

SILICON PLANAR EPITAXIAL NPN TRANSISTOR

2N3439CSM4 / 2N3439CSM4R 2N3440CSM4 / 2N3440CSM4R

- High Voltage
- Hermetic Ceramic Surface Mount Package.
- Ideally suited for drivers in high-voltage low current inverters, switching and series regulators.
- Screening Options Available



ABSOLUTE MAXIMUM RATINGS (T_A = 25°C unless otherwise stated)

Symbols	Parameters	2N3439	2N3440
V _{CB0}	Collector – Base Voltage	450V	300V
V _{CEO}	Collector – Emitter Voltage	350V	250V
V _{EBO}	Emitter – Base Voltage	7V	
I _C	Collector Current – Continuous	1.0A	
I _B	Base Current	0.5A	
P _D	Total Power Dissipation at T _A = 25°C	800mW	
	Derate Above 25°C	4.6mW/°C	
P _D	Total Power Dissipation at T _{SP} = 25°C	1.5W	
	Derate Above 25°C	8.6mW/°C	
T _J	Junction Temperature Range	-65 to +200°C	
T _{stg}	Storage Temperature Range	-65 to +200°C	

THERMAL PROPERTIES

Symbols	Parameters	Max.	Units
R _{θJA}	Thermal Resistance, Junction To Ambient	218.7	°C/W
R _{θJSP}	Thermal Resistance, Junction To Solder Pads	116.7	°C/W

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2N3440CSM4 / 2N3440CSM4R

2N3439CSM4, 2N3439CSM4R (T _A = 25°C unless otherwise stated)							
ELECTRICAL CHARACTERISTICS							
Symbols	Parameters	Test Conditions		Min.	Typ	Max.	Units
I _{CEO}	Collector Cut-Off Current	V _{CE} = 300V	I _B = 0			2	μA
I _{CBO}	Collector Cut-Off Current	V _{CB} = 450V	I _E = 0			5	
		V _{CB} = 360V	I _E = 0			2	
			T _A = 150°C			10	
I _{CEX}	Collector Cut-Off Current	V _{CE} = 450V	V _{BE} = -1.5V			5	
I _{EBO}	Emitter Cut-Off Current	V _{EB} = 7V	I _C = 0			10	
V _{CE(sat)} ⁽¹⁾	Collector-Emitter Saturation Voltage	I _C = 50mA	I _B = 4mA			0.5	V
V _{BE(sat)} ⁽¹⁾	Base-Emitter Saturation Voltage	I _C = 50mA	I _B = 4mA			1.3	
h _{FE} ⁽¹⁾	Forward-current transfer ratio	I _C = 0.2mA	V _{CE} = 10V	10			
		I _C = 2mA	V _{CE} = 10V	30			
		I _C = 20mA	V _{CE} = 10V	40		160	
			T _A = -55°C	15			
DYNAMIC CHARACTERISTICS							
h _{fe}	Small signal forward-current transfer ratio	I _C = 5mA f = 1.0KHz	V _{CE} = 10V	25			
h _{fe}	Magnitude of Common-Emitter Small-Signal Short-Circuit forward Current, Transfer Ratio	I _C = 10mA f = 5MHz	V _{CE} = 10V	3		15	MHz
C _{obo}	Output Capacitance	V _{CB} = 10V f = 1.0MHz	I _E = 0			10	pF
C _{ibo}	Input Capacitance	V _{EB} = 5V f = 1.0MHz	I _C = 0			75	pF
t _{on}	Turn-On Time	I _C = 20mA I _{B1} = 2mA	V _{CC} = 200V			1.0	μs
t _{off}	Turn-Off Time	I _C = 20mA I _{B1} = - I _{B2} = 2mA	V _{CC} = 200V			10	

