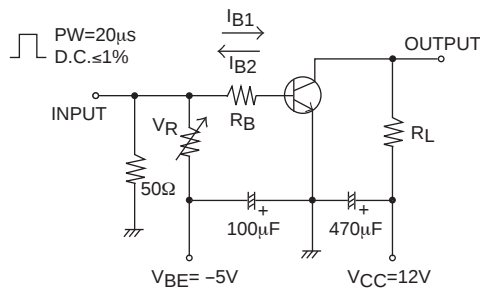


Electrical Characteristics at $T_a=25^{\circ}\text{C}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	$V_{CB}=(-)30\text{V}$, $I_E=0\text{A}$			$(-)0.1$	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB}=(-)4\text{V}$, $I_C=0\text{A}$			$(-)0.1$	μA
DC Current Gain	h_{FE}	$V_{CE}=(-)2\text{V}$, $I_C=(-)500\text{mA}$	200		560	
Gain-Bandwidth Product	f_T	$V_{CE}=(-)10\text{V}$, $I_C=(-)500\text{mA}$		(380)450		MHz
Output Capacitance	C_{ob}	$V_{CB}=(-)10\text{V}$, $f=1\text{MHz}$		(25)20		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)1}$	$I_C=(-)1.5\text{A}$, $I_B=(-)30\text{mA}$		$(-155)120$	$(-230)180$	mV
	$V_{CE(sat)2}$	$I_C=(-)1.5\text{A}$, $I_B=(-)75\text{mA}$		$(-)105$	$(-)155$	mV
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=(-)1.5\text{A}$, $I_B=(-)30\text{mA}$		$(-)0.83$	$(-)1.2$	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=(-)10\mu\text{A}$, $I_E=0\text{A}$	$(-30)40$			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=(-)1\text{mA}$, $R_{BE}=\infty$	$(-)30$			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=(-)10\mu\text{A}$, $I_C=0\text{A}$	$(-)5$			V
Turn-On Time	t_{on}	See specified Test Circuit.		(50)30		ns
Storage Time	t_{stg}			(270)300		ns
Fall Time	t_f			(25)15		ns

Switching Time Test Circuit

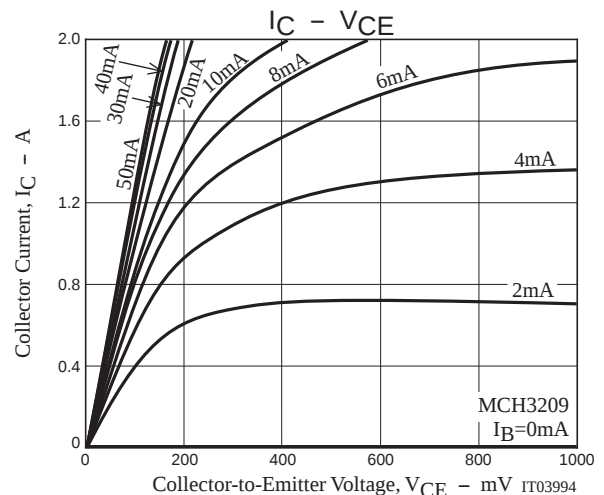
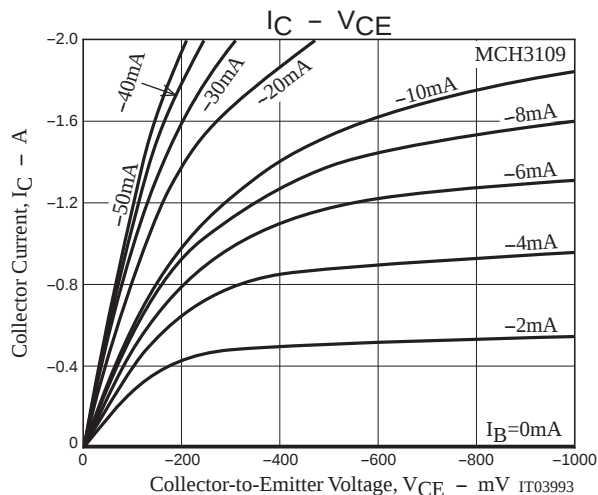


