



## PD55008L-E

RF POWER transistor, LDMOST plastic family  
N-Channel enhancement-mode lateral MOSFETs

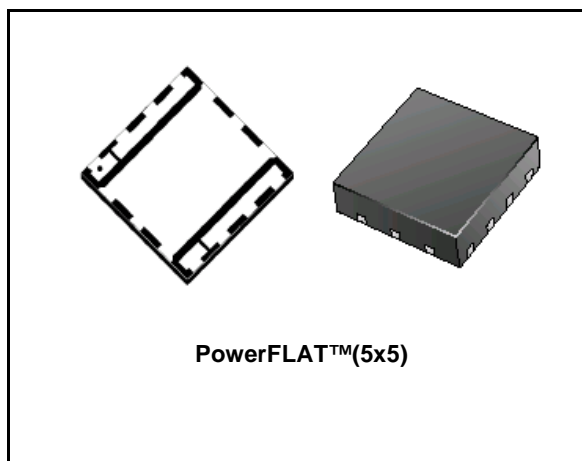
### General features

- Excellent thermal stability
- Common source configuration
- $P_{OUT} = 8W$  with 17dB gain @ 500MHz / 12.5V
- Integrated ESD protection
- New leadless plastic package
- Supplied in tape and reel of 3K units
- In compliance with 2002/95/EC european directive

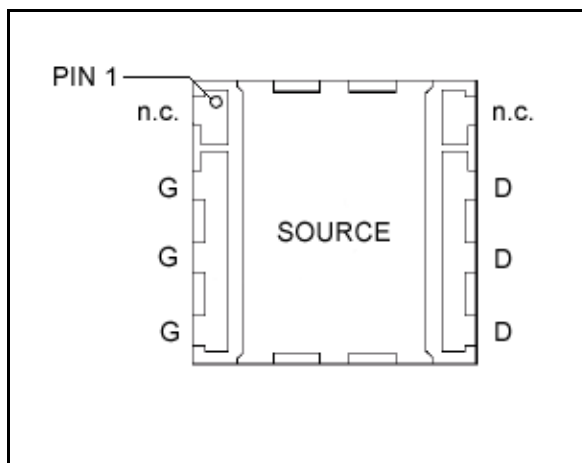
### Description

The PD55008L-E is a common source N-channel, enhancement-mode lateral Field-Effect RF power transistor. It is designed for high gain, broad band commercial and industrial applications. It operates at 12V in common source mode at frequencies up to 1GHz.

PD55008L-E boasts the excellent gain, linearity and reliability of STH1LV latest LDMOS technology mounted in the innovative leadless SMD plastic package, PowerFLAT™. PD55008L-E's superior linearity performance makes it an ideal solution for car mobile radio.



### Pin connection



### Order codes

Part number	Marking	Package	Packaging
PD55008L-E	55008	PowerFLAT™(5x5)	Tape and reel

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# 1 Electrical data

## 1.1 Maximum ratings

Table 1. Absolute maximum ratings ( $T_{CASE} = 25^{\circ}C$ )

Symbol	Parameter	Value	Unit
$V_{(BR)DSS}$	Drain-source voltage	40	V
$V_{GS}$	Gate-source voltage	-0.5 to +15	V
$I_D$	Drain current	5	A
$P_{DISS}$	Power dissipation (@ $T_C = 70^{\circ}C$ )	19.5	W
$T_J$	Max. operating junction temperature	150	$^{\circ}C$
$T_{STG}$	Storage temperature	-65 to +150	$^{\circ}C$

## 1.2 Thermal data

Table 2. Thermal data

Symbol	Parameter	Value	Unit
$R_{thJC}$	Junction - case thermal resistance	4.1	$^{\circ}C/W$

## 2 Electrical characteristics

( $T_{CASE} = +25\text{ }^{\circ}\text{C}$ )

