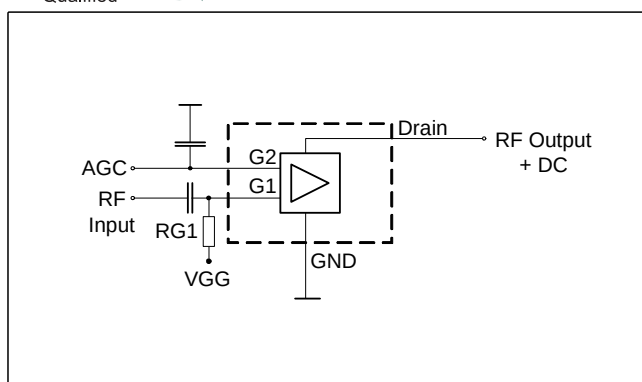
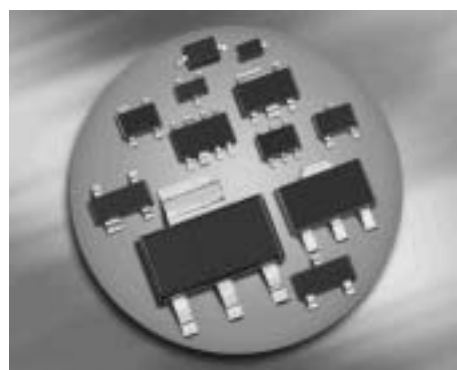


Silicon N-Channel MOSFET Tetrode

- For low noise, high gain controlled input stages up to 1GHz
- Operating voltage 5V
- Pb-free (RoHS compliant) package¹⁾
- Qualified according AEC Q101



ESD (Electrostatic discharge) sensitive device, observe handling precaution!

Class 2 (2000V - 4000V) pin to pin **Human Body Model**

Type	Package	Pin Configuration						Marking
BF2030	SOT143	1= S	2=D	3=G2	4=G1	-	-	NDs
BF2030R	SOT143R	1= D	2=S	3=G1	4=G2	-	-	NDs
BF2030W	SOT343	1= D	2=S	3=G1	4=G2	-	-	NDs

Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	8	V
Continuous drain current	I_D	40	mA
Gate 1/ gate 2-source current	$\pm I_{G1/2SM}$	10	
Gate 1 (external biasing)	$+V_{G1SE}$	6	V
Total power dissipation	P_{tot}		mW
$T_S \leq 76^\circ\text{C}$, BF2030, BF2030R		200	
$T_S \leq 94^\circ\text{C}$, BF2030W		200	
Storage temperature	T_{stg}	-55 ... 150	$^\circ\text{C}$
Channel temperature	T_{ch}	150	

¹⁾Pb-containing package may be available upon special request

Thermal Resistance

Parameter	Symbol	Value	Unit
Channel - soldering point ¹⁾ BF2030/ BF2030R BF2030W	R_{thchs}	≤ 370 ≤ 280	K/W

Electrical Characteristics at $T_A = 25^\circ\text{C}$, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics					
Drain-source breakdown voltage $I_D = 20\text{ }\mu\text{A}$, $V_{G1S} = 0$, $V_{G2S} = 0$	$V_{(BR)DS}$	10	-	-	V
Gate1-source breakdown voltage $+I_{G1S} = 10\text{ mA}$, $V_{G2S} = 0$, $V_{DS} = 0$	$+V_{(BR)G1SS}$	6	-	15	
Gate2-source breakdown voltage $+I_{G2S} = 10\text{ mA}$, $V_{G1S} = 0$, $V_{DS} = 0$	$+V_{(BR)G2SS}$	6	-	15	
Gate1-source leakage current $V_{G1S} = 5\text{ V}$, $V_{G2S} = 0$, $V_{DS} = 0$	$+I_{G1SS}$	-	-	50	nA
Gate2-source leakage current $V_{G2S} = 5\text{ V}$, $V_{G1S} = 0$, $V_{DS} = 0$	$+I_{G2SS}$	-	-	50	
Drain current $V_{DS} = 5\text{ V}$, $V_{G1S} = 0$, $V_{G2S} = 4\text{ V}$	I_{DSS}	-	-	50	μA
Drain-source current $V_{DS} = 5\text{ V}$, $V_{G2S} = 4\text{ V}$, $R_{G1} = 100\text{ k}\Omega$	I_{DSX}	-	12	-	mA
Gate1-source pinch-off voltage $V_{DS} = 5\text{ V}$, $V_{G2S} = 4\text{ V}$, $I_D = 20\text{ }\mu\text{A}$	$V_{G1S(p)}$	0.3	0.5	-	V
Gate2-source pinch-off voltage $V_{DS} = 5\text{ V}$, $I_D = 20\text{ }\mu\text{A}$	$V_{G2S(p)}$	0.3	0.6	-	