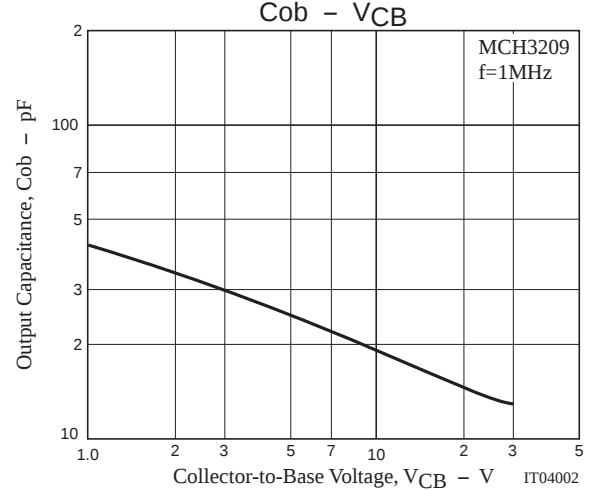
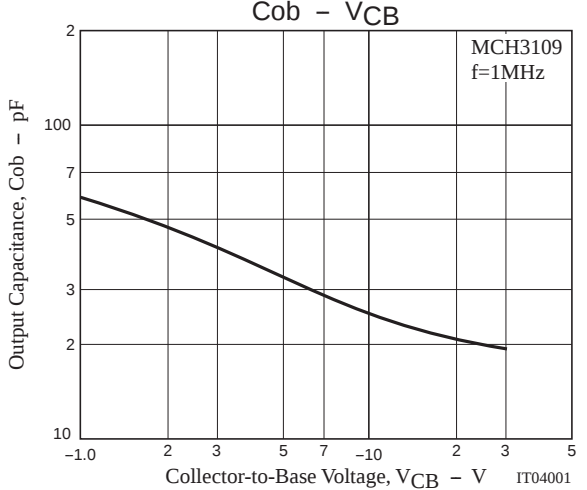
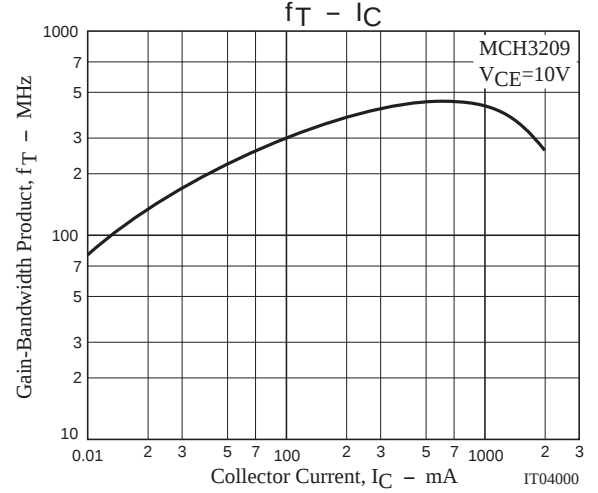
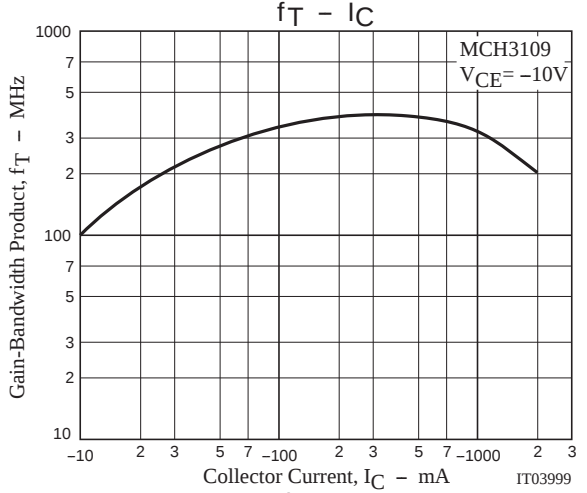
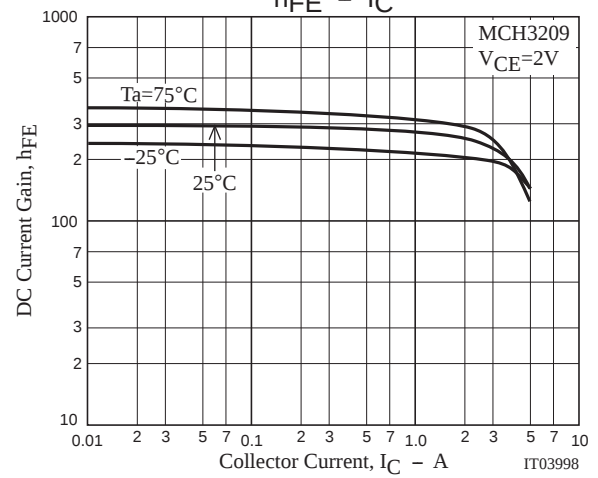