### 2.1 Static

**Table 3. Static**

Symbol	Test conditions	Min.	Typ.	Max.	Unit
$I_{DSS}$	$V_{GS} = 0\text{ V}$ $V_{DS} = 28\text{ V}$			1	$\mu\text{A}$
$I_{GSS}$	$V_{GS} = 5\text{ V}$ $V_{DS} = 0\text{ V}$			1	$\mu\text{A}$
$V_{GS(Q)}$	$V_{DS} = 10\text{ V}$ $I_D = 150\text{ mA}$	2.0		5.0	V
$V_{DS(ON)}$	$V_{GS} = 10\text{ V}$ $I_D = 0.5\text{ A}$		0.13	0.14	V
$G_{FS}$	$V_{DS} = 10\text{ V}$ $I_D = 1.5\text{ A}$		1.6		mho
$C_{ISS}$	$V_{GS} = 0\text{ V}$ $V_{DS} = 12.5\text{ V}$ $f = 1\text{ MHz}$		53		pF
$C_{OSS}$	$V_{GS} = 0\text{ V}$ $V_{DS} = 12.5\text{ V}$ $f = 1\text{ MHz}$		38		pF
$C_{RSS}$	$V_{GS} = 0\text{ V}$ $V_{DS} = 12.5\text{ V}$ $f = 1\text{ MHz}$		3.2		pF

### 2.2 Dynamic

**Table 4. Dynamic**

Symbol	Test conditions	Min.	Typ.	Max.	Unit
$P_{OUT}$	$V_{DD} = 12.5\text{V}$ , $I_{DQ} = 150\text{mA}$ $f = 500\text{MHz}$	8			W
$G_P$	$V_{DD} = 12.5\text{V}$ , $I_{DQ} = 150\text{mA}$ , $P_{OUT} = 8\text{W}$ , $f = 500\text{MHz}$	17	19		dB
$h_D$	$V_{DD} = 12.5\text{V}$ , $I_{DQ} = 150\text{mA}$ , $P_{OUT} = 8\text{W}$ , $f = 500\text{MHz}$	55	63		%
Load mismatch	$V_{DD} = 15.5\text{V}$ , $I_{DQ} = 150\text{mA}$ , $P_{OUT} = 8\text{W}$ , $f = 500\text{MHz}$ All phase angles	20:1			VSWR

