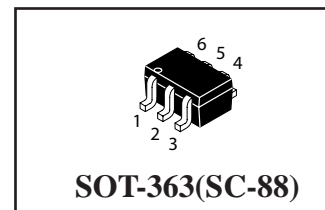
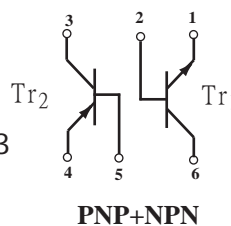


Dual Epitaxial Planer Transistor

 Lead(Pb)-Free

Features:

* Both a 2SA1037AK chip and 2SC2412K chip in a SOT-363



Maximum Ratings

Parameter		Symbol	Value	Unit
Collector-Emitter Voltage	NPN	V _{CEO}	50	Vdc
	PNP		-50	
Collector-Base Voltage	NPN	V _{CBO}	60	Vdc
	PNP		-60	
Emitter-Base Voltage	NPN	V _{EBO}	6.0	Vdc
	PNP		-6.0	
Collector Current-Continuous	NPN PNP	I _C	150 -150	mAdc

Thermal Characteristics

Characteristics	Symbol	Max	Unit
Total Device Dissipation FR-5 Board, ⁽¹⁾ T _A =25 °C	P _D	380	mW
Thermal Resistance, Junction to Ambient	R _{θJA}	328	°C/W
Junction and Storage, Temperature	T _J , T _{stg}	-55 to +150	°C

1. FR-5 = 1.0 x 0.75 x 0.062 in

Device Marking

WSD4601DW = 5C

Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise noted)

Characteristics	Symbol	Min	Typ	Max	Unit
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Off Characteristics

Collector-Emitter Breakdown Voltage ($I_C = 1.0\text{mA}$) ($I_C = -1.0\text{mA}$)	NPN PNP	$V_{(BR)CEO}$	50 -50	- -	- -	V
Collector-Base Breakdown Voltage ($I_C = 50\ \mu\text{A}$) ($I_C = -50\ \mu\text{A}$)	NPN PNP	$V_{(BR)CBO}$	60 -60	- -	- -	V
Emitter-Base Breakdown Voltage ($I_E = 50\ \mu\text{A}$) ($I_E = -50\ \mu\text{A}$)	NPN PNP	$V_{(BR)EBO}$	6.0 -6.0	- -	- -	V
Collector Cutoff Current ($V_{CB} = 60\text{V}$) ($V_{CB} = -60\text{V}$)	NPN PNP	I_{CBO}	- -	- -	0.1 -0.1	μA
Emitter Cutoff Current ($V_{EB} = 7.0\text{V}$) ($V_{EB} = -7.0\text{V}$)	NPN PNP	I_{EBO}	- -	- -	0.1 -0.1	μA

On Characteristics

DC Current Gain ($I_C = 1.0\text{mA}$, $V_{CE} = 6.0\text{V}$) ($I_C = -1.0\text{mA}$, $V_{CE} = -6.0\text{V}$)	NPN PNP	h_{FE}	120 120	- -	560 560	
Collector-Emitter Saturation Voltage ($I_C = 50\text{mA}$, $I_B = 5.0\text{mA}$) ($I_C = 50\text{mA}$, $I_B = -5.0\text{mA}$)	NPN PNP	$V_{CE(sat)}$	- -	- -	0.4 -0.5	V

Small-Signal Characteristics

Current-Gain-Bandwidth Product ($V_{CE} = 12.0\text{V}$, $I_E = -2.0\text{mA}$, $f = 100\text{MHz}$) ($V_{CE} = -12.0\text{V}$, $I_E = 2.0\text{mA}$, $f = 300\text{MHz}$)	NPN PNP	f_T	- -	180 140	- -	MHz
Output Capacitance ($V_{CE} = 12.0\text{V}$, $f = 1.0\text{MHz}$) ($V_{CB} = -12.0\text{V}$, $f = 1.0\text{MHz}$)	NPN PNP	C_{obo}	- -	2 4	3.5 5	P_f