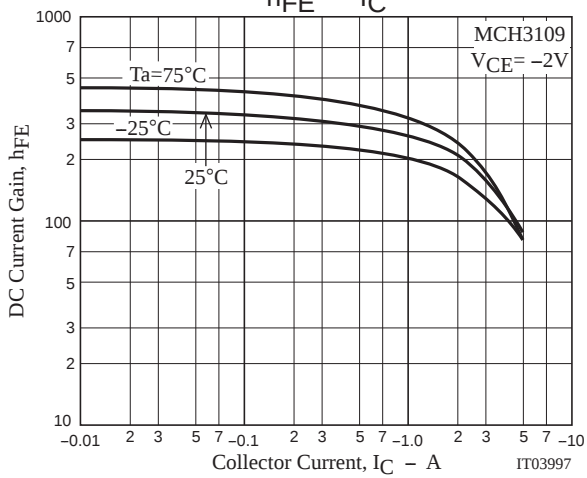
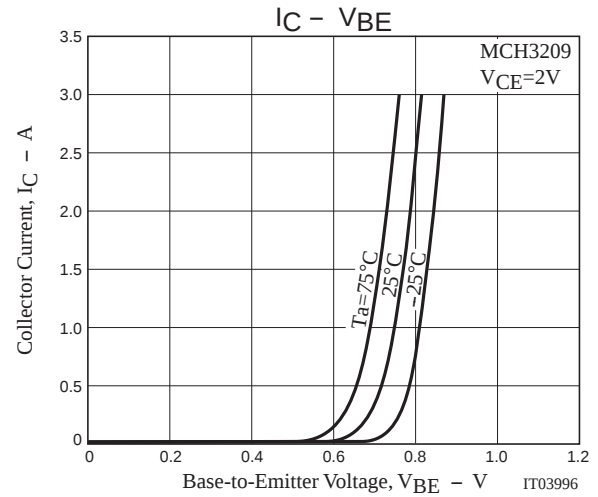
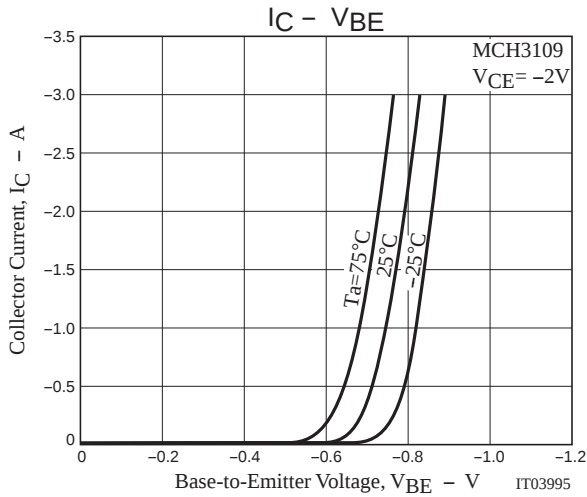
$$I_C = 20I_{B1} = -20I_{B2} = 500\text{mA}$$