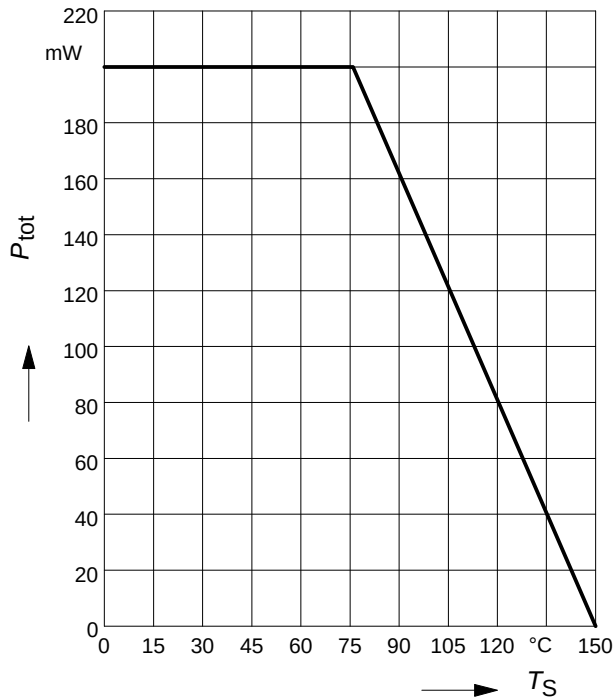
¹⁾For calculation of R_{thJA} please refer to Application Note Thermal Resistance

Electrical Characteristics at $T_A = 25^\circ\text{C}$, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics (verified by random sampling)					
Forward transconductance $V_{DS} = 5\text{ V}$, $I_D = 10\text{ mA}$, $V_{G2S} = 4\text{ V}$	g_{fs}	27	31	-	mS
Gate1 input capacitance $V_{DS} = 5\text{ V}$, $I_D = 10\text{ mA}$, $V_{G2S} = 4\text{ V}$, $f = 10\text{ MHz}$	C_{g1ss}	-	2.4	2.8	pF
Output capacitance $V_{DS} = 5\text{ V}$, $I_D = 10\text{ mA}$, $V_{G2S} = 4\text{ V}$, $f = 10\text{ MHz}$	C_{dss}	-	1.3	-	
Power gain $V_{DS} = 5\text{ V}$, $I_D = 10\text{ mA}$, $V_{G2S} = 4\text{ V}$, $f = 800\text{ MHz}$	G_p	20	23	-	dB
Noise figure $V_{DS} = 5\text{ V}$, $I_D = 10\text{ mA}$, $V_{G2S} = 4\text{ V}$, $f = 800\text{ MHz}$	F	-	1.5	2.2	dB
Gain control range $V_{DS} = 5\text{ V}$, $V_{G2S} = 4...0\text{ V}$, $f = 800\text{ MHz}$	ΔG_p	40	50	-	

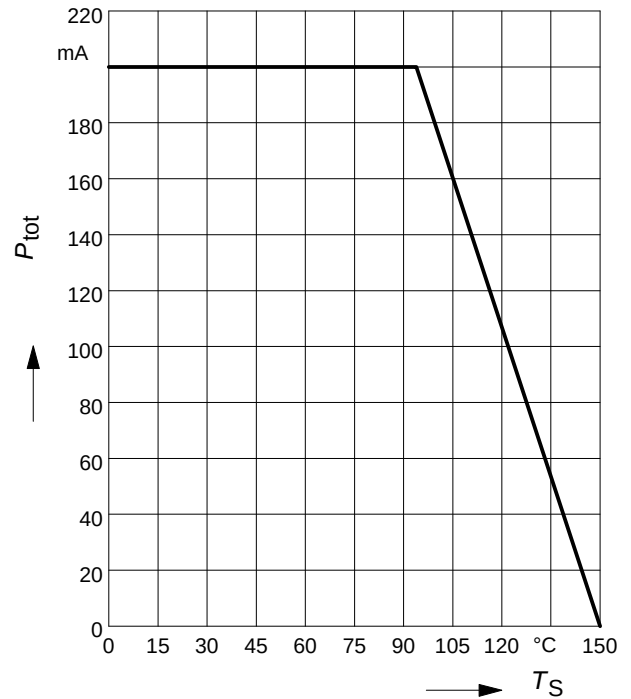
Total power dissipation $P_{\text{tot}} = f(T_S)$

