$V_{DD}=3\text{V}$ , $C_g=5\text{pF}$ , A-Curve Filter, $R_L=2.2\text{k}\Omega$ , $I_{DSS}=250\mu\text{A}$		-104		dB
Total Harmonic Distortion	THD	$V_{DD}=2\text{V}$ , $R_L=2.2\text{k}\Omega$ , $C_g=5\text{pF}$ , $f=1\text{kHz}$ , $V_{IN}=30\text{mV}$ , $I_{DSS}=250\mu\text{A}$		1.0		%

■ CLASSIFICATION OF  $I_{DSS}$

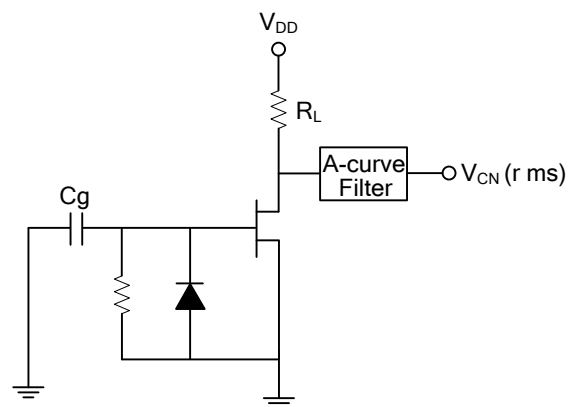
RANK	A	B	C	D
$I_{DSS} (\mu\text{A})$	100 ~ 170	140 ~ 240	210 ~ 350	300 ~ 400

## ■ TEST CIRCUITS

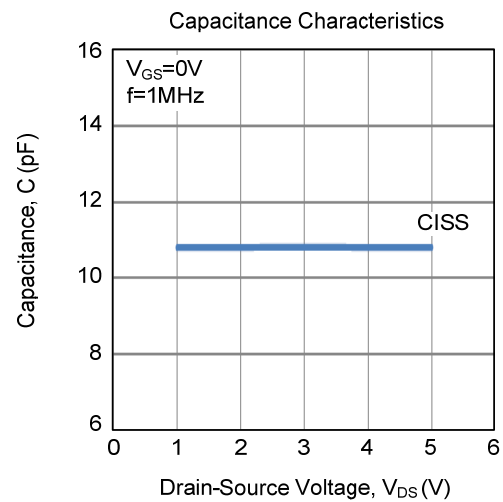
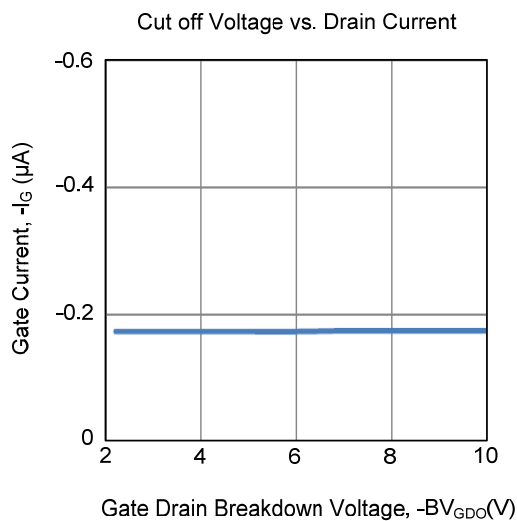
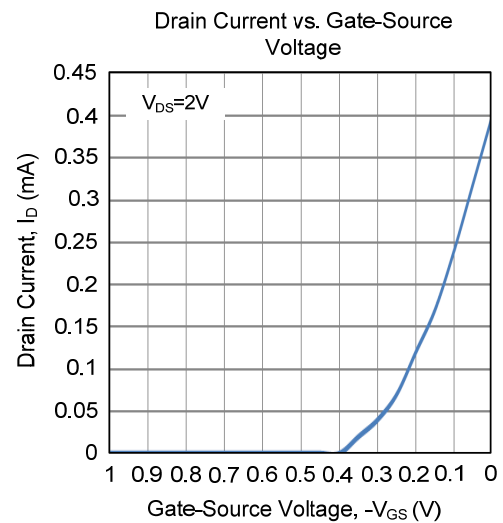
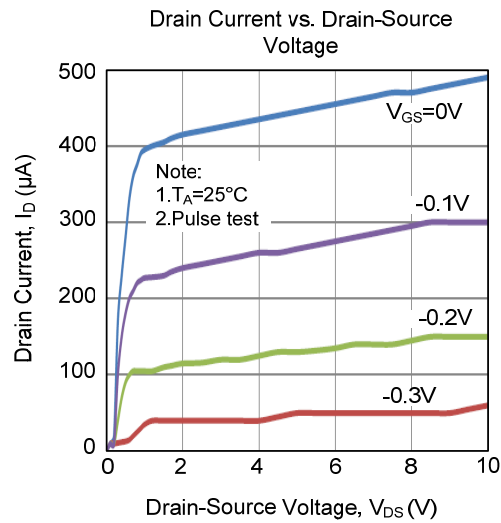
Voltage Gain  
Frequency Characteristics  
Total Harmonic Distortion



Output Noise Voltage



## ■ TYPICAL CHARACTERISTICS



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