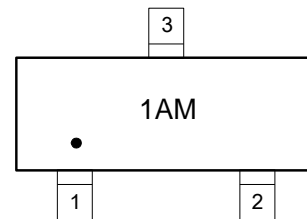


**WNT2F04**
**NPN, General Purpose Transistors**
[Http://www.willsemi.com](http://www.willsemi.com)
**Descriptions**

The WNT2F04 is designed for general purpose amplifier applications. Standard products are Pb-free and Halogen-free


**SOT-23**
**Features**

- Complementary to WPT2F06
- Collector Current:  $I_c=0.2A$

**(Top View)**

**Marking :1AM**

- 1: BASE**
- 2: EMITTER**
- 3: COLLECTOR**

**Order information**

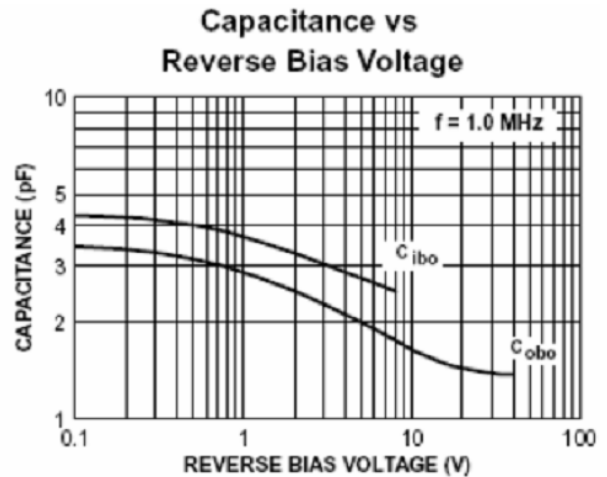
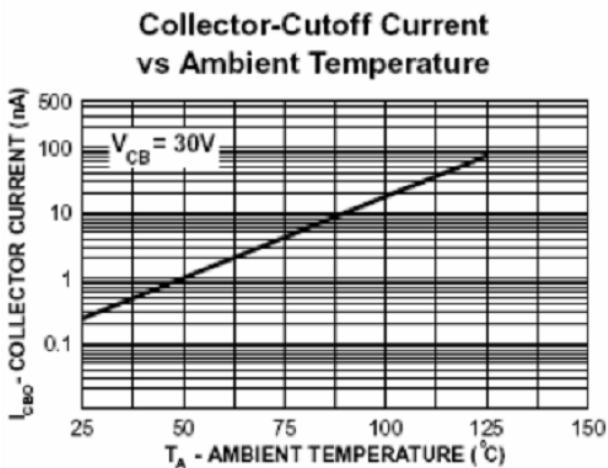
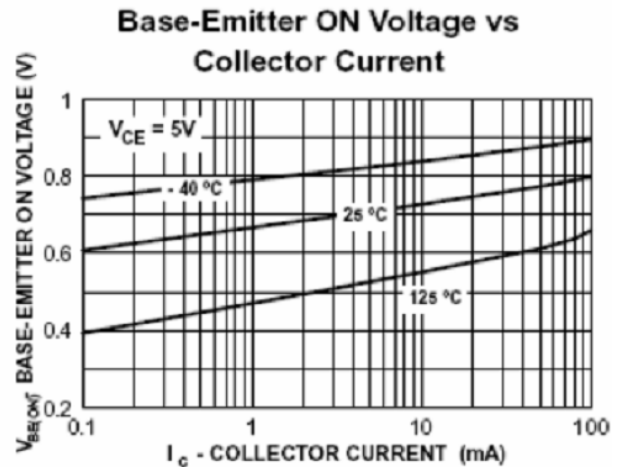
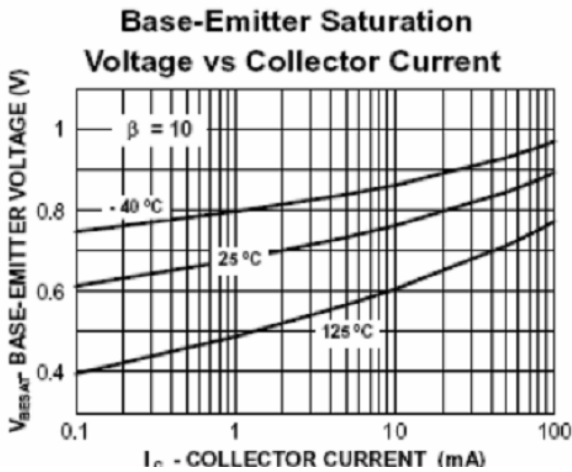
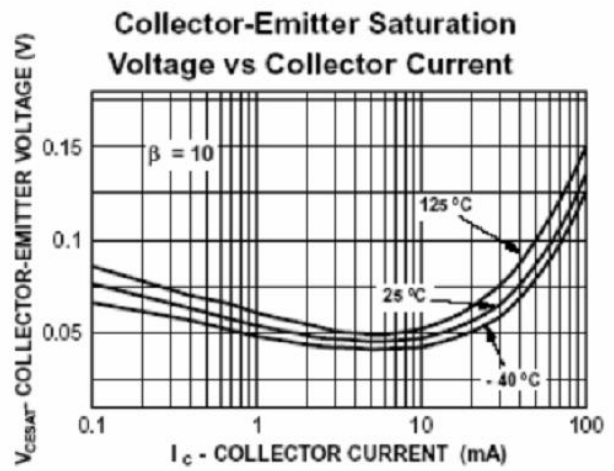
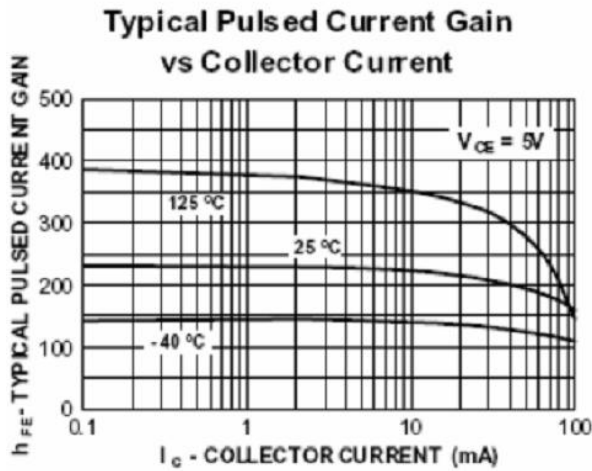
Device	Package	Shipping
WNT2F04-3/TR	SOT-23	3000/Reel&Tape

