



- $V_{CE0} \dots 12 \text{ V (Min)}$
- $t_{on} \dots 45 \text{ ns (Max) @ } 10 \text{ mA}$
- $t_{off} \dots 60 \text{ ns (Max) @ } 10 \text{ mA}$
- $f_T \dots 250 \text{ MHz (Min) @ } 10 \text{ mA}$
- $C_{cb} \dots 4.0 \text{ pF (Max)}$
- Complement ... MPSL08

PACKAGE
2N5224
FTSO5224

TO-92
TO-236AA/AB

ABSOLUTE MAXIMUM RATINGS (Note 1)

Temperatures

Storage Temperature $-55^\circ \text{C to } 150^\circ \text{C}$
Operating Junction Temperature 150°C

Power Dissipation (Notes 2 & 3)

Total Dissipation at	2N	FTSO
25° C Ambient Temperature	0.625 W	0.350 W*
25° C Case Temperature	1.0 W	

Voltages & Currents

V_{CE0} Collector to Emitter Voltage	12 V
(Note 4)	
V_{CBO} Collector to Base Voltage	25 V
V_{EBO} Emitter to Base Voltage	5.0 V
I_C DC Collector Current	100 mA

ELECTRICAL CHARACTERISTICS (25° C Ambient Temperature unless otherwise noted) (Note 6)

SYMBOL	CHARACTERISTIC	MIN	MAX	UNITS	TEST CONDITIONS
BV_{CE0}	Collector to Emitter Breakdown Voltage (Note 5)	12		V	$I_C = 10 \text{ mA}, I_B = 0$
BV_{CBO}	Collector to Base Breakdown Voltage	25		V	$I_C = 100 \mu\text{A}, I_E = 0$
BV_{EBO}	Emitter to Base Breakdown Voltage	5.0		V	$I_E = 100 \mu\text{A}, I_C = 0$
I_{EBO}	Emitter Cutoff Current		100	μA	$V_{EB} = 4.0 \text{ V}, I_C = 0$
I_{CBO}	Collector Cutoff Current		500	nA	$V_{CB} = 15 \text{ V}, I_E = 0$
h_{FE}	DC Current Gain (Note 5)	40 15	400		$I_C = 10 \text{ mA}, V_{CE} = 1.0 \text{ V}$ $I_C = 100 \text{ mA}, V_{CE} = 1.0 \text{ V}$
$V_{CE(sat)}$	Collector to Emitter Saturation Voltage (Note 5)		0.35	V	$I_C = 10 \text{ mA}, I_B = 3.0 \text{ mA}$
$V_{BE(sat)}$	Base to Emitter Saturation Voltage (Note 5)		0.9	V	$I_C = 10 \text{ mA}, I_B = 3.0 \text{ mA}$

NOTES:

1. These ratings are limiting values above which the serviceability of any individual semiconductor device may be impaired.
2. These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.
3. These ratings give a maximum junction temperature of 150° C and (TO-92) junction-to-case thermal resistance of 125° C/W (derating factor of 8.0 mW/° C); junction-to-ambient thermal resistance of 200° C/W (derating factor of 5.0 mW/° C); (TO-236) junction-to-ambient thermal resistance of 357° C/W (derating factor of 2.8 mW/° C).
4. Rating refers to a high current point where collector to emitter voltage is lowest.
5. Pulse conditions: length = 300 μs ; duty cycle < 2%.
6. For product family characteristic curves, refer to Curve Set T162.
- * Package mounted on 99.5% alumina 8 mm x 8 mm x 0.6 mm.

ELECTRICAL CHARACTERISTICS (25° C Ambient Temperature unless otherwise noted) (Note 6)

SYMBOL	CHARACTERISTIC	MIN	MAX	UNITS	TEST CONDITIONS
C_{cb}	Collector to Base Capacitance		4.0	pF	$V_{CB} = 5.0 \text{ V}$, $I_E = 0$, $f = 1.0 \text{ MHz}$
f_T	Current Gain Bandwidth Product	250		MHz	$I_C = 10 \text{ mA}$, $V_{CE} = 10 \text{ V}$, $f = 100 \text{ MHz}$
t_d	Delay Time (test circuit no. 531)		25	ns	$I_C = 10 \text{ mA}$, $V_{CC} = 3.0 \text{ V}$, $I_{B1} = 3.0 \text{ mA}$
t_r	Rise Time (test circuit no. 531)		20	ns	$I_C = 10 \text{ mA}$, $V_{CC} = 3.0 \text{ V}$, $I_{B1} = 3.0 \text{ mA}$
t_s	Storage Time (test circuit no. 531)		35	ns	$I_C = 10 \text{ mA}$, $V_{CC} = 3.0 \text{ V}$, $I_{B1} = I_{B2} = 3.0 \text{ mA}$
t_f	Fall Time (test circuit no. 531)		25	ns	$I_C = 10 \text{ mA}$, $V_{CC} = 3.0 \text{ V}$, $I_{B1} = I_{B2} = 3.0 \text{ mA}$