

2N4854

**Complementary Dual
Small-Signal Transistor**

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MAXIMUM RATINGS				
Rating	Symbol	Value		Unit
Collector-Emitter Voltage	V _{CEO}	40		Vdc
Collector-Base Voltage	V _{CB0}	60		Vdc
Collector 1 to Collector 2 Voltage	V _{C1C2}	±120		Vdc
Emitter-Base Voltage	V _{EBO}	5.0		Vdc
Collector Current — Continuous	I _C	600		mAdc
		One Die	Both Die	
Device Dissipation	P _T	0.3	0.6	Watts
@ T _A = 25°C		1.71	3.43	mW/°C
Derate above 25°C		1.0	2.0	Watts
@ T _C = 25°C		5.71	11.43	mW/°C
Derate above 25°C				
Junction Temperature	T _J	200		°C
Storage Temperature Range	T _{stg}	-65 to 200		°C

ELECTRICAL CHARACTERISTICS (T _A = 25°C unless otherwise noted.)				
Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage ⁽¹⁾ (I _C = 10 mA _{dc})	V _{(BR)CEO}	40	—	V _{dc}
Collector-Base Breakdown Voltage (I _C = 10 μA _{dc})	V _{(BR)CBO}	60	—	V _{dc}
Emitter-Base Breakdown Voltage (I _C = 10 μA _{dc})	V _{(BR)EBO}	5.0	—	V _{dc}
Collector Cutoff Current (V _{CB} = 50 V _{dc}) (V _{CB} = 50 V _{dc} , T _A = 150°C)	I _{CBO}	—	10 10	nA _{dc} μA _{dc}
Emitter Cutoff Current (V _{EB} = 3.0 V _{dc})	I _{EBO}	—	10	nA _{dc}
ON CHARACTERISTICS				
DC Current Gain (I _C = 150 mA _{dc} , V _{CE} = 1.0 V _{dc}) ⁽¹⁾ (I _C = 100 μA _{dc} , V _{CE} = 10 V _{dc}) (I _C = 1.0 mA _{dc} , V _{CE} = 10 V _{dc}) (I _C = 10 mA _{dc} , V _{CE} = 10 V _{dc}) ⁽¹⁾ (I _C = 150 mA _{dc} , V _{CE} = 10 V _{dc}) ⁽¹⁾ (I _C = 300 mA _{dc} , V _{CE} = 10 V _{dc}) ⁽¹⁾ (I _C = 10 mA _{dc} , V _{CE} = 10 V _{dc} , T _A = -55°C)	h _{FE}	50 35 50 75 100 35 12	— — — — 300 — —	—
Collector-Emitter Saturation Voltage ⁽¹⁾ (I _C = 150 mA _{dc} , I _B = 15 mA _{dc})	V _{CE(sat)}	—	0.4	V _{dc}
Base-Emitter Saturation Voltage ⁽¹⁾ (I _C = 150 mA _{dc} , I _B = 15 mA _{dc})	V _{BE(sat)}	0.8	1.25	V _{dc}
Collector-Emitter Voltage (Non latching)	V _{CEO}	40	—	V _{dc}
SMALL-SIGNAL CHARACTERISTICS				
Current Transfer Ratio (I _C = 1.0 mA _{dc} , V _{CE} = 10 V _{dc} , f = 1.0 kHz)	h _{fe}	60	300	—
Input Impedance (I _C = 1.0 mA _{dc} , V _{CE} = 10 V _{dc} , f = 1.0 kHz)	h _{ie}	1.5	9.0	kohms
Output Admittance (I _C = 1.0 mA _{dc} , V _{CE} = 10 V _{dc} , f = 1.0 kHz)	h _{oe}	—	50	μmhos
Small-Signal Current Transfer Ratio, Magnitude (I _C = 20 mA _{dc} , V _{CE} = 10 V _{dc} , f = 100 MHz)	h _{fe}	2.0	8.0	—
Output Capacitance (I _E = 0, V _{CB} = 10 V _{dc} , f = 0.1 to 1.0 MHz)	C _{obo}	—	8.0	pF
Noise Figure (I _C = 100 μA _{dc} , V _{CE} = 10 V _{dc} , R _G = 1.0 kohm, f = 1.0 kHz)	N _F	—	8.0	dB
SWITCHING CHARACTERISTICS (See Figures 10, 21)				
Saturated Turn-On Time	t _{on}	—	45	ns
Saturated Turn-Off Time	t _{off}	—	300	ns
Unsaturated Turn-On + Turn-Off Time	t _{on} + t _{off}	—	18	ns

(1) Pulsed. Pulse Width 250 to 350 μs. Duty Cycle 1.0 to 2.0%.

ASSURANCE TESTING (Pre/Post Burn-In)				
Burn-In Conditions: T _A = 30 ± 5°C, V _{CB} = 30 V _{dc}				
P _T = 300 mW Each Die, 600 mW Total				
Characteristics Tested	Symbol	Initial and End Point Limits		Unit
		Min	Max	
Collector Cutoff Current (V _{CB} = 50 V _{dc})	I _{CBO}	—	10	nA _{dc}
DC Current Gain ⁽¹⁾ (I _C = 150 mA _{dc} , V _{CE} = 10 V _{dc}) ⁽¹⁾	h _{FE}	100	300	—
Delta from Pre-Burn-In Measured Values				
Delta Collector Cutoff Current	ΔI _{CBO}	—	±100 or ±5.0 whichever is greater	% of Initial Value nA _{dc}
Delta DC Current Gain ⁽¹⁾	Δh _{FE}	—	±15	% of Initial Value

(1) Pulsed. Pulse Width 250 to 350 μs. Duty Cycle 1.0 to 2.0%.