Notes

(1) Pulse Width $\leq 380\mu\text{s}$, $\delta \leq 2\%$

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ELECTRICAL CHARACTERISTICS							
Symbols	Parameters	Test Conditions		Min.	Typ	Max.	Units
I _{CEO}	Collector Cut-Off Current	V _{CE} = 200V	I _B = 0			2	μA
I _{CBO}	Collector Cut-Off Current	V _{CB} = 300V	I _E = 0			5	
		V _{CB} = 250V	I _E = 0			2	
			T _A = 150°C			10	
I _{CEX}	Collector Cut-Off Current	V _{CE} = 300V	V _{BE} = -1.5V			5	
I _{EBO}	Emitter Cut-Off Current	V _{EB} = 7V	I _C = 0			10	
V _{CE(sat)} ⁽¹⁾	Collector-Emitter Saturation Voltage	I _C = 50mA	I _B = 4mA			0.5	V
V _{BE(sat)} ⁽¹⁾	Base-Emitter Saturation Voltage	I _C = 50mA	I _B = 4mA			1.3	
h _{FE} ⁽¹⁾	Forward-current transfer ratio	I _C = 0.2mA	V _{CE} = 10V	10			
		I _C = 2mA	V _{CE} = 10V	30			
		I _C = 20mA	V _{CE} = 10V	40		160	
			T _A = -55°C	15			
DYNAMIC CHARACTERISTICS							
h _{fe}	Small signal forward-current transfer ratio	I _C = 5mA f = 1.0KHz	V _{CE} = 10V	25			
h _{fe}	Magnitude of Common-Emitter Small-Signal Short-Circuit forward Current, Transfer Ratio	I _C = 10mA f = 5MHz	V _{CE} = 10V	3		15	MHz
C _{obo}	Output Capacitance	V _{CB} = 10V f = 1.0MHz	I _E = 0			10	pF
C _{ibo}	Input Capacitance	V _{EB} = 5V f = 1.0MHz	I _C = 0			75	pF
t _{on}	Turn-On Time	I _C = 20mA I _{B1} = 2mA	V _{CC} = 200V			1.0	μs
t _{off}	Turn-Off Time	I _C = 20mA I _{B1} = - I _{B2} = 2mA	V _{CC} = 200V			10	

Notes

(1) Pulse Width $\leq 380\mu\text{s}$, $\delta \leq 2\%$

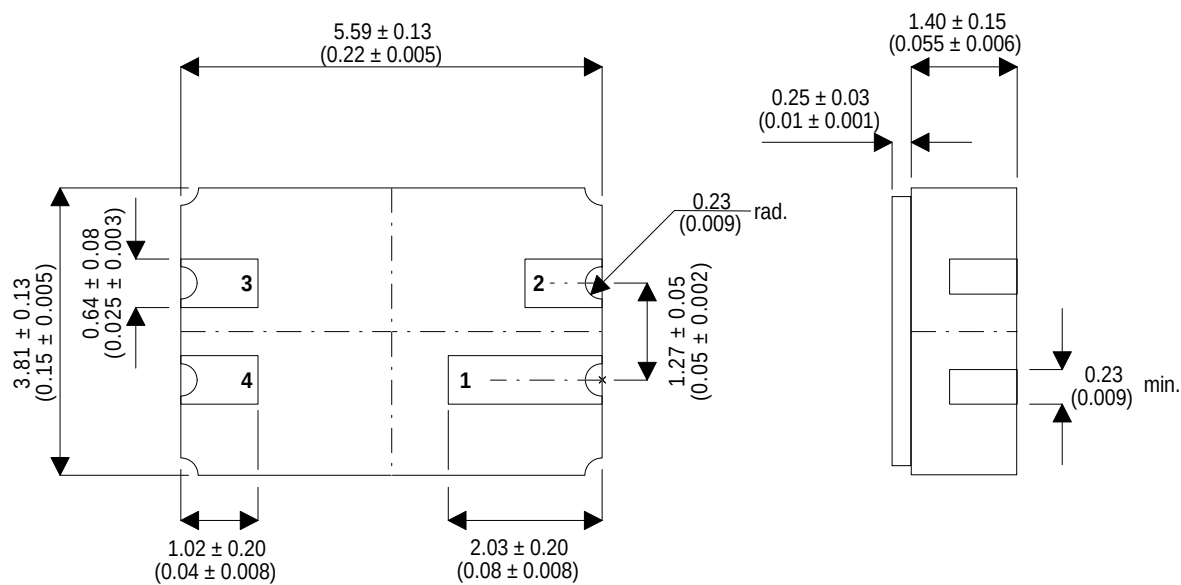
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2N3440CSM4 / 2N3440CSM4R

MECHANICAL DATA

Dimensions in mm (inches)



LCC3 (MO-041BA)

Underside View

Part Variant Table

Part	Pad 1	Pad 2	Pad 3	Pad 4
2N3439CSM4	Collector	N/C	Emitter	Base
2N3439CSM4R	Collector	Emitter	N/C	Base
2N3440CSM4	Collector	N/C	Emitter	Base
2N3440CSM4R	Collector	Emitter	N/C	Base

N/C = No Connection