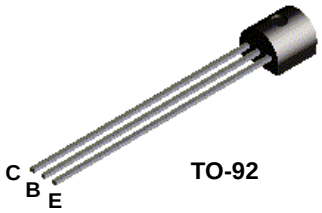
FAIRCHILD SEMICONDUCTOR TM

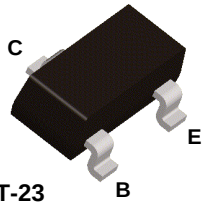
Discrete POWER & Signal Technologies

2N5771



TO-92

MMBT5771



SOT-23
Mark: 3R

PNP Switching Transistor

This device is designed for very high speed saturate switching at collector currents to 100 mA. Sourced from Process 65. See PN4258 for characteristics.

Absolute Maximum Ratings*

TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V_{CEO}	Collector-Emitter Voltage	15	V
V_{CBO}	Collector-Base Voltage	15	V
V_{EBO}	Emitter-Base Voltage	4.5	V
I_C	Collector Current - Continuous	200	mA
T_J, T_{stg}	Operating and Storage Junction Temperature Range	-55 to +150	°C

*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

NOTES:
1) These ratings are based on a maximum junction temperature of 150 degrees C.
2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

Thermal Characteristics

TA = 25°C unless otherwise noted

Symbol	Characteristic	Max		Units
		2N5771	*MMBT5771	
P_D	Total Device Dissipation Derate above 25°C	350 2.8	225 1.8	mW mW/°C
$R_{\theta JC}$	Thermal Resistance, Junction to Case	125		°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	357	556	°C/W

*Device mounted on FR-4 PCB 1.6" X 1.6" X 0.06."

PNP Switching Transistor
(continued)

Electrical Characteristics
TA = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Max	Units
OFF CHARACTERISTICS					
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage*	I_C = 3.0 mA, I_B = 0	15		V
$V_{(BR)CES}$	Collector-Emitter Breakdown Voltage	I_C = 100 µA, V_{BE} = 0	15		V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	I_C = 100 µA, I_E = 0	15		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	I_E = 100 µA, I_C = 0	4.5		V
I_{CBO}	Collector Cutoff Current	V_{CB} = 8.0 V, I_E = 0		10	nA
I_{CES}	Collector Cutoff Current	V_{CE} = 8.0 V, V_{BE} = 0 V_{CE} = 8.0 V, V_{BE} = 0, T_A= 125°C		10 5.0	nA µA
I_{EBO}	Emitter Cutoff Current	V_{EB} = 4.5 V, I_C = 0		1.0	µA
ON CHARACTERISTICS*					
h_{FE}	DC Current Gain	I_C = 1.0 mA, V_{CE} = 0.5 V I_C = 10 mA, V_{CE} = 0.3 V I_C = 10mA,V_{CE} = 0.3V,T_A = -55°C I_C = 50 mA, V_{CE} = 1.0 V	35 50 20 40	 120 	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C = 1.0 mA, I_B = 0.1 mA I_C = 10 mA, I_B = 1.0 mA I_C = 50 mA, I_B = 5.0 mA		0.15 0.18 0.6	V V V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	I_C = 1.0 mA, I_B = 0.1 mA I_C = 10 mA, I_B = 1.0 mA I_C = 50 mA, I_B = 5.0 mA	 0.75 	0.8 0.95 1.5	V V V
SMALL SIGNAL CHARACTERISTICS					
C_{cb}	Collector-Base Capacitance	V_{CB} = 5.0 V, I_E = 0, f = 140 kHz		3.0	pF
C_{eb}	Emitter-Base Capacitance	V_{BE} = 0.5 V, I_C = 0, f = 140 kHz		3.5	pF
h_{fe}	Small-Signal Current Gain	I_C = 10 mA, V_{CE} = 10 V, f = 100 MHz	8.5		MHz
SWITCHING CHARACTERISTICS					
t_s	Storage Time	I_C = 10 mA, V_{CC} = 1.5 V, I_{B1} = I_{B2} = 1.0 mA		20	ns
t_{on}	Turn-On Time	I_C = 10 mA, V_{CC} = 1.5 V, I_B = 1.0 mA		15	ns
t_{off}	Turn-Off Time	I_C = 10 mA, V_{CC} = 1.5 V, I_{B1} = I_{B2} = 1.0 mA		20	ns

