ASY28
ASY29

GERMANIUM ALLOYED TRANSISTORS

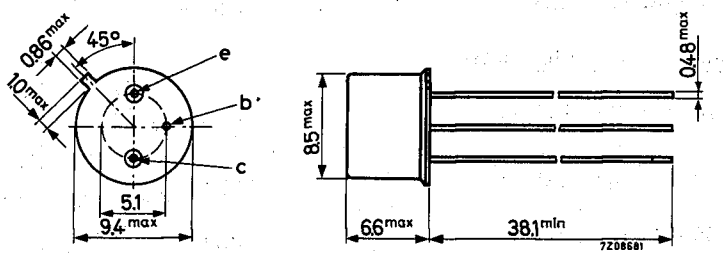
N-P-N transistors in a TO-5 metal envelope with the base connected to the case. These general purpose transistors are primarily intended for medium current medium speed computor logic applications.

RATINGS Limiting values according to the Absolute Maximum System as defined in IEC publication 134.

		ASY28	ASY29	
Voltages				
Collector-base voltage (open emitter)	V_{CBO}	max. 30	25	V
Collector-emitter voltage (open base)	V_{CEO}	max. 15	15	V
Collector-emitter voltage at $-V_{BE} = 0.2$ V	V_{CEX}	max. 25	20	V
Emitter-base voltage (open collector)	V_{EBO}	max. 20	20	V
Currents				
Collector current (d.c. or average over any 20 ms period)	I_C	max.	200	mA
Collector current (peak value)	I_{CM}	max.	300	mA
Power dissipation				
Total power dissipation up to $T_{amb} = 25$ °C	P_{tot}	max.	150	mW
Temperatures				
Storage temperature	T_{stg}	−65 to +100		°C
Junction temperature	T_j	max.	85	°C

MECHANICAL DATA Dimensions in mm

TO-5
Base connected to case



Accessories available: 56218, 56245, 56263.

ASY28
ASY29

THERMAL RESISTANCE

From junction to ambient in free air	$R_{th\ j\text{-}a}$	=	0.4	°C/mW
From junction to case	$R_{th\ j\text{-}c}$	=	0.2	°C/mW

CHARACTERISTICS $T_j = 25$ °C unless otherwise specified

			ASY28	ASY29	
Collector cut-off current					
$I_E = 0$; $V_{CB} = 30$ V	I_{CBO}	<	7		μA
$I_E = 0$; $V_{CB} = 25$ V	I_{CBO}	<		7	μA
$I_E = 0$; $V_{CB} = 30$ V; $T_j = 60$ °C	I_{CBO}	<	35		μA
$I_E = 0$; $V_{CB} = 25$ V; $T_j = 60$ °C	I_{CBO}	<		35	μA
Emitter cut-off current					
$I_C = 0$; $V_{EB} = 5$ V	I_{EBO}	<	3	3	μA
Currents at reverse biased emitter junction					
$V_{CE} = 25$ V; $-V_{BE} = 0.2$ V; $T_j = 60$ °C	I_{CEX}	<	35		μA
$V_{CE} = 20$ V; $-V_{BE} = 0.2$ V; $T_j = 60$ °C	I_{CEX}	<		35	μA
$V_{CE} = 20$ V; $-V_{BE} = 5$ V; $T_j = 60$ °C	$-I_{BEX}$	<	35	35	μA
Base-emitter voltage					
$I_C = 100$ mA; $V_{CE} = 1$ V	V_{BE}	<	0.65	0.55	V
$I_C = 300$ mA; $V_{CE} = 1$ V	V_{BE}	<	1.5	1.4	V
Collector-emitter saturation voltage					
$I_C = 10$ mA; $I_B = 0.33$ mA	$V_{CE\,sat}$	<	0.20		V
$I_C = 10$ mA; $I_B = 0.2$ mA	$V_{CE\,sat}$	<		0.20	V
$I_C = 50$ mA; $I_B = 2$ mA	$V_{CE\,sat}$	<	0.25		V
$I_C = 50$ mA; $I_B = 1.25$ mA	$V_{CE\,sat}$	<		0.25	V
Base-emitter saturation voltage					
$I_C = 10$ mA; $I_B = 0.4$ mA	$V_{BE\,sat}$	>	0.20		V
		<	0.37		V
$I_C = 10$ mA; $I_B = 0.25$ mA	$V_{BE\,sat}$	>		0.15	V
		<		0.32	V
$I_C = 50$ mA; $I_B = 2.4$ mA	$V_{BE\,sat}$	<	0.55		V
$I_C = 50$ mA; $I_B = 1.55$ mA	$V_{BE\,sat}$	<		0.45	V

CHARACTERISTICS (continued) T_j = 25 °C unless otherwise specified

			ASY28	ASY29	
Collector-emitter sustaining voltage					
I_C = 5 mA; I_B = 0	$V_{CEO\,sust}$	>	15	15	V
Punch through voltage	V_{pt}	>	25	20	V
Base-emitter floating voltage					
I_B = 0; V_{CE} = 25 V; T_j = 60 °C	$V_{BE\,fl}$	<	0.20		V
I_B = 0; V_{CE} = 20 V; T_j = 60 °C	$V_{BE\,fl}$	<		0.20	V
D.C. current gain					
I_C = 10 mA; V_{CE} = 1 V	h_{FE}	>	30	50	
		typ.	43	113	
I_C = 20 mA; V_{CE} = 1 V	h_{FE}	>	30	50	
		typ.	46	113	
		<	80	150	
I_C = 100 mA; V_{CE} = 1 V	h_{FE}	>	20	30	
		typ.	43	102	
I_C = 200 mA; V_{CE} = 1 V	h_{FE}	>	15	20	
		typ.	32	84	
Collector capacitance at f = 1 MHz					
$I_E = I_e$ = 0; V_{EB} = 5 V	C_c	typ.	11	11	pF
		<	16	16	pF
Emitter capacitance at f = 1 MHz					
$I_C = I_c$ = 0; V_{EB} = 5 V	C_e	typ.	7	6	pF
		<	13	13	pF
Transition frequency					
I_C = 3 mA; V_{CE} = 5 V	f_T	>	4	10	MHz
		typ.	14	20	MHz
h parameters at f = 1 kHz					
I_C = 2 mA; V_{CE} = 5 V					
Input impedance	h_{ie}	typ.	0.75	1.4	kΩ
Reverse voltage transfer ratio	h_{re}	typ.	3.5	5.0	10^{-4}
Small signal current gain	h_{fe}	typ.	50	90	
Output admittance	h_{oe}	typ.	45	70	$\mu\Omega^{-1}$

CHARACTERISTICS (continued) T_j = 25 °C unless otherwise specified

Switching characteristics			ASY28	ASY29	
Desaturation time constant I_C = 0; I_B = 1 mA	τ_s	<	1.4	1.4	µs
Current feed time constant I_{CM} = 50 mA; V_{CE} = 0.75 V	τ_c	<	2.2	2.2	µs
Voltage feed time constant I_{CM} = 1 mA; V_{CE} = 5 V	τ_v	<	0.2	0.2	µs
Switching times (See test circuit)					
delay time	t_d	typ. <	50 90	45 75	ns ns
rise time	t_r	typ. <	175 400	140 300	ns ns
storage time	t_s	typ. <	450 700	500 800	ns ns
fall time	t_f	typ. <	325 620	300 520	ns ns

Test circuit: