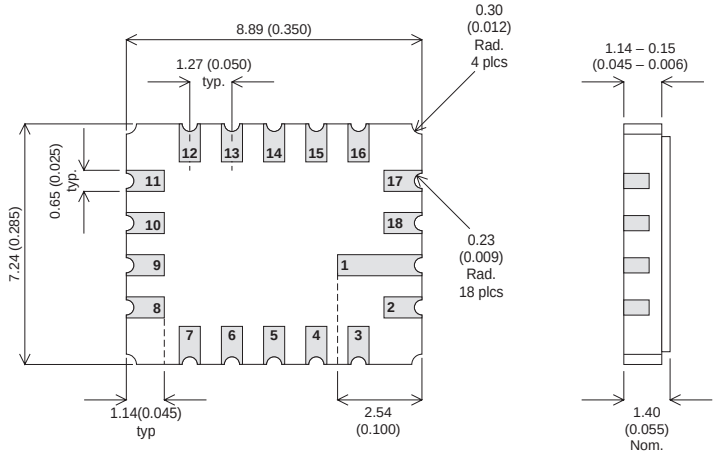
2N2222AQCSM

QUAD HIGH SPEED, MEDIUM POWER NPN SWITCHING TRANSISTOR IN A HERMETICALLY SEALED CERAMIC SURFACE MOUNT PACKAGE FOR HIGH RELIABILITY APPLICATIONS

MECHANICAL DATA
Dimensions in mm (inches)



LCC6 PACKAGE
Underside View

1 – Base 1	7.– Collector 2	10.– Base 3	16.– Collector 4
2 – Emitter 1	8.– Emitter 2	11 – Emitter 3	17.– Emitter 4
3 – Collector 1	9 – Base 2	12 – Collector 3	18.– Base 4

4,5,6,13,14,15 – n/c

FEATURES

- **QUAD SILICON PLANAR EPITAXIAL NPN TRANSISTORS**
- **HERMETIC CERAMIC SURFACE MOUNT PACKAGE**
- **CECC SCREENING OPTIONS**
- **SPACE QUALITY LEVELS OPTIONS**
- **HIGH SPEED SATURATED SWITCHING**

APPLICATIONS:

Hermetically sealed quad surface mount version of the popular 2N2222A for high reliability / space applications requiring small size and low weight devices.

ABSOLUTE MAXIMUM RATINGS PER SIDE (T_C = 25°C unless otherwise stated)

	PER DEVICE	
V_{CBO}	Collector – Base Voltage	75V
V_{CEO}	Collector – Emitter Voltage (I_B = 0)	40V
V_{EBO}	Emitter – Base Voltage (I_B = 0)	6V
I_C	Collector Current	600mA
P_D	Device Dissipation (T_A 25°C)	500mW
P_D	Derate above 50°C	2.0mW / °C
	TOTAL DEVICE	
P_D	Total Device Dissipation (T_A 25°C)	2.0 W
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	60°C/W
$R_{\theta JC}$	Thermal Resistance Junction to Case	30°C/W
T_{STG}	Storage Temperature	–55 to 200°C

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SEME LAB

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ELECTRICAL CHARACTERISTICS PER DEVICE (T_C = 25°C unless otherwise stated)

	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
$V_{CEO(sus)}$*	Collector – Emitter Sustaining Voltage	I_C = 10mA		40			V
$V_{(BR)CBO}$*	Collector – Base Breakdown Voltage	I_C = 10µA		75			V
$V_{(BR)EBO}$*	Emitter – Base Breakdown Voltage	I_E = 10µA	I_C = 0	6			V
I_{CEX}*	Collector Cut-off Current (I_C = 0)	I_B = 0	V_{CE} = 60V			10	nA
I_{CBO}*	Collector – Base Cut-off Current	I_E = 0	V_{CB} = 60V			10	nA
		T_C = 125°C				10	µA
I_{EBO}*	Emitter Cut-off Current (I_C = 0)	I_C = 0	V_{EB} = 3V (off)			10	nA
I_{BL}*	Base Current	V_{CE} = 60V	V_{EB} = 3V (off)			20	nA
$V_{CE(sat)}$*	Collector – Emitter Saturation Voltage	I_C = 150mA	I_B = 15mA			0.3	V
		I_C = 500mA	I_B = 50mA			1	
$V_{BE(sat)}$*	Base – Emitter Saturation Voltage	I_C = 150mA	I_B = 15mA	0.6		1.2	V
		I_C = 500mA	I_C = 50mA			2	
h_{FE}*	DC Current Gain	I_C = 0.1mA	V_{CE} = 10V	35			—
		I_C = 1mA	V_{CE} = 10V	50			
		I_C = 10mA	V_{CE} = 10V	75			
	T_A = –55°C	I_C = 10mA	V_{CE} = 10V	35			
		I_C = 150mA	V_{CE} = 10V	100		300	
		I_C = 150mA	V_{CE} = 1V	50			
		I_C = 500mA	V_{CE} = 10V	40			

* Pulse test t_p = 300µs , $\delta \leq 2\%$

DYNAMIC CHARACTERISTICS PER DEVICE (T_C = 25°C unless otherwise stated)

	Parameter	Test Conditions			Min.	Typ.	Max.	Unit
f_T	Transition Frequency	I_C = 20mA	V_{CE} = 20V	f = 100MHz	300			MHz
C_{ob}	Output Capacitance	V_{CB} = 10V	I_E = 0	f = 1.0MHz			8	pF
C_{ib}	Input Capacitance	V_{BE} = 0.5V	I_C = 0	f = 1.0MHz			30	pF
h_{fe}	Small Signal Current Gain	I_C = 1mA	V_{CE} = 10V	f = 1kHz	50		300	
		I_C = 10mA	V_{CE} = 10V	f = 1kHz	75		375	

SWITCHING CHARACTERISTICS PER DEVICE(RESISTIVE LOAD)

(T_C = 25°C unless otherwise stated)

	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
t_d	Delay Time	V_{CC} = 30V	V_{BE} = 0.5V (off)			10	ns
t_r	Rise Time	I_{C1} = 150mA	I_{B1} = 15mA			25	ns
t_s	Storage Time	V_{CC} = 30V	I_C = 150mA			225	ns
t_f	Fall Time	I_{B1} = I_{B2} = 15mA				60	ns

f_T is defined as the frequency at which h_{FE} extrapolates to unity.

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