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MPSA42

Silicon Complementary Transistors

High Voltage, General Purpose Amplifier

Absolute Maximum Ratings: ($T_A = +25^\circ\text{C}$, unless otherwise specified)

Collector–Emitter Voltage, V_{CEO}	300V
Collector–Base Voltage, V_{CBO}	300V
Emitter–Base Voltage, V_{EBO}	6V
Continuous Collector Current, I_C	500mA
Total Device Dissipation ($T_A = +25^\circ\text{C}$), P_D	625mW
Derate Above $+25^\circ\text{C}$	5mW/ $^\circ\text{C}$
Total Device Dissipation ($T_C = +25^\circ\text{C}$), P_D	1.5W
Derate Above $+25^\circ\text{C}$	12mW/ $^\circ\text{C}$
Operating Junction Temperature, T_J	-55° to $+150^\circ\text{C}$
Storage Temperature Range, T_{stg}	-55° to $+150^\circ\text{C}$
Thermal Resistance, Junction–to–Case, R_{thJC}	83.3 $^\circ\text{C}$
Thermal Resistance, Junction–to–Ambient, R_{thJA}	200 $^\circ\text{C}/\text{W}$

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector–Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 1\text{mA}$, $I_B = 0$, Note 1	300	–	–	V
Collector–Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 100\mu\text{A}$, $I_E = 0$	300	–	–	V
Emitter–Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 10\mu\text{A}$, $I_C = 0$	6	–	–	V
Collector Cutoff Current	I_{CBO}	$V_{CB} = 200\text{V}$, $I_E = 0$	–	–	.1	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB} = 6\text{V}$, $I_C = 0$	–	–	.1	μA
ON Characteristics (Note 1)						
DC Current Gain	h_{fe}	$I_C = 1\text{mA}$, $V_{CE} = 10\text{V}$ $I_C = 10\text{mA}$, $V_{CE} = 10\text{V}$ $I_C = 30\text{mA}$, $V_{CE} = 10\text{V}$	25 40 40	– – –	– – –	
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 20\text{mA}$, $I_B = 2\text{mA}$	–	–	.5	V
Base–Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 20\text{mA}$, $I_B = 2\text{mA}$	–	–	.5	V

Note 1. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Small-Signal Characteristics						
Current-Gain – Bandwidth Product	f_t	$I_C = 10\text{mA}$, $f = 100\text{MHz}$, $V_{CE} = 20\text{V}$	50	–	–	MHz
Collector-Base Capacitance	C_{cb}	$I_E = 0$, $f = 1\text{MHz}$, $V_{CB} = 20\text{V}$	–	–	3.0	MHz

