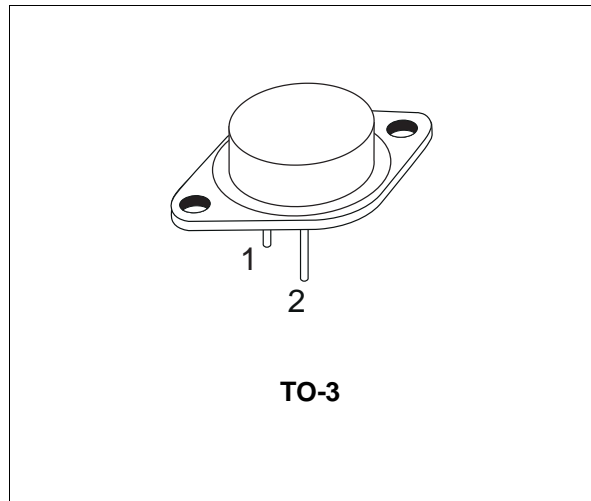


HIGH CURRENT NPN SILICON TRANSISTOR

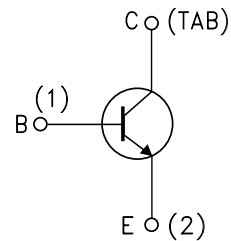
- SGS-THOMSON PREFERRED SALESTYPE
- NPN TRANSISTOR

DESCRIPTION

The 2N5038 is a silicon planar multiepitaxial NPN transistors in Jedec TO-3 metal case. They are especially intended for high current and switching applications.



INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage ($I_E = 0$)	150	V
V_{CEX}	Collector-Emitter Voltage ($V_{BE} = -1.5V$ $R_{BE} = 100\Omega$)	150	V
V_{CER}	Collector-Emitter Voltage ($R_{BE} < 50\Omega$)	110	V
V_{CEO}	Collector-Emitter Voltage ($I_B = 0$)	90	V
V_{EBO}	Emitter-Base Voltage ($I_C = 0$)	7	V
I_C	Collector Current	20	A
I_{CM}	Collector Peak Current	30	A
I_B	Base Current	5	A
P_{tot}	Total Dissipation at $T_c \leq 25^\circ C$	140	W
T_{stg}	Storage Temperature	-65 to 200	$^\circ C$
T_j	Max. Operating Junction Temperature	200	$^\circ C$

