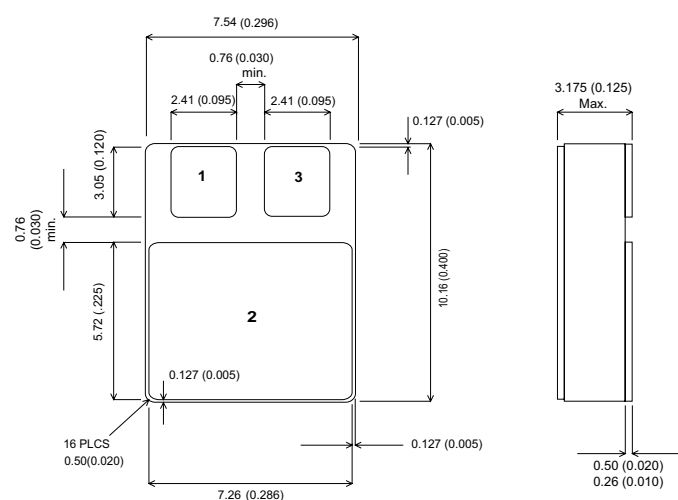


**MECHANICAL DATA**

Dimensions in mm (inches)

**NPN BIPOLAR TRANSISTOR IN A CERAMIC SURFACE MOUNT PACKAGE FOR HIGH-REL AND SPACE APPLICATIONS**



**SMD05**

Underside View

PAD 1 = Base PAD 2 = Collector PAD 3 = Emitter

**DESCRIPTION**

The 2N5152SMD05 and the 2N5154SMD05 are silicon epitaxial planar NPN transistors in a Ceramic Surface Mount Package for use in Switching and Linear applications.

The complementary NPN types are the 2N5151SMD05 and 2N5153SMD05 respectively

**ABSOLUTE MAXIMUM RATINGS**

$T_{CASE} = 25^{\circ}C$  unless otherwise stated

		2N5152SMD05	2N5154SMD05
$V_{CBO}$	Collector – Base Voltage		100V
$V_{CEO}$	Collector – Emitter Voltage ( $I_B = 0$ )		75V
$V_{EBO}$	Emitter – Base Voltage ( $I_C = 0$ )		6V
$I_C$	Continuous Collector Current		5A
$I_{C(PK)}$	Peak Collector Current		10A
$I_B$	Base Current		1A
$P_{tot}$	Total Dissipation at $T_{amb} = 25^{\circ}C$		1W
	$T_{case} = 50^{\circ}C$		10W
	$T_{case} = 100^{\circ}C$		6.7W
$T_{stg}$	Operating and Storage Temperature Range		-65 to +200°C
$T_j$	Junction temperature		200°C

**ELECTRICAL CHARACTERISTICS FOR 2N5152SMD05** ( $T_{case} = 25^{\circ}C$  unless otherwise stated)

Parameter		Test Conditions	Min.	Typ.	Max.	Unit
$I_{CES}$	Collector Cut Off Current	$V_{CE} = 60V$ $V_{BE} = 0$			1	$\mu A$
		$V_{CE} = 100V$ $V_{BE} = 0$			1	mA
$I_{CEV}$	Collector Cut Off Current	$V_{CE} = 60V$ $T_{case} = 150^{\circ}C$ $V_{BE} = -2V$			500	$\mu A$
$I_{CEO}$	Collector Cut Off Current	$V_{CE} = 40V$ $I_B = 0$			50	
$I_{EBO}$	Emitter Cut Off Current	$V_{EB} = 4V$ $I_C = 0$			1	$\mu A$
		$V_{EB} = 6V$ $I_C = 0$			1	mA
$V_{CEO(SUS)}$	Collector Emitter Saturation Voltage	$I_C = 100mA$ $I_B = 0$	75			
$V_{CE(sat)}$	Collector Emitter Saturation Voltage	$I_C = 2.5A$ $I_B = 250mA$			0.75	V
		$I_C = 5A$ $I_B = 500mA$			1.5	
$V_{BE(sat)}$	Base Emitter Saturation Voltage	$I_C = 2.5A$ $I_B = 250mA$			1.45	
		$I_C = 5A$ $I_B = 500mA$			2.2	
$V_{BE}$	Base Emitter Voltage	$I_C = 2.5A$ $V_{CE} = 5V$			1.45	
$h_{FE}$	DC Current Gain	$I_C = 50mA$ $V_{CE} = 5V$	20			—
		$I_C = 2.5A$ $V_{CE} = 5V$	30		90	
		$I_C = 5A$ $V_{CE} = 5V$ $T_{case} = -55^{\circ}C$	20			
		$I_C = 2.5A$ $V_{CE} = 5V$	15			
$C_{CBO}$	Collector Base Capacitance	$I_E = 0$ $V_{CB} = 10V$ $f = 1MHz$			250	pF
$h_{FE}$	Small Signal Current Gain	$I_C = 0.1A$ $V_{CE} = 5V$ $f = 1KHz$	20			—
		$I_C = 0.5A$ $V_{CE} = 5V$ $f = 20MHz$	3			
$t_{on}$	Turn On Time	$I_C = 5A$ $V_{CC} = 30V$ $I_{B1} = 0.5A$		0.5		$\mu s$
$t_{off}$	Turn Off Time	$I_C = 5A$ $V_{CC} = 30V$ $I_{B1} = -I_{B2} = 0.5A$		1.3		$\mu s$