BF2030, BF2030R



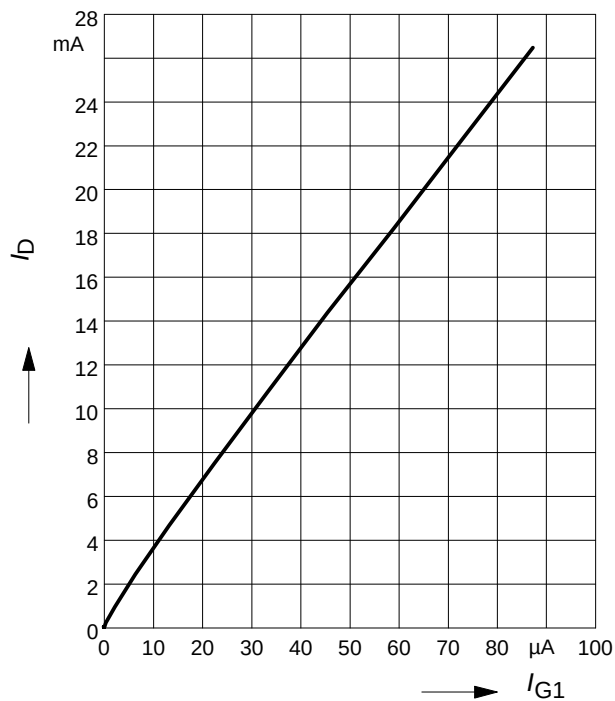
Total power dissipation $P_{\text{tot}} = f(T_S)$

BF2030W



Drain current $I_D = f(I_{G1})$

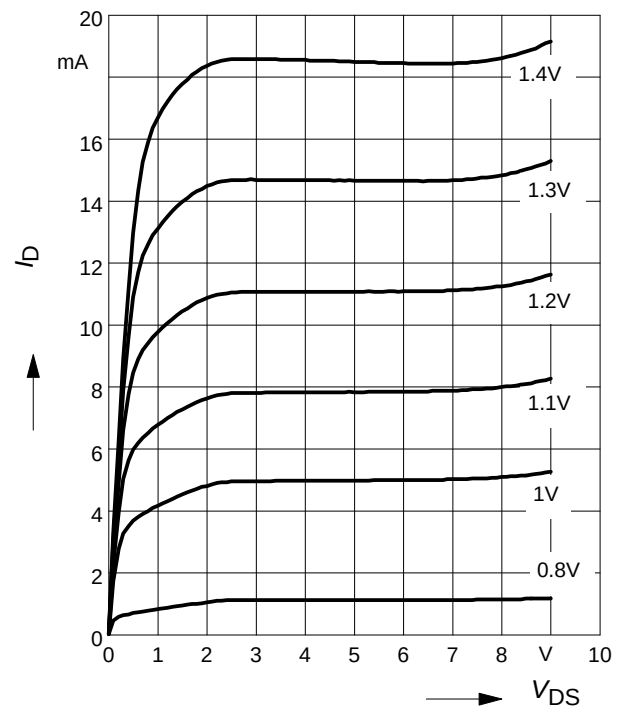
$V_{G2S} = 4V$



Output characteristics $I_D = f(V_{DS})$

$V_{G2S} = 4V$

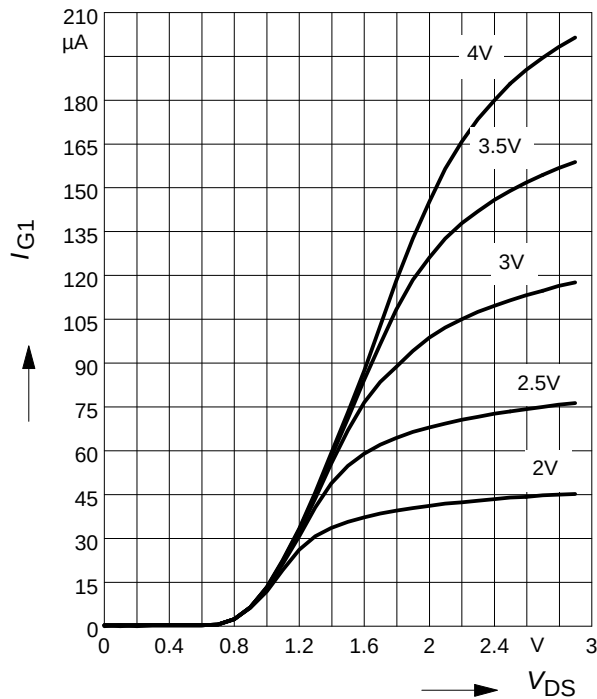
$V_{G1S} = \text{Parameter}$



Gate 1 current $I_{G1} = f(V_{G1S})$

$V_{DS} = 5V$

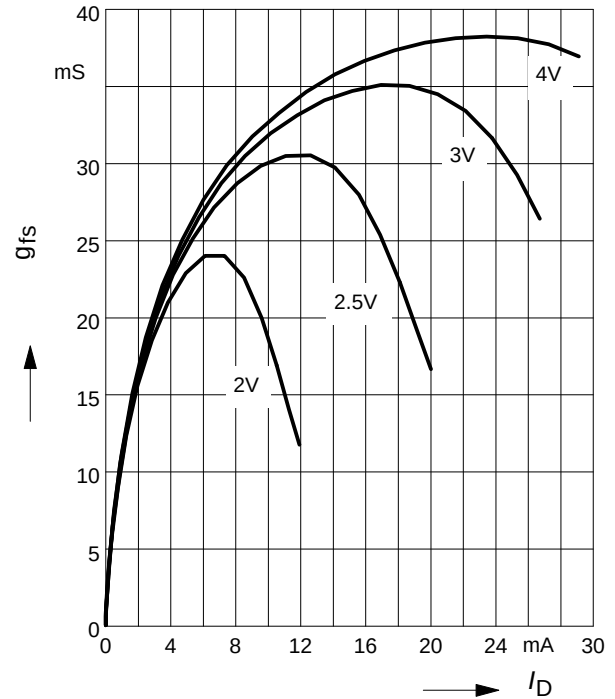
$V_{G2S} = \text{Parameter}$



Gate 1 forward transconductance

$g_{fs} = f(I_D)$

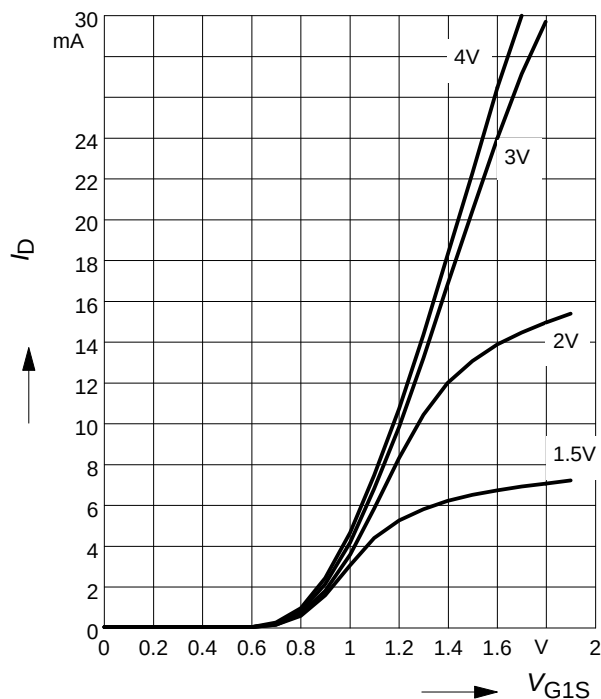
$V_{DS} = 5V, V_{G2S} = \text{Parameter}$



Drain current $I_D = f(V_{G1S})$

$V_{DS} = 5V$

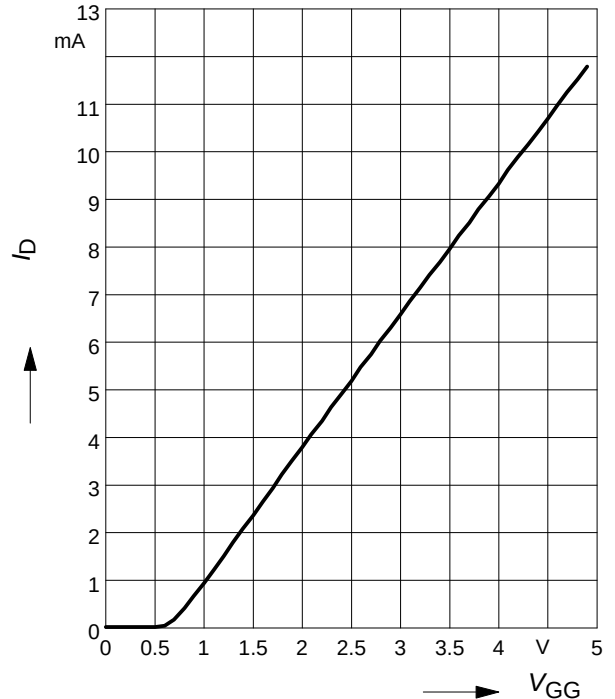
$V_{G2S} = \text{Parameter}$



Drain current $I_D = f(V_{GG})$

$V_{DS} = 5V, V_{G2S} = 4V, R_{G1} = 100k\Omega$

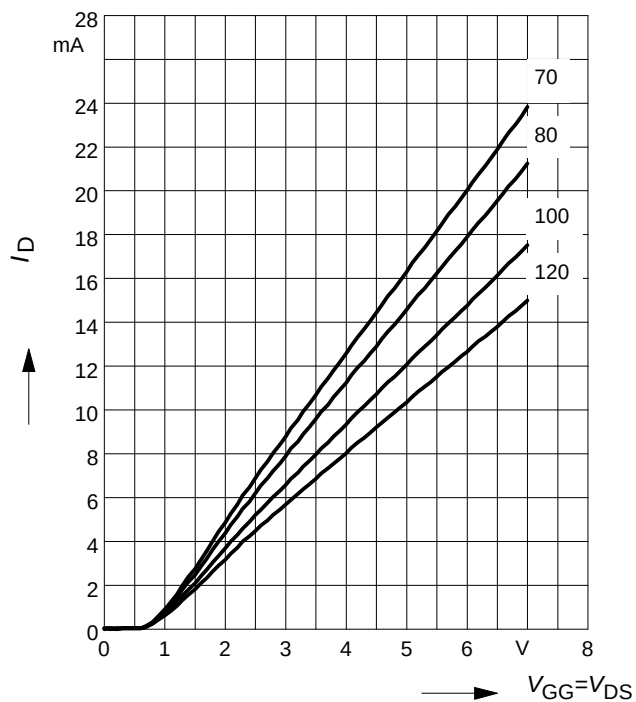
(connected to V_{GG} , $V_{GG} = \text{gate1 supply voltage}$)



