



ON Semiconductor®

# ON Semiconductor DATA SHEET

## 2SB631, 631K/ 2SD600, 600K

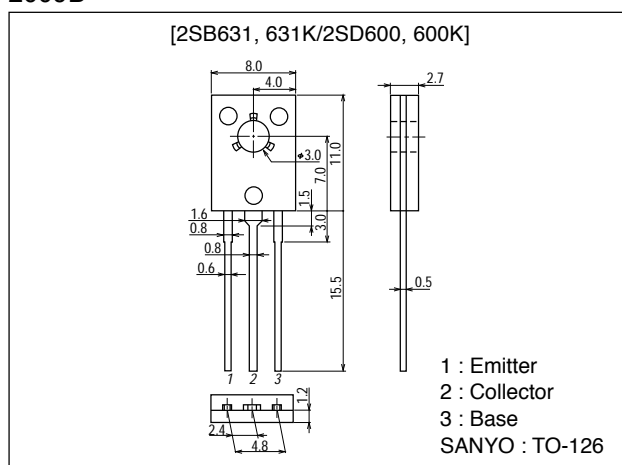
PNP/NPN Epitaxial Planar Silicon Transistors  
**100V/120V, 1A Low-Frequency  
Power Amplifier Applications**

### Features

- High breakdown voltage  $V_{CEO}$  100/120V, High current 1A.
- Low saturation voltage, excellent  $h_{FE}$  linearity.

### Package Dimensions

unit:mm  
2009B



( ) : 2SB631, 631K

### Specifications

Absolute Maximum Ratings at  $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	2SB631, D600	2SB631K, D600K	Unit
Collector-to-Base Voltage	$V_{CBO}$		(-)100	(-)120	V
Collector-to-Emitter Voltage	$V_{CEO}$		(-)100	(-)120	V
Emitter-to-Base Voltage	$V_{EBO}$			(-)5	V
Collector Current	$I_C$			(-)1	A
Collector Current (Pulse)	$I_{CP}$			(-)2	A
Collector Dissipation	$P_C$			1	W
		$T_c=25^\circ\text{C}$		8	W
Junction Temperature	$T_j$			150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$			-55 to +150	$^\circ\text{C}$

Electrical Characteristics at  $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=(-)10\mu\text{A}, I_E=0$	B631, D600	(-)100		V
			B631K, D600K	(-)120		V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=(-)1\text{mA}, R_{BE}=\infty$	B631, D600	(-)100		V
			B631K, D600K	(-)120		V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=(-)10\mu\text{A}, I_C=0$	(-)5		V	
Collector Cutoff Current	$I_{CBO}$	$V_{CB}=(-)50\text{V}, I_E=0$			(-)1	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=(-)4\text{V}, I_C=0$			(-)1	$\mu\text{A}$

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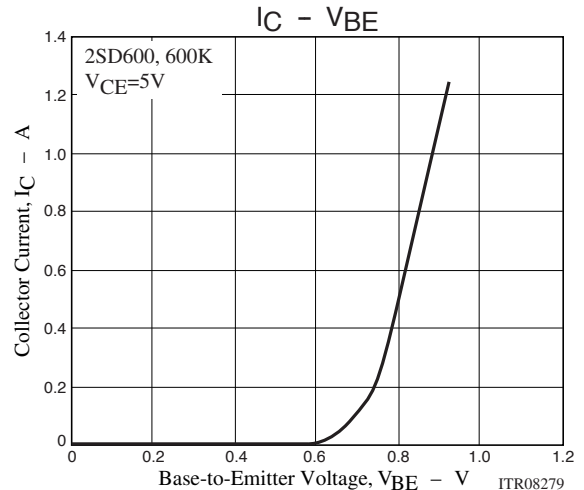
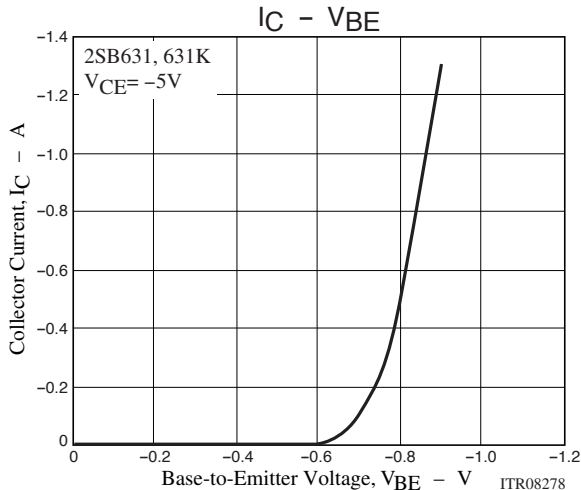
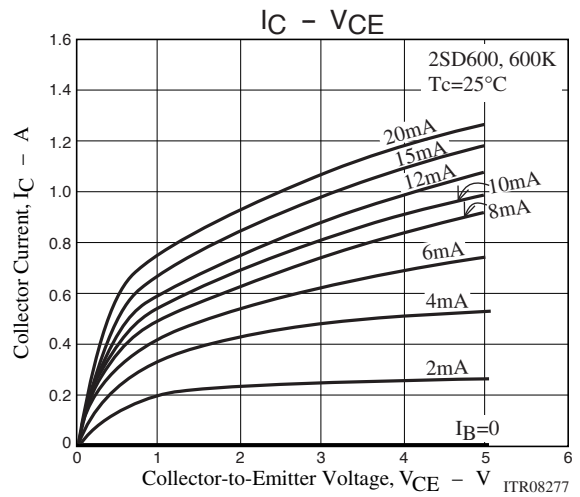
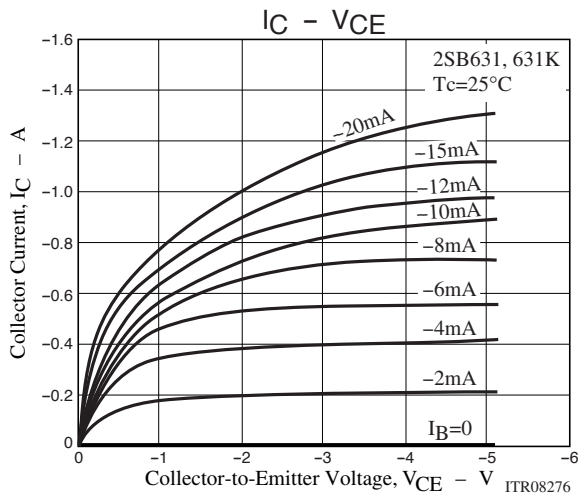
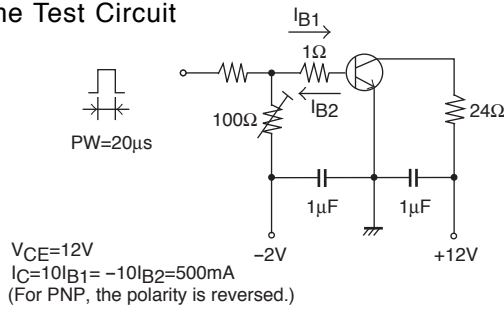
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
DC Current Gain	$h_{FE1}$	$V_{CE}=(-)5V, I_C=(-)50mA$	60*		320*	
	$h_{FE2}$	$V_{CE}=(-)5V, I_C=(-)500mA$	20			
Gain-Bandwidth Product	$f_T$	$V_{CE}=(-)10V, I_C=(-)50mA$		(110) 130		MHz MHz
Output Capacitance	$C_{ob}$	$V_{CB}=(-)10V, f=1MHz$		(30)20		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=(-)500mA, I_B=(-)50mA$		(-)0.15	(-)0.4	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=(-)500mA, I_B=(-)50mA$		(-)0.85	(-)1.2	V
Fall Time	$t_f$	See specified Test Circuit		(80)		ns
				100		ns
Turn-OFF Time	$t_{off}$	See specified Test Circuit		(100)		ns
				500		ns
Storage Time	$t_{stg}$	See specified Test Circuit		(600)		ns
				700		ns

