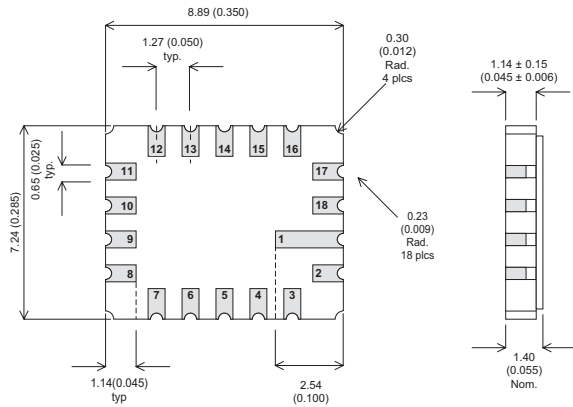
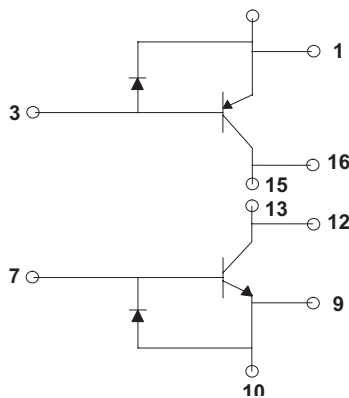


Mechanical Data
Dimensions in mm (inches)

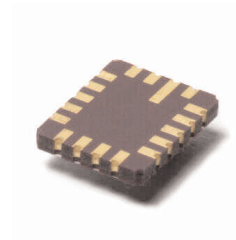


Case Style LCC6
Underside View



Circuit Diagram

MULTI-CHIP ARRAY



FEATURES

- Silicon NPN & PNP Epitaxial Transistors
- Silicon Schottky Diode
- Hermetic Ceramic Surface Mount Package
- Small Size, Low Weight
- High Reliability
- Various Screening Options

ABSOLUTE MAXIMUM RATINGS

P_D	Total Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	1.15W 11.5mW/ $^\circ\text{C}$
T_A	Operating Temperature Range	-55 to +125 $^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to +150 $^\circ\text{C}$
T_{SOL}	Soldering Temperature @ $\Delta t = 10\text{secs}$	230 $^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	87 $^\circ\text{C}/\text{w}$

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Document Number 2704

Issue 1

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise stated)

PNP TRANSISTOR

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{(BR)CBO}^*$ Collector – Base Breakdown Voltage	$I_C = 10\mu\text{A}$ $I_E = 0$	-12			V
$V_{(BR)CEO}$ Collector – Emitter Breakdown Voltage	$I_C = 10\text{mA}$ $I_B = 0$	-12			
$V_{(BR)EBO}$ Emitter – Base Breakdown Voltage	$I_E = 10\mu\text{A}$ $I_C = 0$	-4			
I_{CBO} Collector Cut-off Current	$V_{CB} = -6\text{V}$ $T_{amb} = 125^\circ\text{C}$			-10	nA
I_{CES} Collector Cut-off Current	$V_{BE} = 0$ $V_{CE} = -6\text{V}$			-80	
$V_{CE(sat)}$ Collector – Emitter Saturation Voltage	$I_C = -10\text{mA}$ $I_B = -1\text{mA}$			-0.15	V
	$I_C = -30\text{mA}$ $I_B = -3\text{mA}$			-0.20	
	$I_C = -100\text{mA}$ $I_B = -10\text{mA}$			-0.50	
$V_{BE(sat)}$ Base – Emitter On Voltage	$I_C = -10\text{mA}$ $I_B = -1\text{mA}$	-0.78		-0.98	V
	$I_C = -30\text{mA}$ $I_B = -3\text{mA}$	-0.85		-1.2.	
	$I_C = -100\text{mA}$ $I_B = -10\text{mA}$			-1.7	
h_{FE} DC Current Gain	$I_C = -10\text{mA}$ $V_{CE} = -0.3\text{V}$	30			—
	$I_C = -30\text{mA}$ $V_{CE} = -0.5\text{V}$	40		150	
	$I_C = -100\text{mA}$ $V_{CE} = -1\text{V}$	25			
	$I_C = -30\text{mA}$ $V_{CE} = -0.5\text{V}$ $T_{amb} = 125^\circ\text{C}$	17			
f_T Current Gain Bandwidth Product	$V_{CE} = -10\text{V}$ $f = 100\text{MHz}$ $I_C = -30\text{mA}$	400			MHz
C_{ebo} Emitter – Base – Capacitance	$V_{EB} = -5\text{V}$ $I_C = 0$ $f = 1\text{MHz}$			6	pF
C_{cbo} Collector – Base – Capacitance	$V_{CB} = -5\text{V}$ $I_C = 0$ $f = 1\text{MHz}$			6	pF
t_{on} Turn on Time	$I_C = -30\text{mA}$ $V_{CE} = -2\text{V}$ $I_{B2} = -1.5\text{mA}$			60	ns
t_{off} Turn off Time	$I_C = -30\text{mA}$ $V_{CE} = -2\text{V}$ $I_{B1} = I_{B2} = -1.5\text{mA}$			9	ns

* Pulse Test: $t_p \leq 300\mu\text{s}$, $\delta \leq 2\%$.