Drain current $I_D = f(V_{GG})$

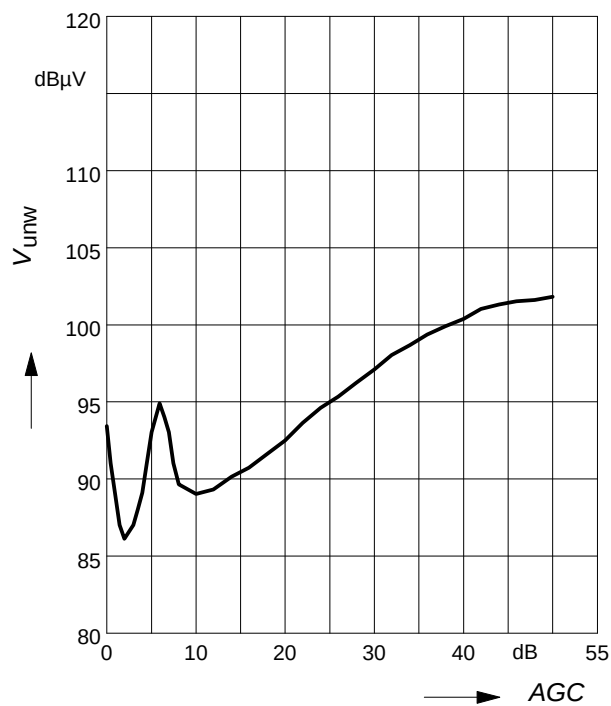
$V_{G2S} = 4V$

R_{G1} = Parameter in $k\Omega$

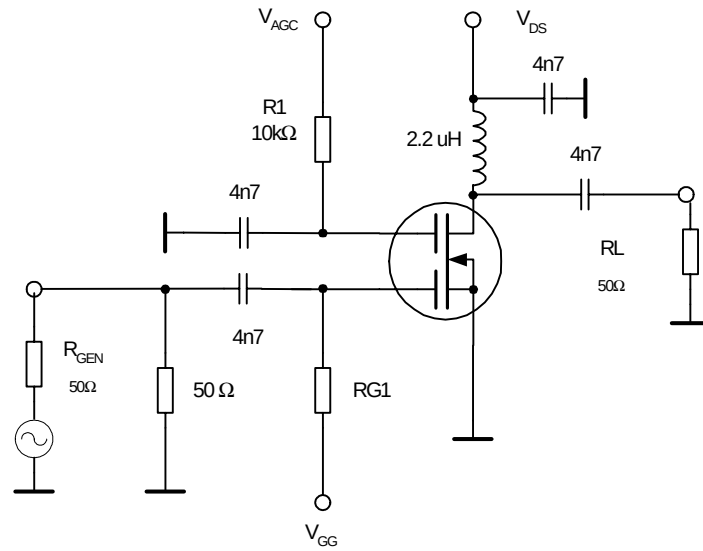


Crossmodulation $V_{unw} = (AGC)$

$V_{DS} = 5 V$

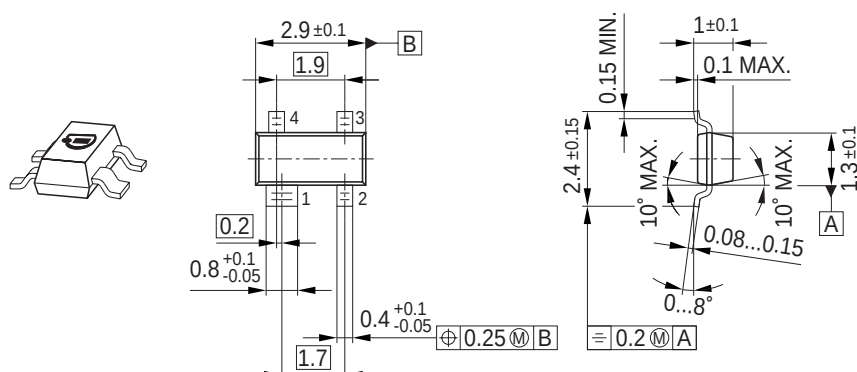


Cossmodulation test circuit

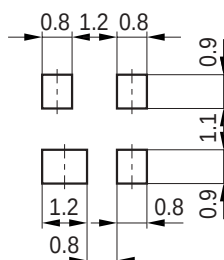


Semibiased

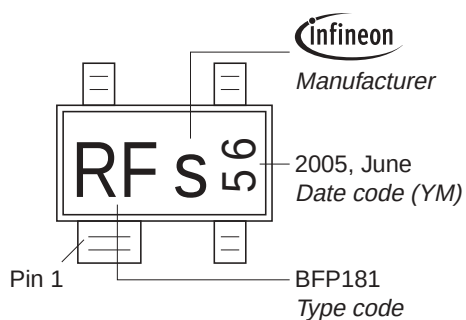
Package Outline



Foot Print

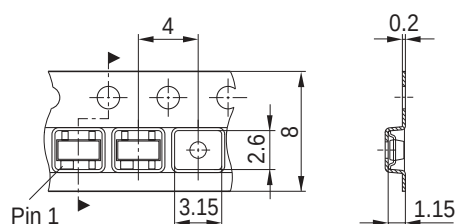


Marking Layout (Example)