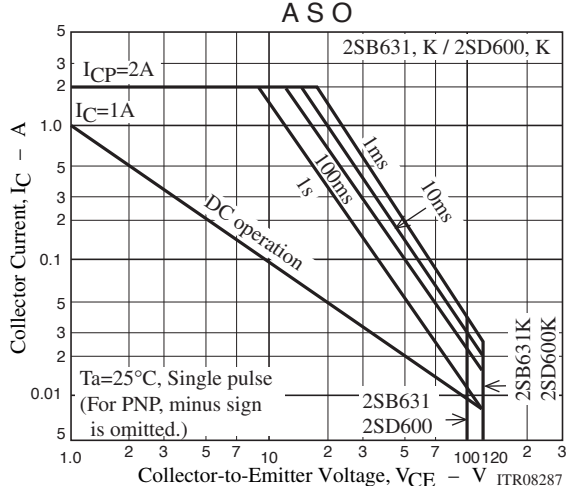
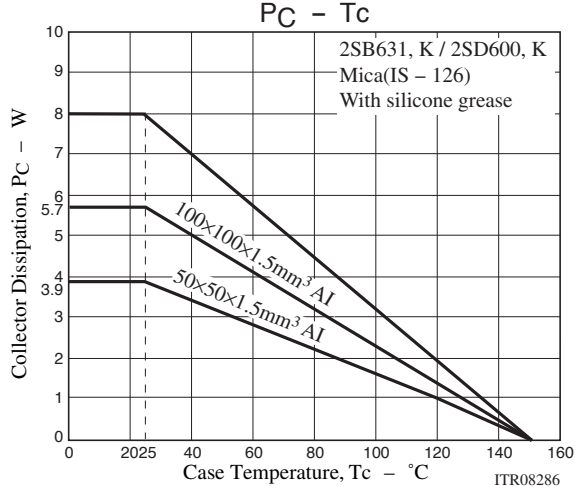
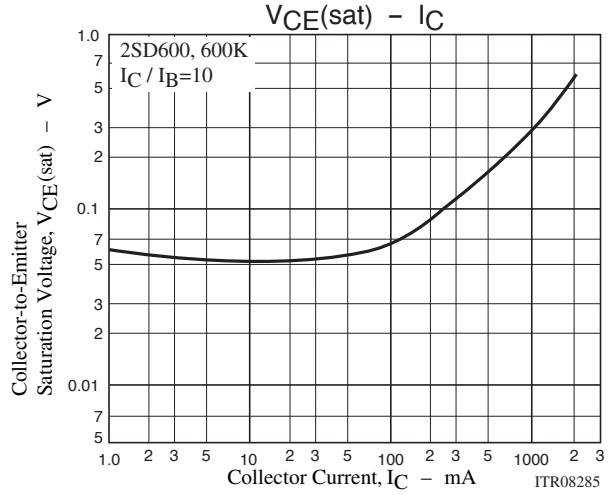
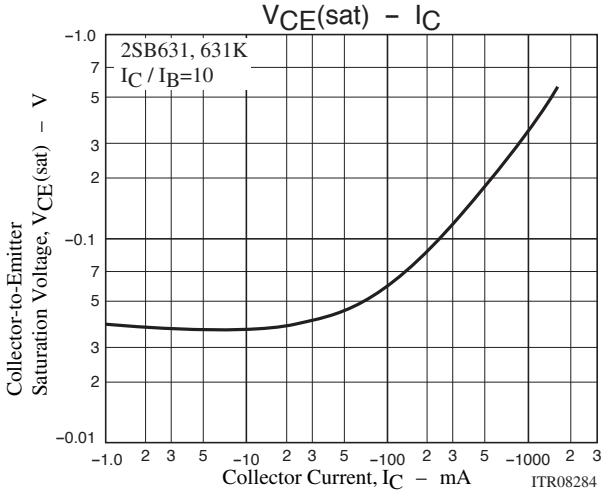
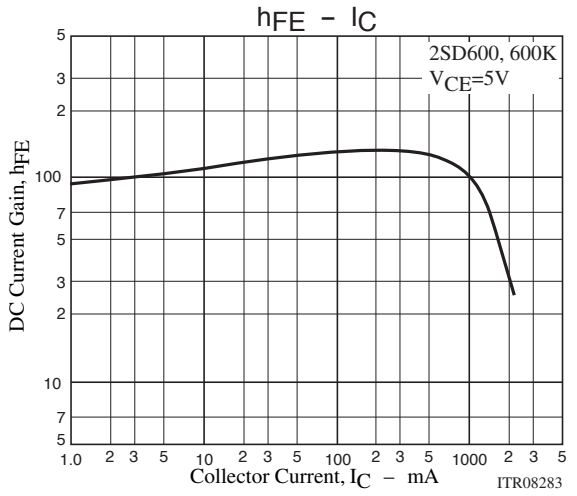
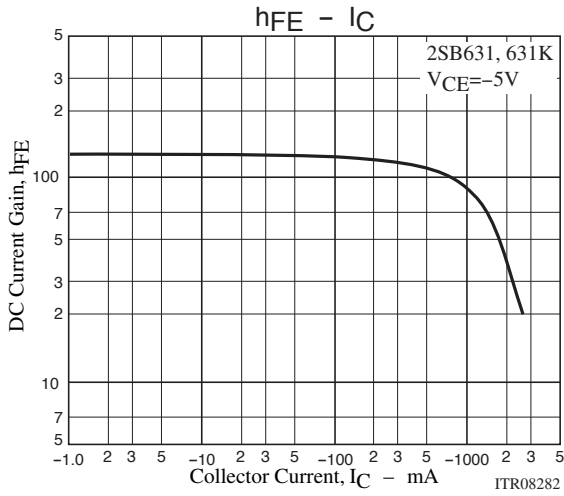
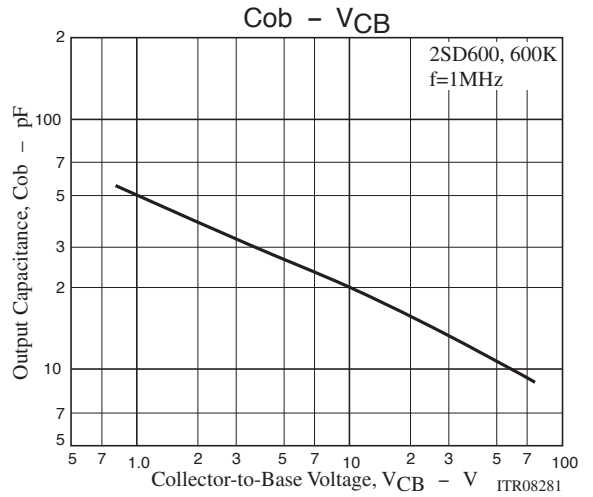