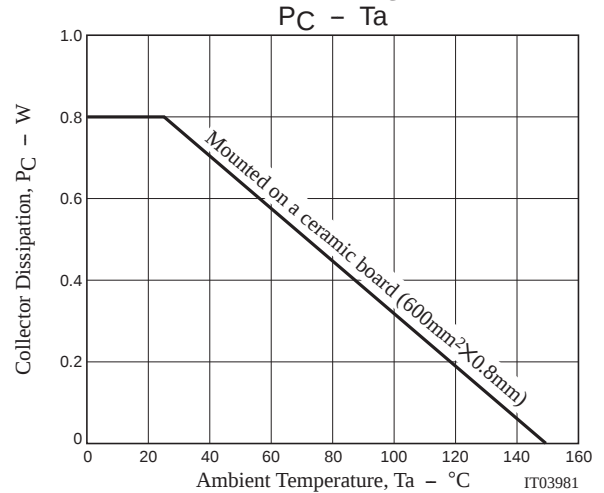
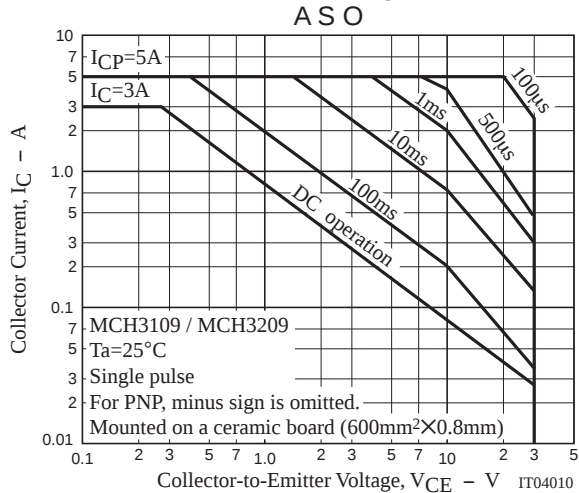
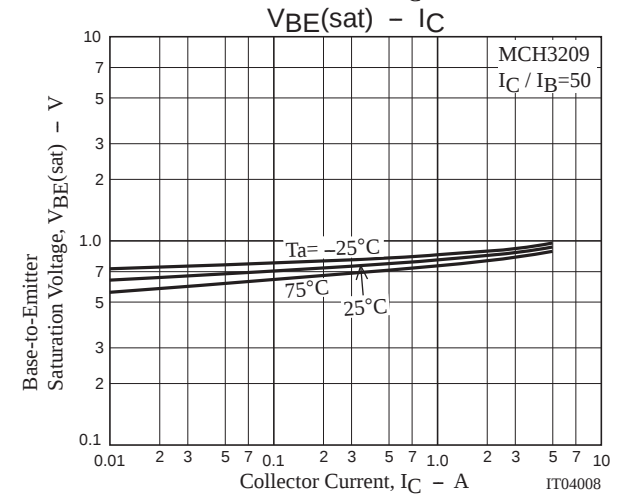
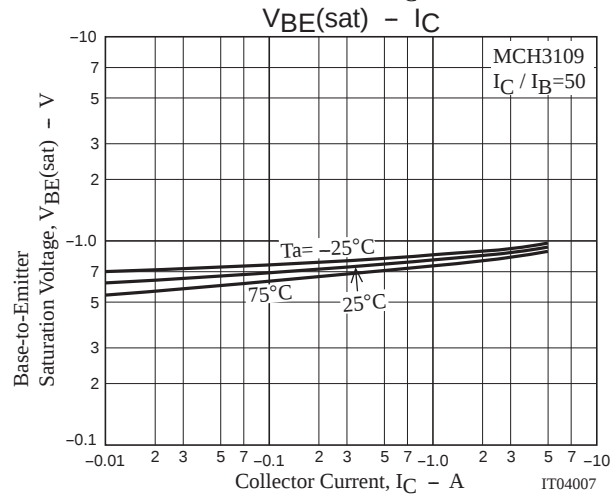