Tr1 → 2SC2412K

Fig.1 Grounded emitter propagation characteristics

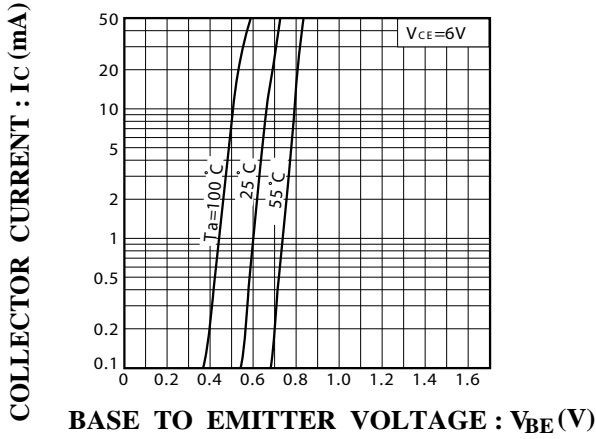


Fig.2 Grounded emitter output characteristics (1)

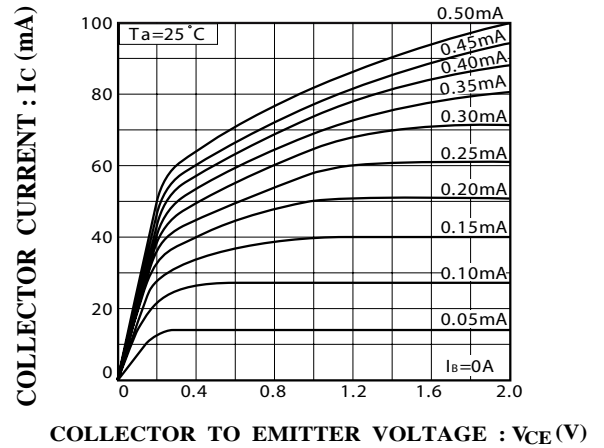


Fig.3 Grounded emitter output characteristics (1)

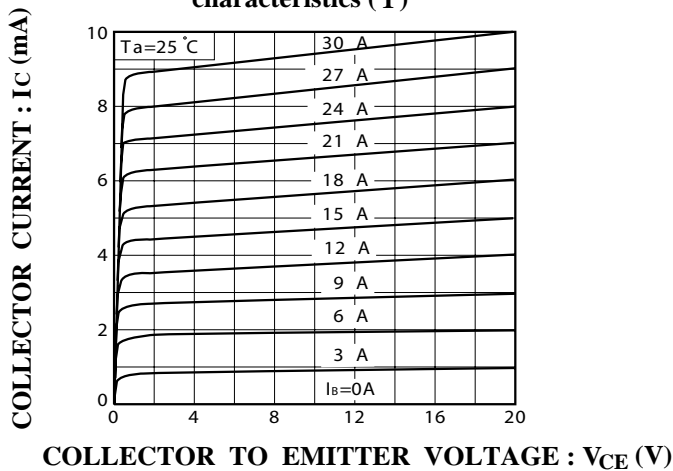


Fig.4 DC current gain vs. collector current (1)

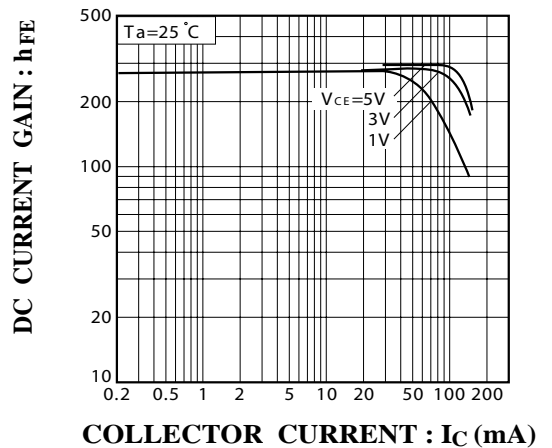


Fig.5 DC current gain vs. collector current (1)

