2N5038
2N5039

SILICON
NPN POWER TRANSISTORS

TO-3 CASE

Central Semiconductor Corp.

www.centralsemi.com

DESCRIPTION:

The CENTRAL SEMICONDUCTOR 2N5038 and 2N5039 are silicon NPN power transistors designed for power amplifier and power oscillator applications where high current, high voltage, and fast switching speeds are required.

MARKING: FULL PART NUMBER

MAXIMUM RATINGS: (T_C=25°C)	**SYMBOL**	**2N5038**	**2N5039**	**UNITS**
Collector-Base Voltage	V_{CBO}	150	120	V
Collector-Emitter Voltage	V_{CEX}	150	120	V
Collector-Emitter Voltage	V_{CER}	110	95	V
Collector-Emitter Voltage	V_{CEO}	90	75	V
Emitter-Base Voltage	V_{EBO}	7.0		V
Continuous Collector Current	I_C	20		A
Peak Collector Current	I_{CM}	30		A
Continuous Base Current	I_B	5.0		A
Power Dissipation	P_D	140		W
Operating and Storage Junction Temperature	T_J, T_{stg}	-65 to +200		°C
Thermal Resistance	Θ_{JC}	1.25		°C/W

ELECTRICAL CHARACTERISTICS: (T_C=25°C unless otherwise noted)

		2N5038		**2N5039**		
SYMBOL	**TEST CONDITIONS**	**MIN**	**MAX**	**MIN**	**MAX**	**UNITS**
I_{CEV}	V_{CE}=140V, V_{BE}=1.5V	-	50	-	-	mA
I_{CEV}	V_{CE}=110V, V_{BE}=1.5V	-	-	-	50	mA
I_{CEV}	V_{CE}=100V, V_{BE}=1.5V, T_C=150°C	-	10	-	-	mA
I_{CEV}	V_{CE}=85V, V_{BE}=1.5V, T_C=150°C	-	-	-	10	mA
I_{CEO}	V_{CE}=70V	-	20	-	-	mA
I_{CEO}	V_{CE}=55V	-	-	-	20	mA
I_{EBO}	V_{EB}=5.0V	-	5.0	-	15	mA
I_{EBO}	V_{EB}=7.0V	-	50	-	50	mA
BV_{CEX}	I_C=200mA, V_{BE}=1.5V	150	-	120	-	V
BV_{CER}	I_C=200mA, R_{BE}≤50Ω	110	-	95	-	V
BV_{CEO}	I_C=200mA	90	-	75	-	V
BV_{EBO}	I_E=50mA	7.0	-	7.0	-	V
$V_{CE(SAT)}$	I_C=12A, I_B=1.2A	-	1.0	-	-	V
$V_{CE(SAT)}$	I_C=10A, I_B=1.0A	-	-	-	1.0	V
$V_{CE(SAT)}$	I_C=20A, I_B=5.0A	-	2.5	-	2.5	V
$V_{BE(SAT)}$	I_C=20A, I_B=5.0A	-	3.3	-	3.3	V
$V_{BE(ON)}$	V_{CE}=5.0V, I_C=12A	-	1.8	-	-	V
$V_{BE(ON)}$	V_{CE}=5.0V, I_C=10A	-	-	-	1.8	V
h_{FE}	V_{CE}=5.0V, I_C=2.0A	50	250	30	250	
h_{FE}	V_{CE}=5.0V, I_C=10A	-	-	20	100	
h_{FE}	V_{CE}=5.0V, I_C=12A	20	100	-	-	

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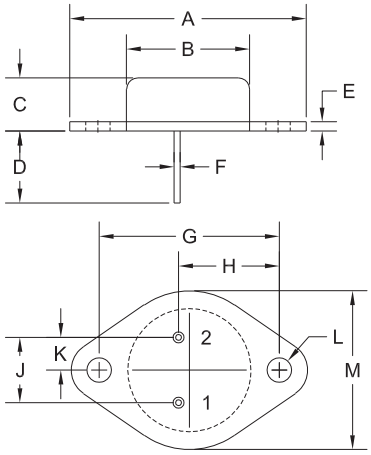
ELECTRICAL CHARACTERISTICS - Continued: (T_C=25°C unless otherwise noted)

		2N5038		2N5039		
SYMBOL	**TEST CONDITIONS**	**MIN**	**MAX**	**MIN**	**MAX**	**UNITS**
f_T	V_{CE}=10V, I_C=2.0A, f=5.0MHz	60	-	60	-	MHz
C_{ob}	V_{CB}=10V, I_E=0, f=1.0MHz	-	400	-	400	pF
$I_{s/b}$	V_{CE}=28V, t=1.0s	5.0	-	5.0	-	A
$I_{s/b}$	V_{CE}=45V, t=1.0s	0.9	-	0.9	-	A
t_r	V_{CC}=30V, I_C=12A, I_{B1}=I_{B2}=1.2A	-	0.5	-	-	μs
t_r	V_{CC}=30V, I_C=10A, I_{B1}=I_{B2}=1.0A	-	-	-	0.5	μs
t_s	V_{CC}=30V, I_C=12A, I_{B1}=I_{B2}=1.2A	-	1.5	-	-	μs
t_s	V_{CC}=30V, I_C=10A, I_{B1}=I_{B2}=1.0A	-	-	-	1.5	μs
t_f	V_{CC}=30V, I_C=12A, I_{B1}=I_{B2}=1.2A	-	0.5	-	-	μs
t_f	V_{CC}=30V, I_C=10A, I_{B1}=I_{B2}=1.0A	-	-	-	0.5	μs

TO-3 CASE - MECHANICAL OUTLINE



DIMENSIONS				
	INCHES		MILLIMETERS	
SYMBOL	MIN	MAX	MIN	MAX
A	1.516	1.573	38.50	39.96
B (DIA)	0.748	0.875	19.00	22.23
C	0.250	0.450	6.35	11.43
D	0.433	0.516	11.00	13.10
E	0.054	0.065	1.38	1.65
F	0.035	0.045	0.90	1.15
G	1.177	1.197	29.90	30.40
H	0.650	0.681	16.50	17.30
J	0.420	0.440	10.67	11.18
K	0.205	0.225	5.21	5.72
L (DIA)	0.151	0.172	3.84	4.36
M	0.984	1.050	25.00	26.67

TO-3 (REV: R2)

R2

LEAD CODE:
1) Base
2) Emitter
Case) Collector

MARKING:
FULL PART NUMBER

R1 (17-March 2015)

OUTSTANDING SUPPORT AND SUPERIOR SERVICES

PRODUCT SUPPORT

Central's operations team provides the highest level of support to insure product is delivered on-time.

- Supply management (Customer portals)
- Inventory bonding
- Consolidated shipping options
- Custom bar coding for shipments
- Custom product packing

DESIGNER SUPPORT/SERVICES

Central's applications engineering team is ready to discuss your design challenges. Just ask.

- Free quick ship samples (2nd day air)
- Online technical data and parametric search
- SPICE models
- Custom electrical curves
- Environmental regulation compliance
- Customer specific screening
- Up-screening capabilities
- Special wafer diffusions
- PbSn plating options
- Package details
- Application notes
- Application and design sample kits
- Custom product and package development

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