### 2.3 ESD protection characteristics

**Table 5. ESD protection**

Test conditions	Class
Human Body Model	2
Machine Model	M3

### 2.4 Moisture sensitivity level

**Table 6. Moisture sensitivity level**

Test methodology	Rating
J-STD-020B	MSL 3

### 3 Typical performance

Figure 1. Capacitance vs. supply voltage

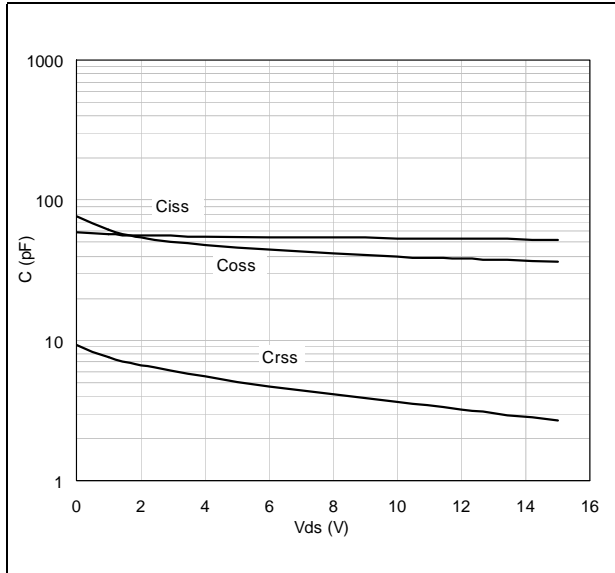


Figure 2. Output power vs. input power

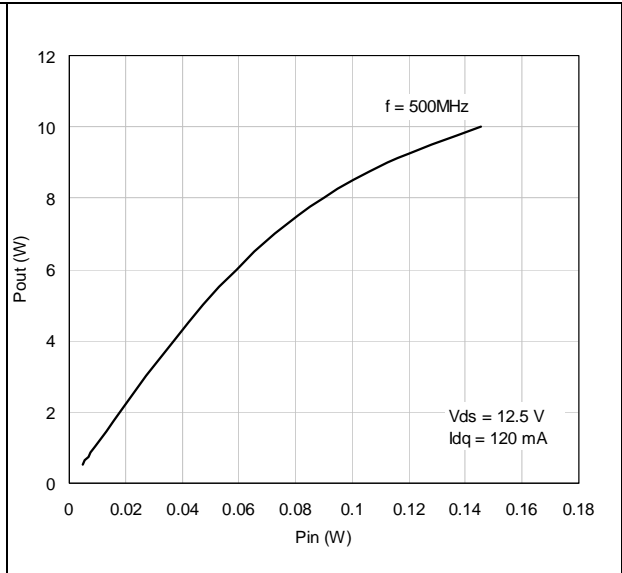


Figure 3. Power gain vs output power

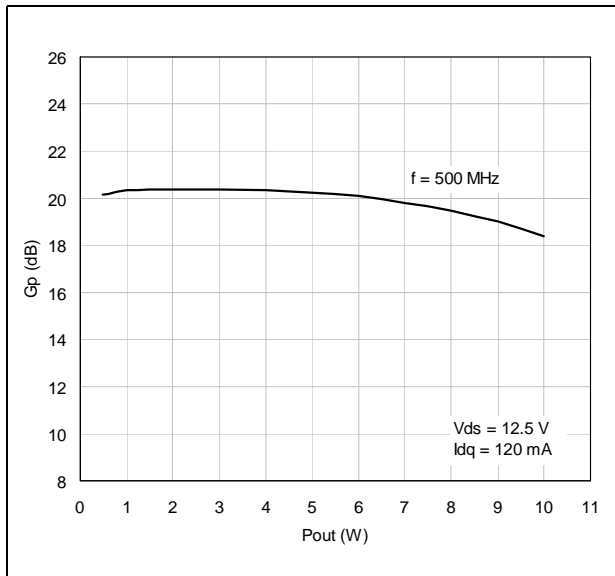


Figure 4. Efficiency vs. output power

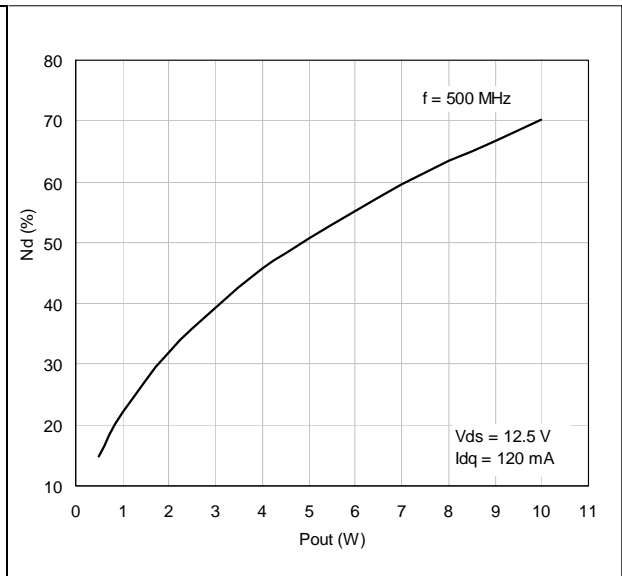
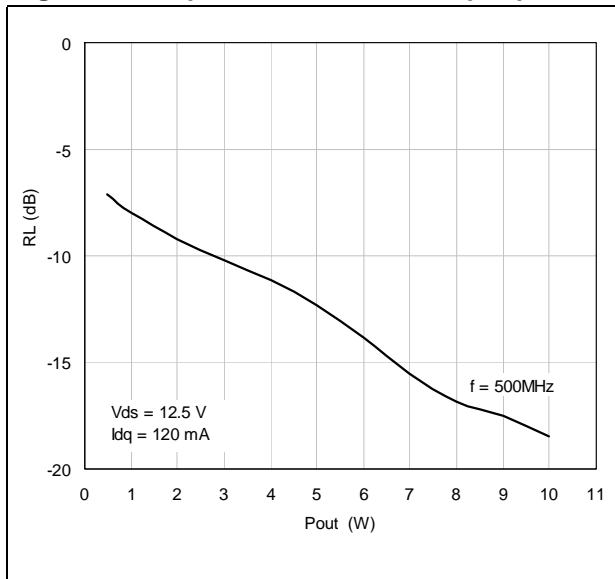