\* Pulse test  $t_p = 300\mu s$ ,  $\delta < 2\%$

**THERMAL DATA**

$R_{thj-case}$	Thermal Resistance Junction-case			15	$^{\circ}C/W$
$R_{thj-amb}$	Thermal Resistance Junction-ambient			175	$^{\circ}C/W$

**ELECTRICAL CHARACTERISTICS FOR 2N5154SMD05** ( $T_{case} = 25^{\circ}C$  unless otherwise stated)

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CES}$ Collector Cut Off Current	$V_{CE} = 60V$ $V_{BE} = 0$			1	$\mu A$
	$V_{CE} = 100V$ $V_{BE} = 0$			1	mA
$I_{CEV}$ Collector Cut Off Current	$V_{CE} = 60V$ $T_{case} = 150^{\circ}C$ $V_{BE} = -2V$			500	$\mu A$
$I_{CEO}$ Collector Cut Off Current	$V_{CE} = 40V$ $I_B = 0$			50	
$I_{EBO}$ Emitter Cut Off Current	$V_{EB} = 4V$ $I_C = 0$			1	$\mu A$
	$V_{EB} = 6V$ $I_C = 0$			1	mA
$V_{CEO(SUS)}$ Collector Emitter Saturation Voltage	$I_C = 100mA$ $I_B = 0$	75			V
$V_{CE(sat)}$ Collector Emitter Saturation Voltage	$I_C = 2.5A$ $I_B = 250mA$			0.75	
	$I_C = 5A$ $I_B = 500mA$			1.5	
$V_{BE(sat)}$ Base Emitter Saturation Voltage	$I_C = 2.5A$ $I_B = 250mA$			1.45	
	$I_C = 5A$ $I_B = 500mA$			2.2	
$V_{BE}$ Base Emitter Voltage	$I_C = 2.5A$ $V_{CE} = 5V$			1.45	
$h_{FE}$ DC Current Gain	$I_C = 50mA$ $V_{CE} = 5V$	50			—
	$I_C = 2.5A$ $V_{CE} = 5V$	70		200	
	$I_C = 5A$ $V_{CE} = 5V$ $T_{case} = -55^{\circ}C$	40			
	$I_C = 2.5A$ $V_{CE} = 5V$	35			
$C_{CBO}$ Collector Base Capacitance	$I_E = 0$ $V_{CB} = 10V$ $f = 1MHz$			250	pF
$h_{FE}$ Small Signal Current Gain	$I_C = 0.1A$ $V_{CE} = 5V$ $f = 1KHz$	20			—
	$I_C = 0.5A$ $V_{CE} = 5V$ $f = 20MHz$	3			
$t_{on}$ Turn On Time	$I_C = 5A$ $V_{CC} = 30V$ $I_{B1} = 0.5A$		0.5		$\mu s$
$t_{off}$ Turn Off Time	$I_C = 5A$ $V_{CC} = 30V$ $I_{B1} = -I_{B2} = 0.5A$		1.3		$\mu s$

\* Pulse test  $t_p = 300\mu s$ ,  $\delta < 2\%$

**THERMAL DATA**

$R_{thj-case}$ Thermal Resistance Junction-case			15	$^{\circ}C/W$
$R_{thj-amb}$ Thermal Resistance Junction-ambient			175	$^{\circ}C/W$