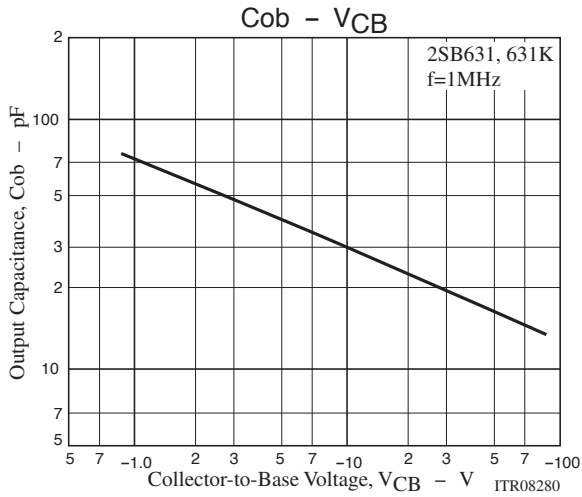
\* : The 2SB631/2SD600 are classified by 50mA  $h_{FE}$  as follows :

Rank	D	E	F
$h_{FE}$	60 to 120	100 to 200	160 to 320

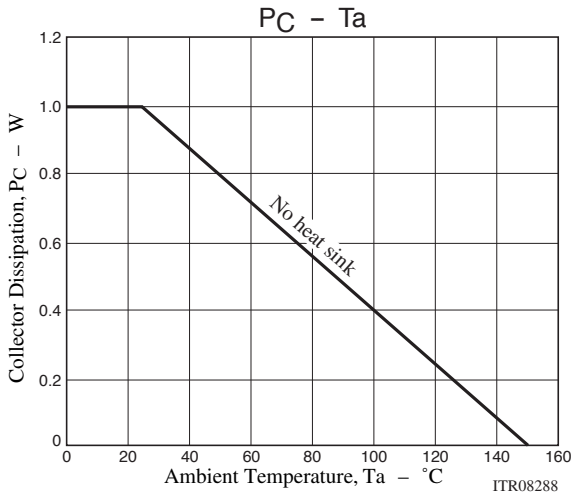
## Switching Time Test Circuit



# 2SB631, 631K/2SD600, 600K



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