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise stated)

NPN TRANSISTOR

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{(BR)CEO^*}$ Collector – Emitter Breakdown Voltage	$I_C = 10\text{mA}$	15			V
$V_{(BR)CBO}$ Collector – Base Breakdown Voltage	$I_C = 10\mu\text{A}$	40			V
$V_{(BR)EBO}$ Emitter – Base Breakdown Voltage	$I_E = 10\mu\text{A}$	4.5			V
I_{CES} Collector – Emitter Cut-off Current	$V_{CE} = 20\text{V}$			0.40	μA
	$V_{CE} = 10\text{V}$			0.30	
	$T_A = +150^\circ\text{C}$			30	
I_{CBO} Collector – Base Cut-off Current	$V_{CB} = 20\text{V}$			0.20	μA
	$T_A = +125^\circ\text{C}$			30	
I_{EBO} Emitter – Base Cut-off Current	$V_{EB} = 4\text{V}$			0.25	μA
$V_{CE(sat)}$ Collector – Emitter Saturation Voltage	$I_C = 10\text{mA}$ $I_B = 1\text{mA}$			0.20	V
	$T_A = +150^\circ\text{C}$			0.30	
	$I_C = 30\text{mA}$ $I_B = 3\text{mA}$			0.25	
$V_{BE(sat)}$ Base – Emitter Saturation Voltage	$I_C = 10\text{mA}$ $I_B = 1\text{mA}$			0.70	V
	$T_A = +25^\circ\text{C}$			0.85	
	$T_A = +150^\circ\text{C}$			0.59	
	$T_A = -55^\circ\text{C}$			1.02	
	$I_C = 30\text{mA}$ $I_B = 3\text{mA}$			0.90	
h_{FE^*} Current Gain	$I_C = 10\text{mA}$ $V_{CE} = 0.35\text{V}$	40		120	—
	$I_C = 30\text{mA}$ $V_{CE} = 0.40\text{V}$	30		120	
	$I_C = 10\text{mA}$ $V_{CE} = 1\text{V}$	40		120	
	$T_A = -55^\circ\text{C}$	20			
	$I_C = 100\text{mA}$ $V_{CE} = 1\text{V}$	20		120	
$ h_{fe} $ Magnitude of h_{fe}	$I_C = 10\text{mA}$ $V_{CE} = 10\text{V}$ $f = 100\text{MHz}$	5		10	—
C_{ob} Output Capacitance	$V_{CB} = 5\text{V}$ $I_E = 0$ $f = 100\text{kHz to } 1\text{MHz}$			4	pF
C_{ib} Input Capacitance	$V_{EB} = 0.5\text{V}$ $I_C = 0$ $f = 100\text{kHz to } 1\text{MHz}$			5	
t_s Storage Time	$I_C = 10\text{mA}$ $I_{B1} = -I_{B2} = 10\text{mA}$			13	ns
t_{on} Turn-On Time	$I_C = 10\text{mA}$			12	ns
t_{off} Turn-Off Time	$I_{B1} = 3\text{mA}$ $I_{B2} = -1.5\text{mA}$			18	

* Pulse Test: $t_p \leq 300\mu\text{s}$, $\delta \leq 2\%$.

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SCHOTTKY DIODE

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_R^* Reverse Current	$T_{\text{amb}} = 25^\circ\text{C}$ $V_R = 50\text{V}$			0.2	μA
V_F^* Forward Voltage	$T_{\text{amb}} = 25^\circ\text{C}$ $I_F = 1\text{mA}$			0.41	V
	$T_{\text{amb}} = 25^\circ\text{C}$ $I_F = 15\text{mA}$			1	
$V_{(\text{BR})}$ Breakdown Voltage	$T_{\text{amb}} = 25^\circ\text{C}$ $I_R = 10\mu\text{A}$	70			V
C Capacitance	$T_{\text{amb}} = 25^\circ\text{C}$ $V_R = 0\text{V}$ $f = 1\text{MHz}$			2	pF
t Effective Minority Carrier Lifetime	$T_{\text{amb}} = 25^\circ\text{C}$ $I_F = 5\text{mA}$			100	ps

* Pulse test $\leq 300\mu\text{s}$, $\delta \leq 2\%$