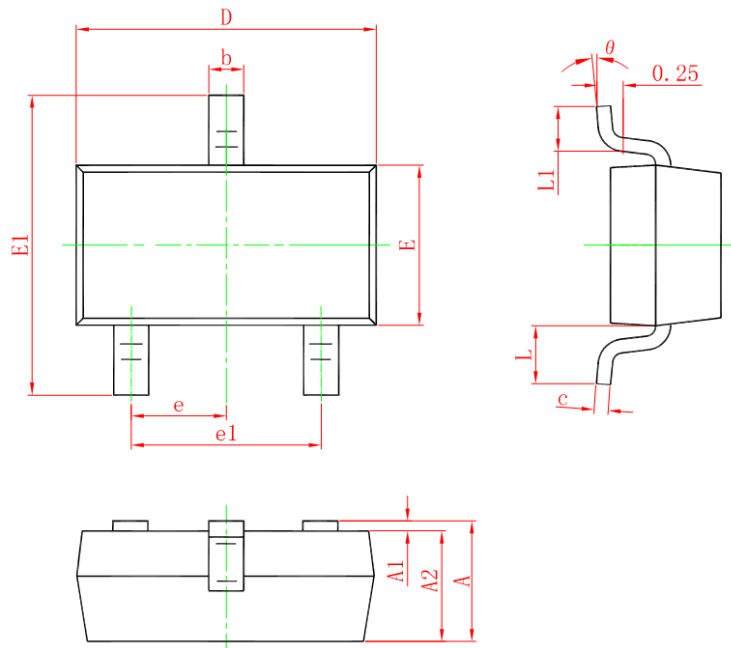
**Absolute maximum ratings**

Parameter	Symbol	Value	Unit
Collector-emitter Voltage	$V_{CEO}$	40	V
Collector-base Voltage	$V_{CBO}$	60	V
Emitter-base Voltage	$V_{EBO}$	6	V
Continues Collector Current	$I_C$	200	mA
Collector Power Dissipation	$P_C$	250	mW
Thermal Resistance From Junction To Ambient	$R_{\theta JA}$	625	$^{\circ}C /W$
Junction Temperature	$T_J$	150	$^{\circ}C$
Operating Temperature	$T_{OPR}$	0~+70	$^{\circ}C$
Storage Temperature Range	$T_{stg}$	-55~+150	$^{\circ}C$

**Electronics Characteristics** ( $T_a=25^{\circ}\text{C}$ , unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Max.	Unit
Collector-emitter breakdown voltage	$BV_{CEO}$	$I_C=1\text{mA}, I_B=0\text{mA}$	40		V
Collector-base breakdown voltage	$BV_{CBO}$	$I_C=10\mu\text{A}, I_E=0\text{mA}$	60		V
Emitter-base breakdown voltage	$BV_{EBO}$	$I_E=10\mu\text{A}, I_C=0\text{mA}$	6		V
Collector cutoff current	$I_{CEX}$	$V_{CE}=30\text{V},$ $V_{EB(OFF)}=3\text{V}$		50	nA
Collector cutoff current	$I_{CBO}$	$V_{CB}=60\text{V}, I_E=0\text{A}$		100	nA
Emitter cutoff current	$I_{EBO}$	$V_{EB}=5\text{V}, I_C=0\text{A}$		100	nA
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C=50\text{mA}, I_B=5\text{mA}$		0.3	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C=50\text{mA}, I_B=5\text{mA}$		0.95	V
DC current gain	$h_{FE}$	$V_{CE}=1\text{V}, I_C=1\text{mA}$	80		
		$V_{CE}=1\text{V}, I_C=10\text{mA}$	100	300	
		$V_{CE}=1\text{V}, I_C=50\text{mA}$	60		
Collector capacitance	$C_C$	$I_E=I_C=0; V_{CE}=5\text{V};$ $f=1\text{MHz}$		4	pF
Emitter capacitance	$C_E$	$I_C=I_C=0; V_{BE}=0.5\text{V};$ $f=1\text{MHz}$		8	pF
Noise figure	F	$I_C=100\text{mA};$ $V_{CE}=5\text{V}; R_S=1\text{k}\Omega;$ $f=10\text{Hz to }15.7\text{kHz}$		5	dB
Transition frequency	$f_T$	$V_{CE}=20\text{V},$ $I_C=10\text{mA},$ $f=100\text{MHz}$	300		MHz
Delay time	$t_d$	$V_{CC}=3\text{V},$ $V_{BE(off)}=-0.5\text{V}$ $I_C=10\text{mA},$ $I_{B1}=1\text{mA}$		35	ns
Rise time	$t_r$			35	ns
Storage time	$t_s$			200	ns
Fall time	$t_f$		$I_{B1}= I_{B2}=1\text{mA}$		50

**Typical characteristics** ( $T_a=25^\circ\text{C}$ , unless otherwise noted)


**Package outline dimensions**
**SOT-23**


Symbol	Dimensions in millimeter		
	Min.	Typ.	Max.
A	0.900	1.025	1.150
A1	0.000	0.500	0.100
A2	0.900	0.975	1.050
b	0.300	0.400	0.500
c	0.080	0.115	0.150
D	2.800	2.900	3.000
E	1.200	1.300	1.400
E1	2.250	2.400	2.550
e	0.950TYP		
e1	1.800	1.900	2.000
L	0.500REF		
L1	0.300	0.400	0.500
$\theta$	0°	4°	8°

**Recommend PCB Layout (Unit: mm)**