*Pulse Test: Pulse Width ≤ 300 µs, Duty Cycle ≤ 2.0%

Discrete POWER & Signal Technologies

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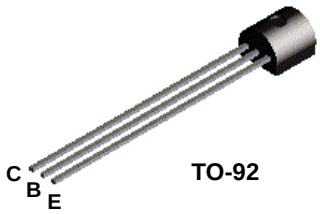
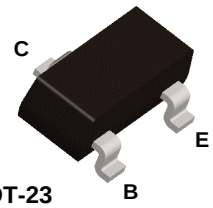
2N6427



TO-92

MMBT6427



SOT-23
Mark: 1V

NPN Darlington Transistor

This device is designed for applications requiring extremely high current gain at collector currents to 1.0 A. Sourced from Process 05. See MPSA14 for characteristics.

Absolute Maximum Ratings*

TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V_{CEO}	Collector-Emitter Voltage	40	V
V_{CBO}	Collector-Base Voltage	40	V
V_{EBO}	Emitter-Base Voltage	12	V
I_C	Collector Current - Continuous	1.2	A
T_J, T_{stg}	Operating and Storage Junction Temperature Range	-55 to +150	°C

*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

NOTES:
1) These ratings are based on a maximum junction temperature of 150 degrees C.
2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

Thermal Characteristics

TA = 25°C unless otherwise noted

Symbol	Characteristic	Max		Units
		2N6427	*MMBT6427	
P_D	Total Device Dissipation Derate above 25°C	625 5.0	350 2.8	mW mW/°C
$R_{\theta JC}$	Thermal Resistance, Junction to Case	83.3		°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	200	357	°C/W

*Device mounted on FR-4 PCB 1.6" X 1.6" X 0.06."

NPN Darlington Transistor
(continued)

Electrical Characteristics
TA = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Max	Units
OFF CHARACTERISTICS					
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage*	I_C = 10 mA, I_B = 0	40		V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	I_C = 100 µA, I_E = 0	40		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	I_E = 10 µA, I_C = 0	12		V
I_{CEO}	Collector Cutoff Current	V_{CE} = 25 V, I_B = 0		1.0	µA
I_{CBO}	Collector Cutoff Current	V_{CB} = 30 V, I_E = 0		50	nA
I_{EBO}	Emitter Cutoff Current	V_{EB} = 10 V, I_C = 0		50	nA
ON CHARACTERISTICS					
h_{FE}	DC Current Gain*	I_C = 10 mA, V_{CE} = 5.0 V I_C = 100 mA, V_{CE} = 5.0 V I_C = 500 mA, V_{CE} = 5.0 V	10,000 20,000 14,000	100,000 200,000 140,000	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C = 50 mA, I_B = 0.5 mA I_C = 500 mA, I_B = 0.5 mA		1.2 1.5	V V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	I_C = 500 mA, I_B = 0.5 mA		2.0	V
$V_{BE(on)}$	Base-Emitter On Voltage	I_C = 50 mA, V_{CE} = 5.0 mA		1.75	V
SMALL SIGNAL CHARACTERISTICS					
C_{obo}	Output Capacitance	V_{CB} = 10 V, I_E = 0, f = 1.0 MHz		7.0	pF
C_{ibo}	Input Capcitance	V_{BE} = 1.0 V, I_C = 0, f = 1.0 MHz		15	pF

*Pulse Test: Pulse Width ≤ 300 µs, Duty Cycle ≤ 2.0%