

## NTE454

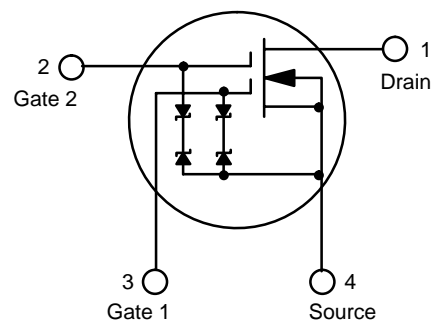
### MOSFET, N-Ch, Dual Gate, TV UHF/RF Amp, Gate Protected

#### **Description:**

The NTE454 is a depletion mode dual gate MOSFET transistor designed for VHF amplifier and mixer applications.

#### **Features:**

- Low Reverse Transfer Capacitance –  $C_{rss} = 0.03\text{pf}$  (Max)
- High Forward Transfer Admittance –  $|y_{fe}| = 0\text{--}20\text{ mmhos}$
- Diode Protected Gates



#### **Absolute Maximum Ratings:**

Drain Source Voltage, $V_{DSX}$	20Vdc
Drain–Gate Voltage, $V_{DG1}$	30Vdc
$V_{DG2}$	30Vdc
Gate Current, $I_{G1}$	$\pm 10\text{mAdc}$
$I_{G2}$	$\pm 10\text{mAdc}$
Drain Current–Continuous, $I_D$	60mAdc
Total Power Dissipation ( $T_A = +25^\circ\text{C}$ ), $P_D$	360mW
Derate above $25^\circ\text{C}$	$2.4\text{mW}/^\circ\text{C}$
Total Power Dissipation ( $T_C = +25^\circ\text{C}$ ), $P_D$	1.2Watt
Derate above $25^\circ\text{C}$	$8.0\text{mW}/^\circ\text{C}$
Storage Channel Temperature Range, $T_{stg}$	$-65$ to $+200^\circ\text{C}$
Junction Temperature Range, $T_J$	$-65$ to $+175^\circ\text{C}$
Lead Temperature, 1/16" from Seated Surface for 10 Seconds, $T_L$	$300^\circ\text{C}$

**Electrical Characteristics:** ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

Characteristics	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain–Source Breakdown Voltage	$V_{(BR)DSX}$	$I_D = 10\mu\text{Adc}$ , $V_5 = 0$ , $V_{GIS} = V_{G25} = 5.0\text{Vdc}$	20	–	–	Vdc
Gate 1= Source Breakdown Voltage (Note 1)	$V_{(BR)G1SO}$	$I_{G1} = \pm 10\text{mAdc}$ , $V_{GIS} = V_{DS} = 0$	$\pm 6.0$	$\pm 12$	$\pm 30$	Vdc
Gate 2–Source Breakdown Voltage (Note 1)	$V_{(BR)G2SO}$	$I_{G2} = \pm 10\text{mAdc}$ , $V_{G15} = V_{D5} = 0$	$\pm 5.0$	$\pm 12$	$\pm 30$	Vdc
Gate 1 to Source Cutoff Voltage	$V_{GIS(off)}$	$V_{DS} = 15\text{Vdc}$ , $V_{G2S} = 4.0\text{Vdc}$ , $I_D = 20\mu\text{Adc}$	–0.5	–1.5	–5.0	Vdc
Gate 2 to Source Cutoff Voltage	$V_{G2S(off)}$	$V_{DS} = 15\text{Vdc}$ , $V_{G15} = 0$ , $I_D = 20\mu\text{Adc}$	–0.2	–1.4	–5.0	Vdc
Gate 1 Leakage Current	$I_{G1SS}$	$V_{GIS} = \pm 5.0\text{Vdc}$ , $V_{G2S} = V_{DS} = 0$	–	$\pm 0.04$	$\pm 10$	nAdc
		$V_{G2S} = -5.0\text{Vdc}$ , $V_{G2S} = V_{DS} = 0$ , $T_A = 150^\circ\text{C}$	–	–	–10	$\mu\text{Adc}$
Gate 2 Leakage Current	$I_{G2SS}$	$V_{G2S} = \pm 5.0\text{Vdc}$ , $V_{GIS} = V_{DS} = 0$	–	$\pm 0.05$	$\pm 10$	nAdc
		$V_{G2S} = -5.0\text{Vdc}$ , $V_{GIS} = V_{DS} = 0$ , $T_A = 150^\circ\text{C}$	–	–	–10	$\mu\text{Adc}$
ON CHARACTERISTICS						
Zero–Gate Voltage Drain Current (Note 2)	$I_{DSS}$	$V_{DS} = 15\text{Vdc}$ , $V_{GIS} = 0$ , $V_{G25} = 4.0\text{Vdc}$	6.0	13	30	mAdc
SMALL–SIGNAL CHARACTERISTICS						
Forward Transfer Admittance (Note 3)	$ y_{fe} $	$V_{DS} = 15\text{Vdc}$ , $V_{G2S} = 4.0\text{Vdc}$ , $V_{GIS} = 0$ , $f = 1.0\text{kHz}$	8.0	12.8	20	mmhos
Input Capacitance	$C_{iss}$	$V_{DS} = 15\text{Vdc}$ , $V_{G2S} = 4.0\text{Vdc}$ , $I_D = I_{DSS}$ , $f = 1.0\text{MHz}$	–	3.3	–	pF
Output Capacitance	$C_{oss}$	$V_{DS} = 15\text{Vdc}$ , $V_{G2S} = 4.0\text{Vdc}$ , $I_D = I_{DSS}$ , $f = 1.0\text{MHz}$	–	1.7	–	pF
Reverse Transfer Capacitance	$C_{rss}$	$V_{DS} = 15\text{Vdc}$ , $V_{G2S} = 4.0\text{Vdc}$ , $I_D = 10\text{mAdc}$ , $f = 1.0\text{MHz}$	0.005	0.014	0.03	pF
FUNCTIONAL CHARACTERISTICS						
Noise Figure	NF	$V_{DD} = 18\text{Vdc}$ , $V_{GG} = 7.0\text{Vdc}$ , $f = 200\text{MHz}$	–	1.8	4.5	dB
Common Source Power Gain	$G_{ps}$	$V_{DD} = 18\text{Vdc}$ , $V_{GG} = 7.0\text{Vdc}$ , $f = 200\text{MHz}$	15	20	25	dB
Bandwidth	BW	$V_{DD} = 18\text{Vdc}$ , $V_{GG} = 7.0\text{Vdc}$ , $f = 200\text{MHz}$	5.0	–	9.0	MHz
Gain Control Gate Supply Voltage (Note 4)	$V_{GG(GC)}$	$V_{DD} = 18\text{Vdc}$ , $\Delta G_{ps} = -30\text{dB}$ , $f = 200\text{MHz}$	0	–1.0	–3.0	Vdc

Note 1. All gate breakdown voltages are measured while the device is conducting rated gate current. This ensures that the gate–voltage limiting network is functioning properly.

Note 2. Pulse Test: Pulse Width =  $300\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$

Note 3. This parameter must be measured with bias voltages supplied for less than 6 seconds to avoid overheating.

Note 4.  $\Delta G_{ps}$  is defined as the change in  $G_{pe}$  from the values at  $V_{GG} = 7.0\text{V}$  power gain conversion