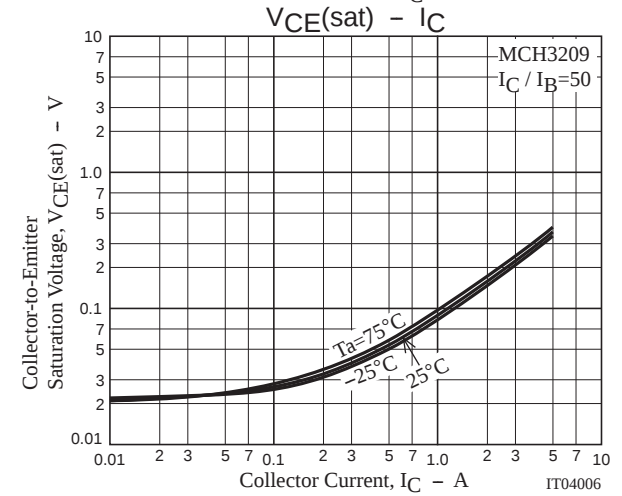
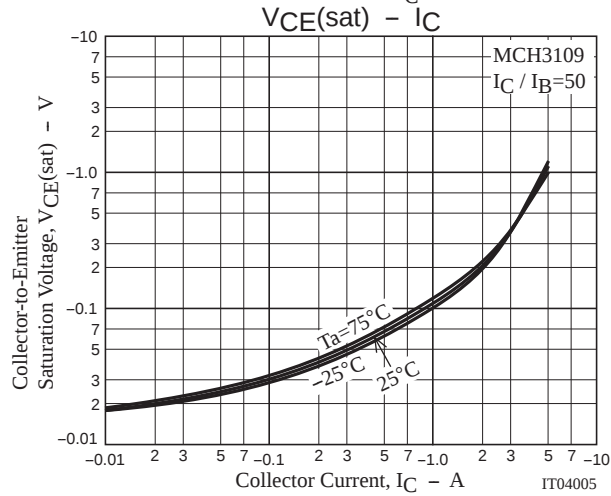
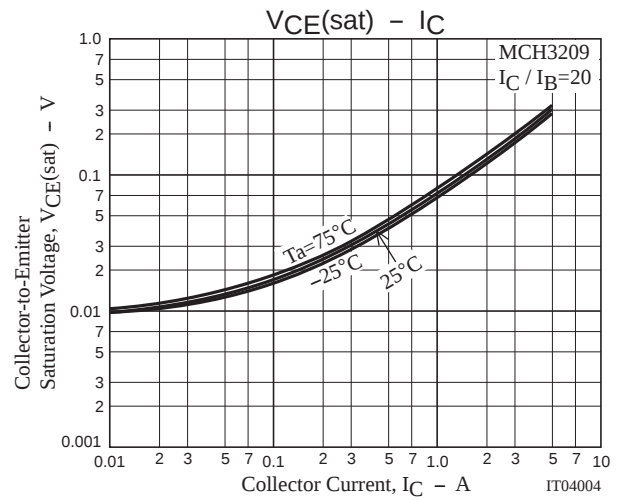
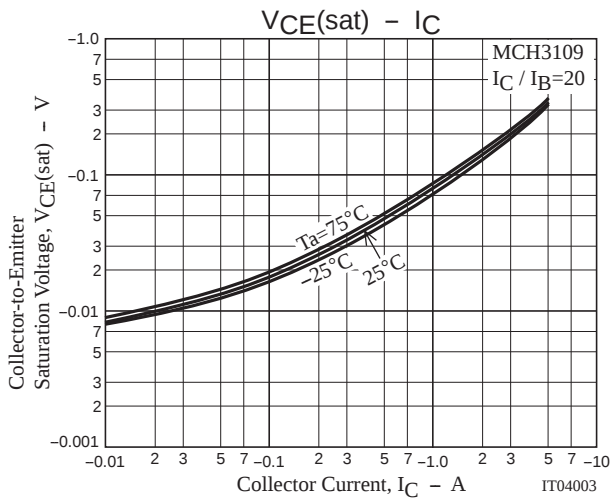
(For PNP, the polarity is reversed.)