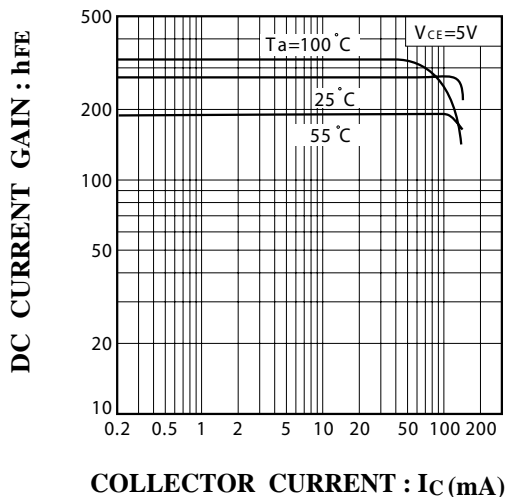
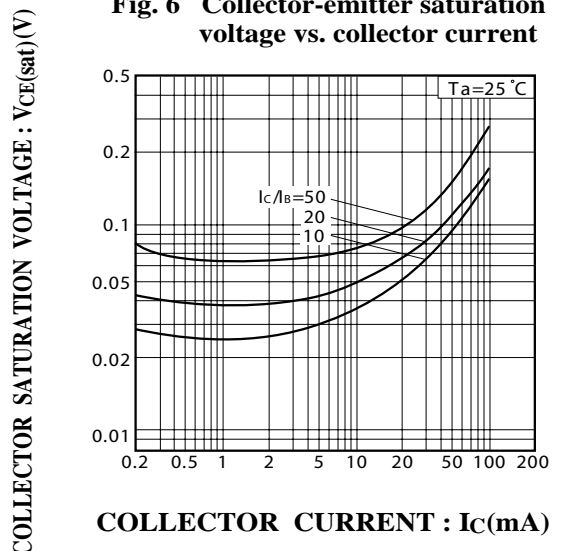
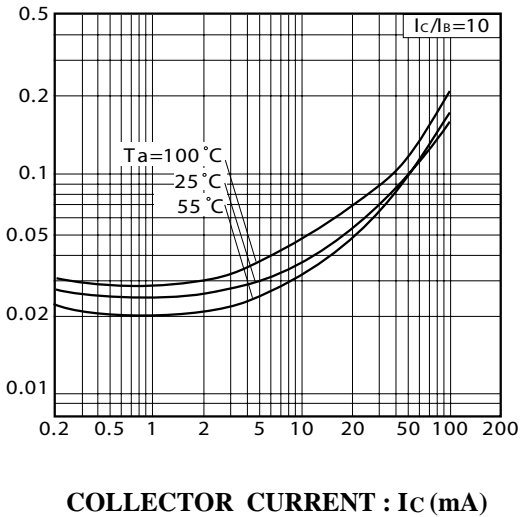


Fig.6 Collector-emitter saturation voltage vs. collector current



COLLECTOR SATURATION VOLTAGE : $V_{CE(sat)}$ (V)

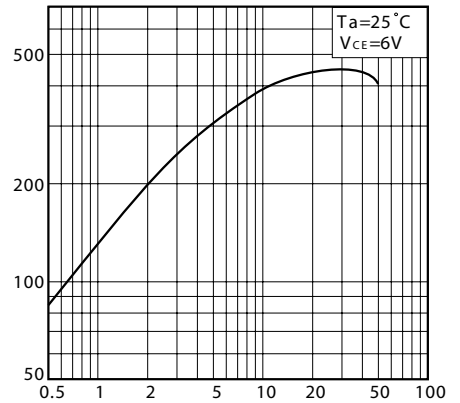
Fig.7 Collector-emitter saturation voltage vs. collector current (1)