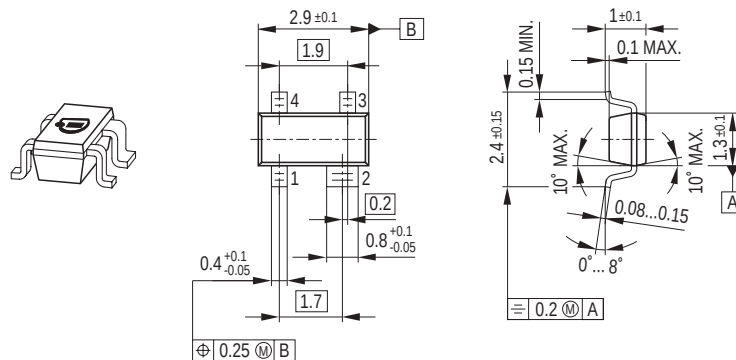


Standard Packing

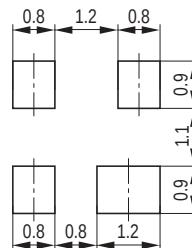
Reel ø180 mm = 3.000 Pieces/Reel
 Reel ø330 mm = 10.000 Pieces/Reel



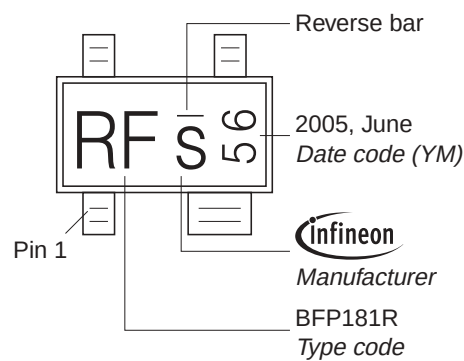
Package Outline



Foot Print

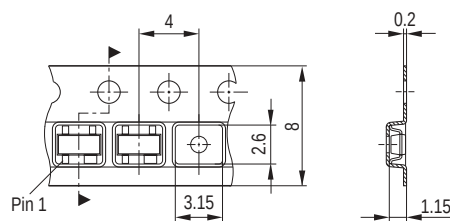


Marking Layout (Example)

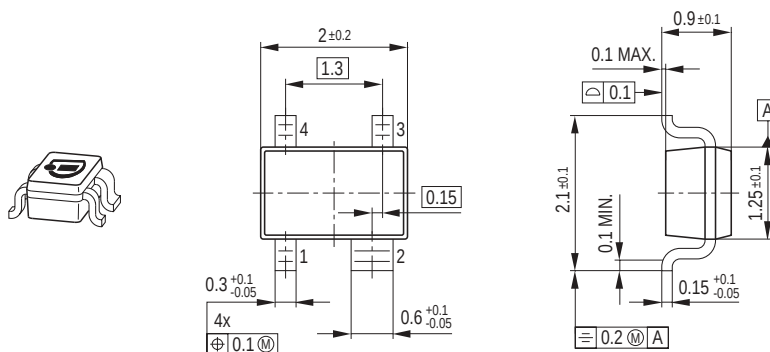


Standard Packing

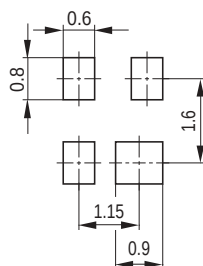
Reel ø180 mm = 3.000 Pieces/Reel
Reel ø330 mm = 10.000 Pieces/Reel



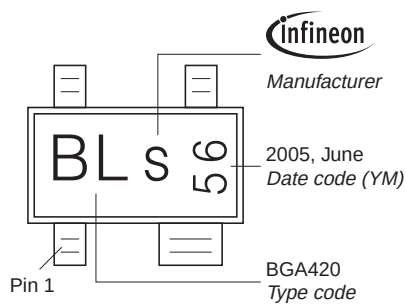
Package Outline



Foot Print

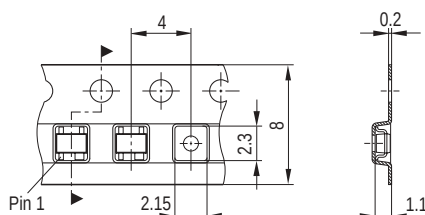


Marking Layout (Example)



Standard Packing

Reel ø180 mm = 3.000 Pieces/Reel
 Reel ø330 mm = 10.000 Pieces/Reel



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