

CentralTM Semiconductor Corp.

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Manufacturers of World Class Discrete Semiconductors

2N3009
2N3013
2N3014

NPN SILICON HIGH SPEED
SWITCHING TRANSISTORS

JEDEC TO-18 CASE

DESCRIPTION

The CENTRAL SEMICONDUCTOR 2N3009, 2N3013, 2N3014 types are Silicon NPN switching Transistors designed for high speed, medium power saturated switching applications.

MAXIMUM RATINGS (T_A=25°C unless otherwise noted)

	SYMBOL	2N3009	2N3013	2N3014	UNIT
Collector-Base Voltage	V _{CB0}	40	40	40	V
Collector-Emitter Voltage	V _{CES}	40	40	40	V
Collector-Emitter Voltage	V _{CEO}	15	15	20	V
Emitter-Base Voltage	V _{EBO}	4.0	5.0	5.0	V
Collector Current	I _C	200	200	200	mA
Collector Current Peak (10μs pulse)	I _C	500	500	500	mA
Power Dissipation	P _D	360	360	300	mW
Power Dissipation (T _C =25°C)	P _D	1.2	1.2	1.2	W
Oper. and Storage Junction Temp.	T _J , T _{stg}		-65 TO +200		°C

ELECTRICAL CHARACTERISTICS (T_A=25°C)

SYMBOL	TEST CONDITIONS	2N3009		2N3013		2N3014		UNIT
		MIN	MAX	MIN	MAX	MIN	MAX	
I _{CES}	V _{CE} =20V		0.5		0.3		0.3	μA
I _B	V _{CE} =20V, V _{BE} =0		0.5		0.3		0.3	μA
BV _{CB0}	I _C =100μA	40		40		40		V
BV _{CES}	I _C =100μA	40		40		40		V
BV _{CEO}	I _C =10mA	15		15		20		V
BV _{EBO}	I _E =100μA	4.0		5.0		5.0		V
V _{CE} (SAT)	I _C =30mA, I _B =3.0mA		0.18		0.18		0.18	V
V _{CE} (SAT)	I _C =100mA, I _B =10mA		0.28		0.28		0.35	V
V _{CE} (SAT)	I _C =300mA, I _B =30mA		0.5		0.5		-	V
V _{CE} (SAT)	I _C =10mA, I _B =1.0mA		-		-		0.18	V
V _{BE} (SAT)	I _C =30mA, I _B =3.0mA	0.75	0.95	0.75	0.95	0.75	0.95	V
V _{BE} (SAT)	I _C =100mA, I _B =10mA		1.2		1.2		1.2	V
V _{BE} (SAT)	I _C =300mA, I _B =30mA		1.7		1.7		-	V
V _{BE} (SAT)	I _C =10mA, I _B =1.0mA	-	-	-	-	0.7	0.8	V
h _{FE}	V _{CE} =0.4V, I _C =30mA	30	120	30	120	30	120	
h _{FE}	V _{CE} =0.4V, I _C =10mA	-	-	-	-	25	-	
h _{FE}	V _{CE} =0.5V, I _C =100mA	25	-	25	-	-	-	
h _{FE}	V _{CE} =1.0V, I _C =100mA	-	-	-	-	25	-	
h _{FE}	V _{CE} =1.0V, I _C =300mA	15	-	15	-	-	-	
f _T	V _{CE} =10V, I _C =30mA, f=100MHz	350	-	350	-	350	-	MHz
C _{ob}	V _{CB} =5.0V, I _E =0, f=140kHz		5.0		5.0		5.0	pF
C _{ib}	V _{BE} =0.5, I _C =0, f=140kHz		8.0		8.0		8.0	pF
t _{on}	V _{CC} =15V, I _C =300mA, I _{B1} ≈30mA		15		15		-	ns
t _{on}	V _{CC} =2.0V, I _C =30mA, I _{B1} ≈3.0mA		-		-		16	ns
t _{off}	V _{CC} =15V, I _C =300mA, I _{B1} ≈I _{B2} ≈30mA		25		25		-	ns
t _{off}	V _{CC} =2.0V, I _C =30mA, I _{B1} ≈I _{B2} ≈3.0mA		-		-		25	ns
τ _s	I _C ≈I _{B1} ≈I _{B2} ≈10mA		18		18		18	ns

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