COLLECTOR CURRENT : I_C (mA)

TRANSITION FREQUENCY : f_T (MHz)

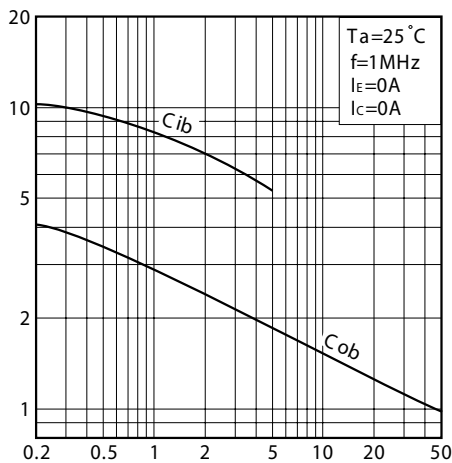
Fig.8 Gain bandwidth product vs. emitter current



EMITTER CURRENT : I_E (mA)

**Fig.9 Collector output capacitance vs. collector-base voltage
Emitter input capacitance vs. emitter-base voltage**

COLLECTOR OUTPUT CAPACITANCE : C_{ob} (pF)
EMITTER INPUT CAPACITANCE : C_{ib} (pF)



COLLECTOR TO BASE VOLTAGE : V_{CB} (V)
EMITTER TO BASE VOLTAGE : V_{EB} (V)

Tr2 → 2SA1037AK

Fig.10 Grounded emitter propagation characteristics

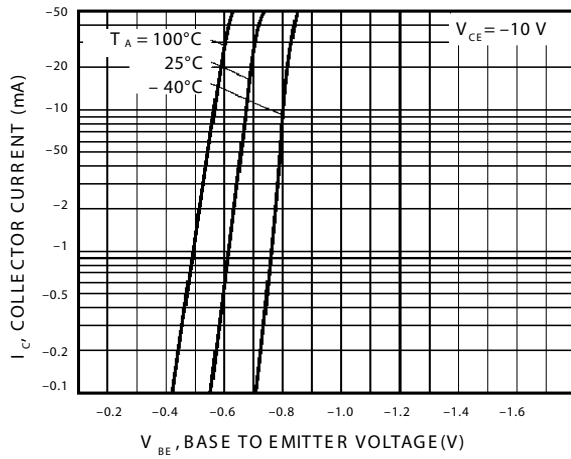


Fig.11 Grounded emitter output characteristics(1)

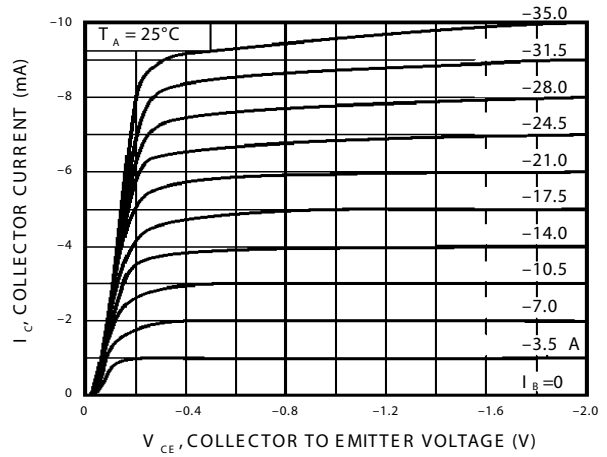


Fig.12 Grounded emitter output characteristics(1)