Figure 5. Input return loss vs. output power



## 4 Common source s-parameter

### 4.1 PD55008L ( $V_{DS} = 12.5V$ $I_{DS} = 0.15A$ )

Table 7. S-parameter

Freq. (MHz)	$ S_{11} $	$S_{11}\angle\Phi$	$ S_{21} $	$S_{21}\angle\Phi$	$ S_{12} $	$S_{12}\angle\Phi$
50	0.783	-134	16.75	100	0.034	11
100	0.774	-153	8.73	82	0.034	-6
150	0.791	-159	5.61	70	0.033	-15
200	0.814	-163	4.00	61	0.029	-22
250	0.838	-165	3.00	54	0.027	-28
300	0.862	-166	2.34	47	0.023	-32
350	0.879	-168	1.87	41	0.021	-35
400	0.894	-169	1.52	37	0.018	-37
450	0.908	-171	1.26	32	0.015	-37
500	0.919	-172	1.06	28	0.013	-37
550	0.927	-173	0.91	25	0.010	-36
600	0.937	-174	0.78	22	0.009	-33
650	0.942	-175	0.68	19	0.007	-20
700	0.945	-176	0.60	16	0.005	-7
750	0.948	-177	0.53	14	0.005	14
800	0.953	-178	0.47	12	0.006	36
850	0.956	-179	0.42	10	0.007	48
900	0.956	-179	0.38	9	0.007	60
950	0.957	180	0.34	7	0.009	66

## 4.2 PD55008L ( $V_{DS} = 12.5V$ $I_{DS} = 0.8A$ )

**Table 8. S-parameter**

Freq. (MHz)	$ S_{11} $	$S_{11}\angle\Phi$	$ S_{21} $	$S_{21}\angle\Phi$	$ S_{12} $	$S_{12}\angle\Phi$
50	0.828	-147	19.60	97	0.023	11
100	0.822	-162	10.11	84	0.023	-1
150	0.829	-167	6.61	75	0.022	-7
200	0.839	-169	4.82	68	0.021	-11
250	0.852	-170	3.71	62	0.019	-16
300	0.866	-171	2.97	56	0.017	-17
350	0.877	-172	2.43	51	0.015	-18
400	0.887	-173	2.02	46	0.014	-18
450	0.898	-174	1.71	42	0.012	-16
500	0.907	-175	1.47	38	0.010	-12
550	0.916	-175	1.27	34	0.009	-10
600	0.923	-176	1.10	31	0.008	1
650	0.929	-177	0.98	27	0.007	12
700	0.931	-178	0.86	25	0.007	23
750	0.937	-179	0.77	22	0.008	37
800	0.942	-179	0.69	20	0.008	44
850	0.948	-180	0.62	17	0.009	53
900	0.946	180	0.56	15	0.010	61
950	0.948	179	0.51	13	0.011	65
1000	0.950	178	0.47	12	0.012	67
1050	0.950	178	0.43	10	0.013	71
1100	0.953	177	0.39	8	0.016	71
1150	0.953	176	0.36	7	0.016	72



### 4.3 PD55008L ( $V_{DS} = 12.5V$ $I_{DS} = 1.5A$ )

**Table 9. S-parameter**

Freq. (MHz)	$ S_{11} $	$S_{11}\angle\Phi$	$ S_{21} $	$S_{21}\angle\Phi$	$ S_{12} $	$S_{12}\angle\Phi$
50	0.835	-145	18.15	98	0.023	11
100	0.831	-161	9.38	84	0.023	-1
150	0.837	-166	6.14	75	0.022	-7
200	0.847	-169	4.47	68	0.020	-11
250	0.858	-170	3.44	61	0.019	-15
300	0.872	-171	2.74	55	0.017	-17
350	0.882	-172	2.24	50	0.015	-17
400	0.893	-173	1.87	46	0.014	-18
450	0.904	-174	1.58	41	0.012	-16
500	0.913	-175	1.35	37	0.010	-13
550	0.920	-176	1.17	33	0.009	-5
600	0.927	-177	1.02	30	0.008	1
650	0.931	-177	0.89	27	0.007	13
700	0.935	-178	0.79	24	0.007	28
750	0.940	-179	0.70	22	0.008	41
800	0.944	-180	0.63	19	0.008	48
850	0.948	180	0.57	17	0.009	55
900	0.948	179	0.51	15	0.010	61
950	0.947	179	0.47	13	0.011	65
1000	0.949	178	0.43	11	0.013	66
1050	0.949	177	0.39	10	0.014	70
1100	0.951	177	0.36	8	0.015	72

## 5 Mechanical data

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect . The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: [www.st.com](http://www.st.com)