Ordering Information

Device	Package	Shipping	memo
MCH3109-TL-E	MCPH3	3,000pcs./reel	Pb Free
MCH3209-TL-E	MCPH3	3,000pcs./reel	

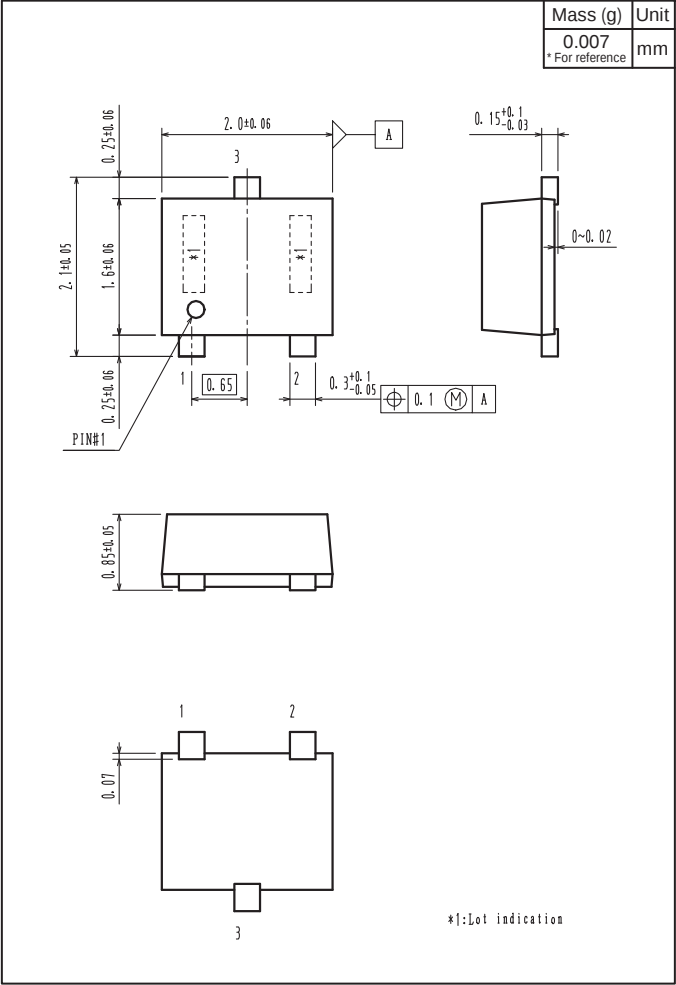




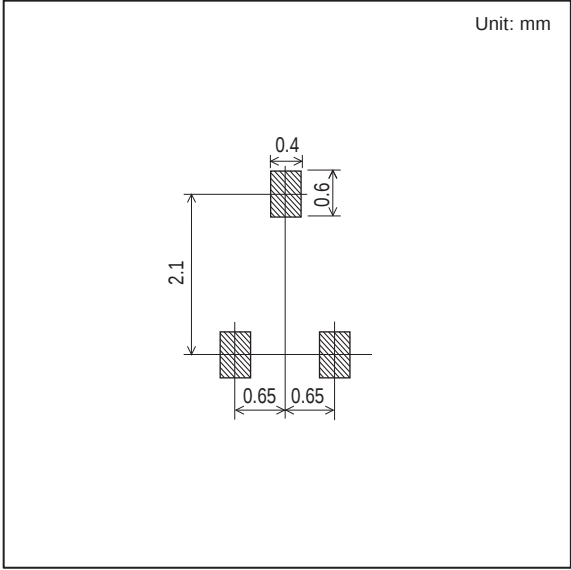


Outline Drawing

MCH3109-TL-E, MCH3209-TL-E



Land Pattern Example



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