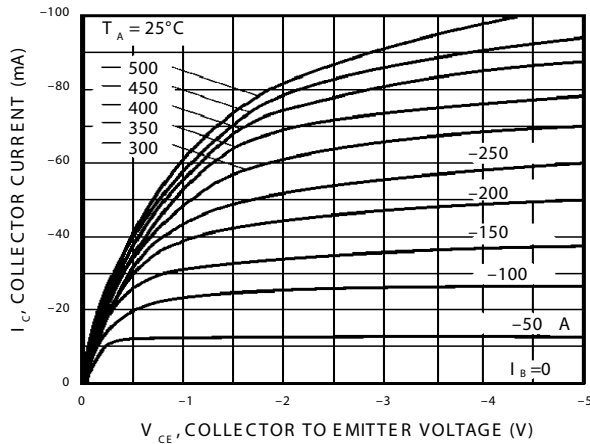


Fig.13 DC current gain vs. collector current (1)

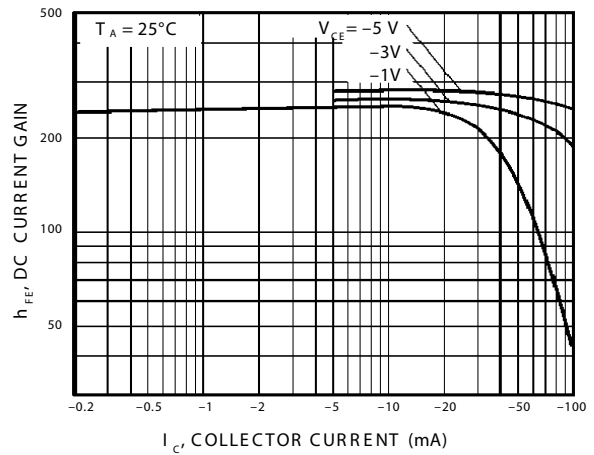


Fig.14 DC current gain vs. collector current (1)

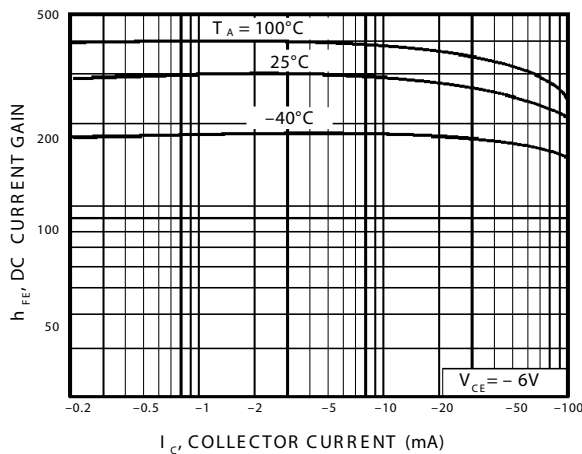


Fig.15 Collector-emitter saturation voltage vs. collector current (1)

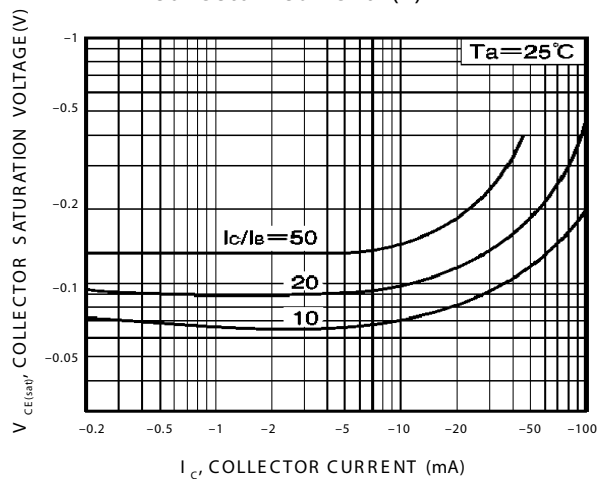


Fig.16 Collector-emitter saturation voltage vs. collector current (1)