THERMAL DATA

R _{thj-case}	Thermal Resistance Junction-case	Max	1.25	°C/W
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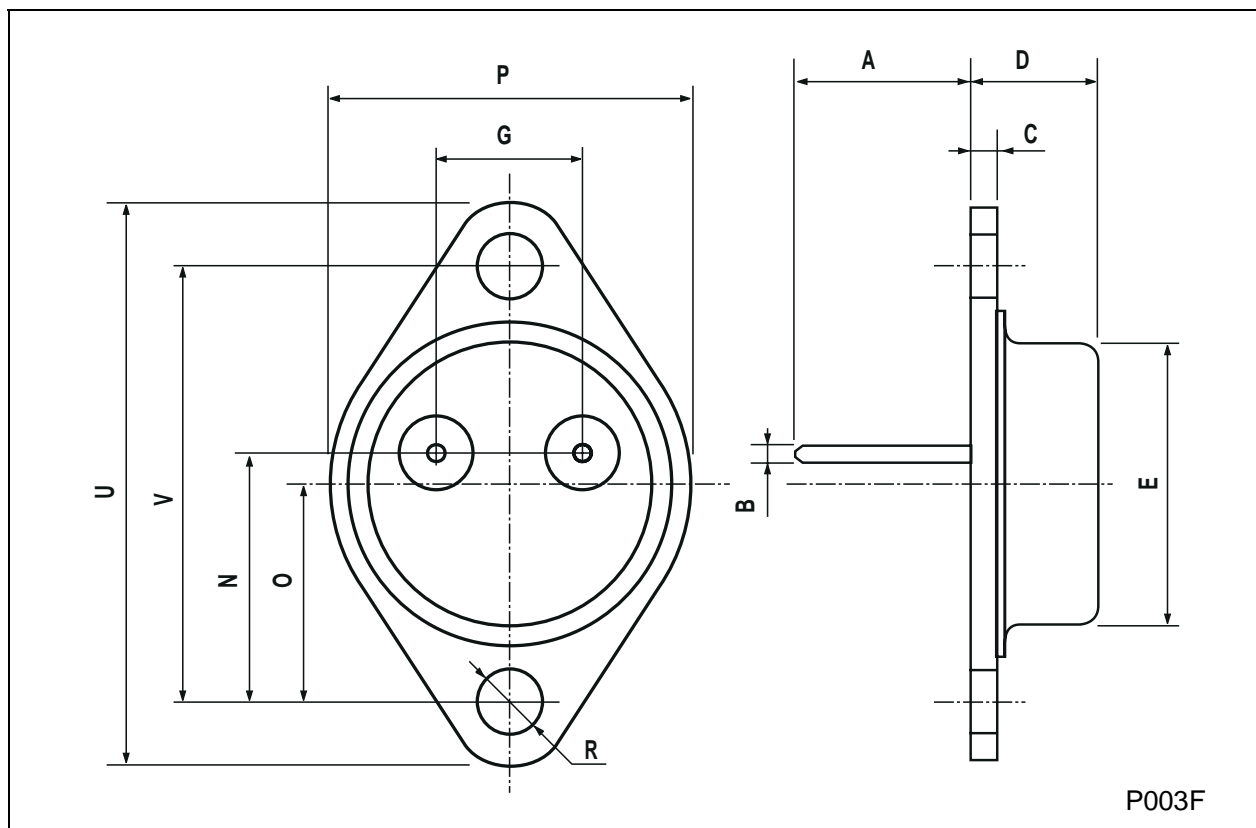
ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I _{CEV}	Collector Cut-off Current (V _{BE} = -1.5V)	V _{CE} = 140 V V _{CE} = 100 V T _C = 150 °C			50 10	mA mA
I _{CEO}	Collector Cut-off Current (I _B = 0)	V _{CE} = 70 V			20	mA
I _{EBO}	Emitter Cut-off Current (I _C = 0)	V _{EB} = 7 V V _{EB} = 5 V			50 5	mA mA
V _{CEO(sus)*}	Collector-Emitter Sustaining Voltage	I _C = 0.2 A	90			V
V _{CER(sus)*}	Collector-Emitter Sustaining Voltage	I _C = 0.2 A R _{BE} = 50 Ω	110			V
V _{CEx(sus)*}	Collector-Emitter Sustaining Voltage	I _C = 0.2 A R _{BE} = 100 Ω V _{BE} = -1.5V	150			V
V _{CE(sat)*}	Collector-Emitter Saturation Voltage	I _C = 12 A I _B = 1.2 A I _C = 20 A I _B = 5 A			1 2.5	V V
V _{BE(sat)*}	Collector-Emitter Saturation Voltage	I _C = 20 A I _B = 5 A			3.3	V
V _{BE*}	Base-Emitter Voltage	I _C = 12 A V _{CE} = 5 V			1.8	V
h _{FE*}	DC Current Gain	I _C = 2 A V _{CE} = 5 V I _C = 12 A V _{CE} = 5 V	50 20		250 100	
h _{fe}	Small Signal Current Gain	I _C = 2 A V _{CE} = 10 V f = 5 MHz	12			
C _{CB0}	Collector-Base Capacitance	I _E = 0 V _{CB} = 10 V f = 1 MHz			300	pF
t _r	Rise Time	I _C = 12 A V _{CC} = 30 V I _{B1} = -I _{B2} = 1.2A			0.5	μs
t _s	Storage Time				1.5	μs
t _f	Fall Time				0.5	μs
I _{s/b**}	Second Breakdown Collector Current	V _{CE} = 28 V V _{CE} = 45 V	5 0.9			A A
E _{s/b}	Second Breakdown Energy	V _{BE} = -4 V R _{BE} = 20 Ω L = 180μH	13			mJ

* Pulsed: Pulse duration = 300 μs, duty cycle 1.5 %

TO-3 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	11.00		13.10	0.433		0.516
B	0.97		1.15	0.038		0.045
C	1.50		1.65	0.059		0.065
D	8.32		8.92	0.327		0.351
E	19.00		20.00	0.748		0.787
G	10.70		11.10	0.421		0.437
N	16.50		17.20	0.649		0.677
P	25.00		26.00	0.984		1.023
R	4.00		4.09	0.157		0.161
U	38.50		39.30	1.515		1.547
V	30.00		30.30	1.187		1.193



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