**Table 10. PowerFLAT™ Mechanical data**

Dim.	mm.			Inch		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A		0.90	1.00		0.035	0.039
A1		0.02	0.05		0.001	0.002
A3		0.24			0.009	
AA	0.15	0.25	0.35	0.006	0.01	0.014
b	0.43	0.51	0.58	0.017	0.020	0.023
c	0.64	0.71	0.79	0.025	0.028	0.031
D		5.00			0.197	
d		0.30			0.011	
E		5.00			0.197	
E2	2.49	2.57	2.64	0.098	0.101	0.104
e		1.27			0.050	
f		3.37			0.132	
g		0.74			0.03	
h		0.21			0.008	

**Figure 6. Package dimensions**

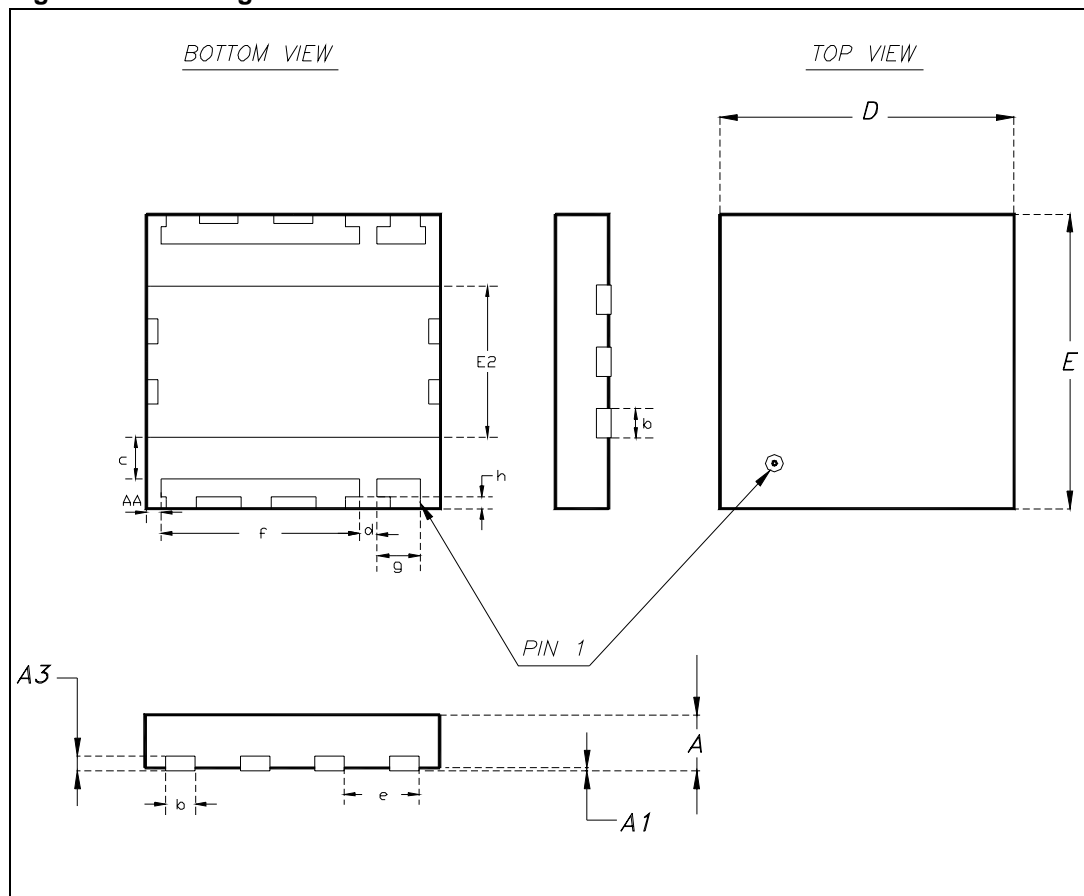


Figure 7. Recommended footprint

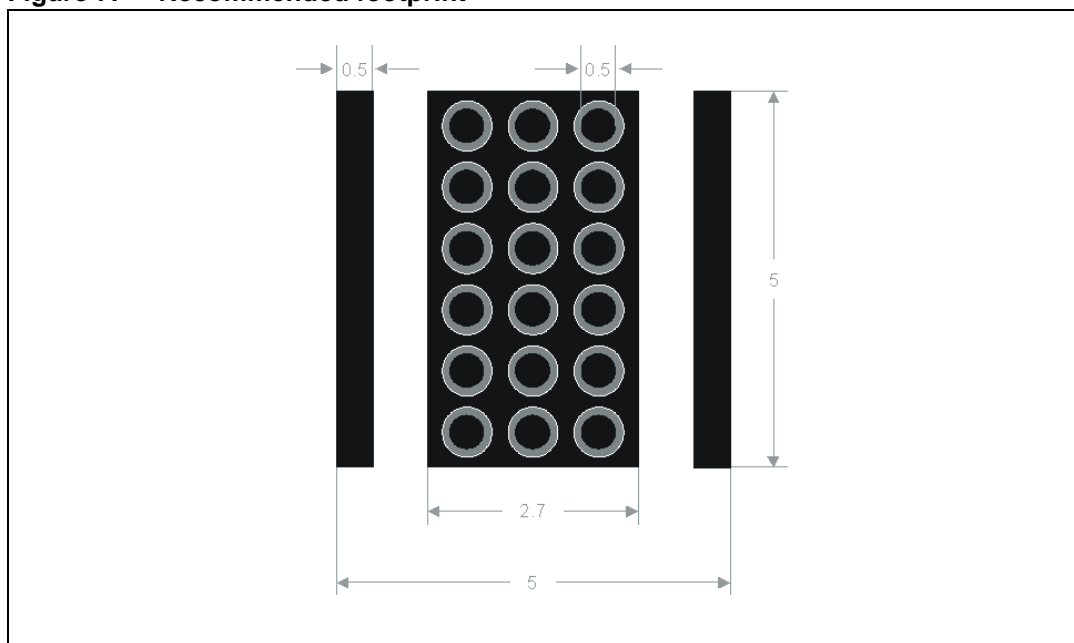
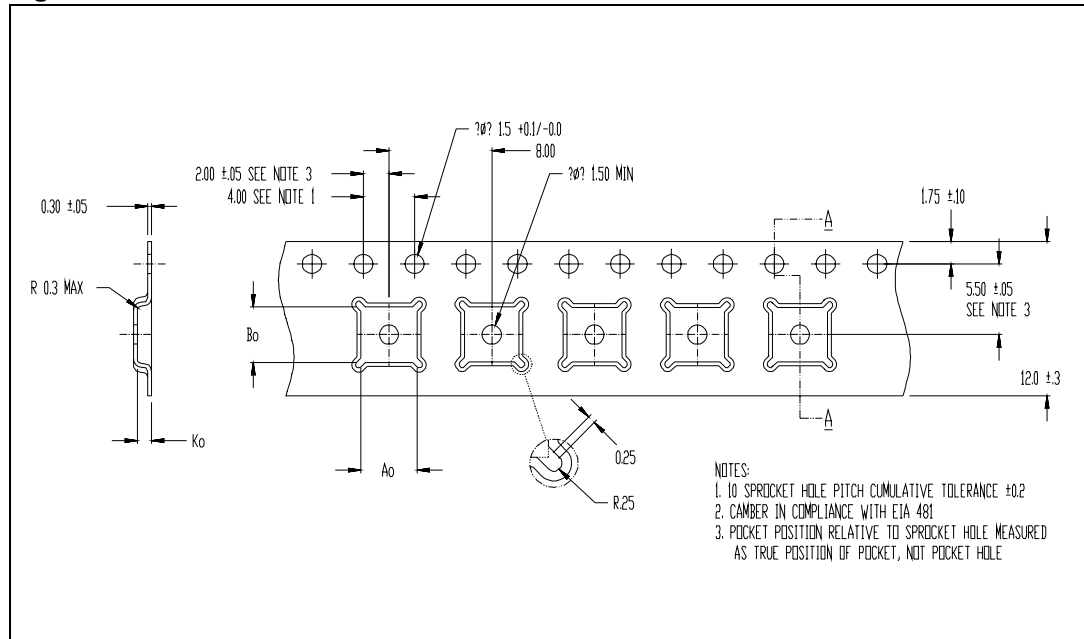


Table 11. Tape and reel dimensions

Dim.	mm		
	Min.	Typ.	Max
Ao	5.15	5.25	5.35
Bo	5.15	5.25	5.35
Ko	1.0	1.1	1.2

Figure 8. Reel information



## 6 Revision history

**Table 12. Revision history**

Date	Revision	Changes
07-Apr-2006	1	Initial release.

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