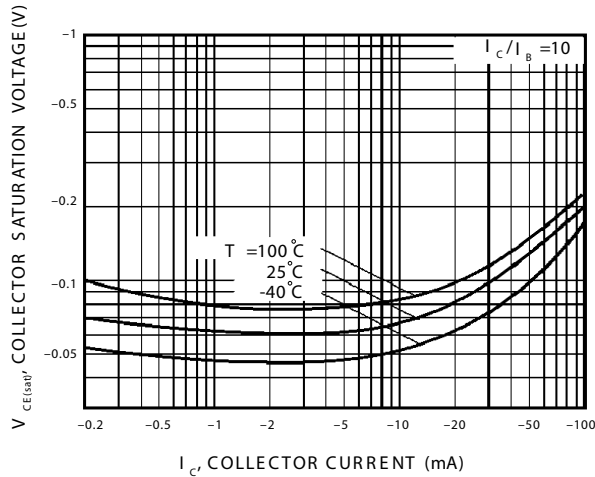


Fig.17 Gain bandwidth product vs. emitter current

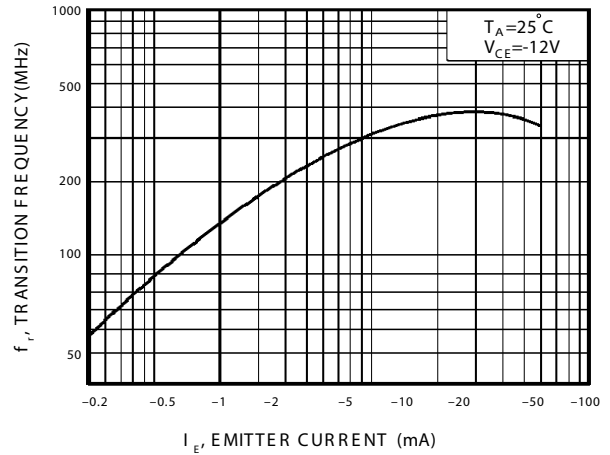
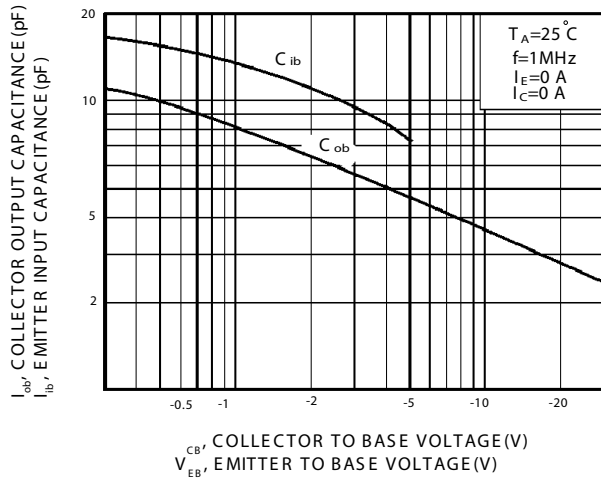
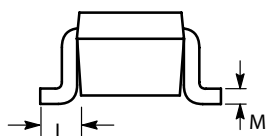
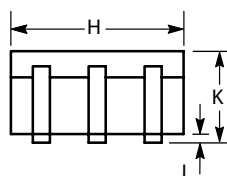
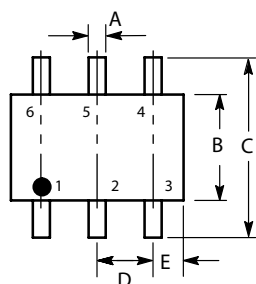


Fig. 18 Collector output capacitance vs. collector-base voltage
Emitter input capacitance vs. emitter-base voltage



SOT-363 Package Outline Dimensions

Unit:mm



SOT-363

Dim	Min	Max
A	0.10	0.30
B	1.15	1.35
C	2.00	2.20
D	0.65 REF	
E	0.30	0.40
H	1.80	2.20
J	-	0.10
K	0.80	1.10
L	0.25	0.40
M	0.10	0.25