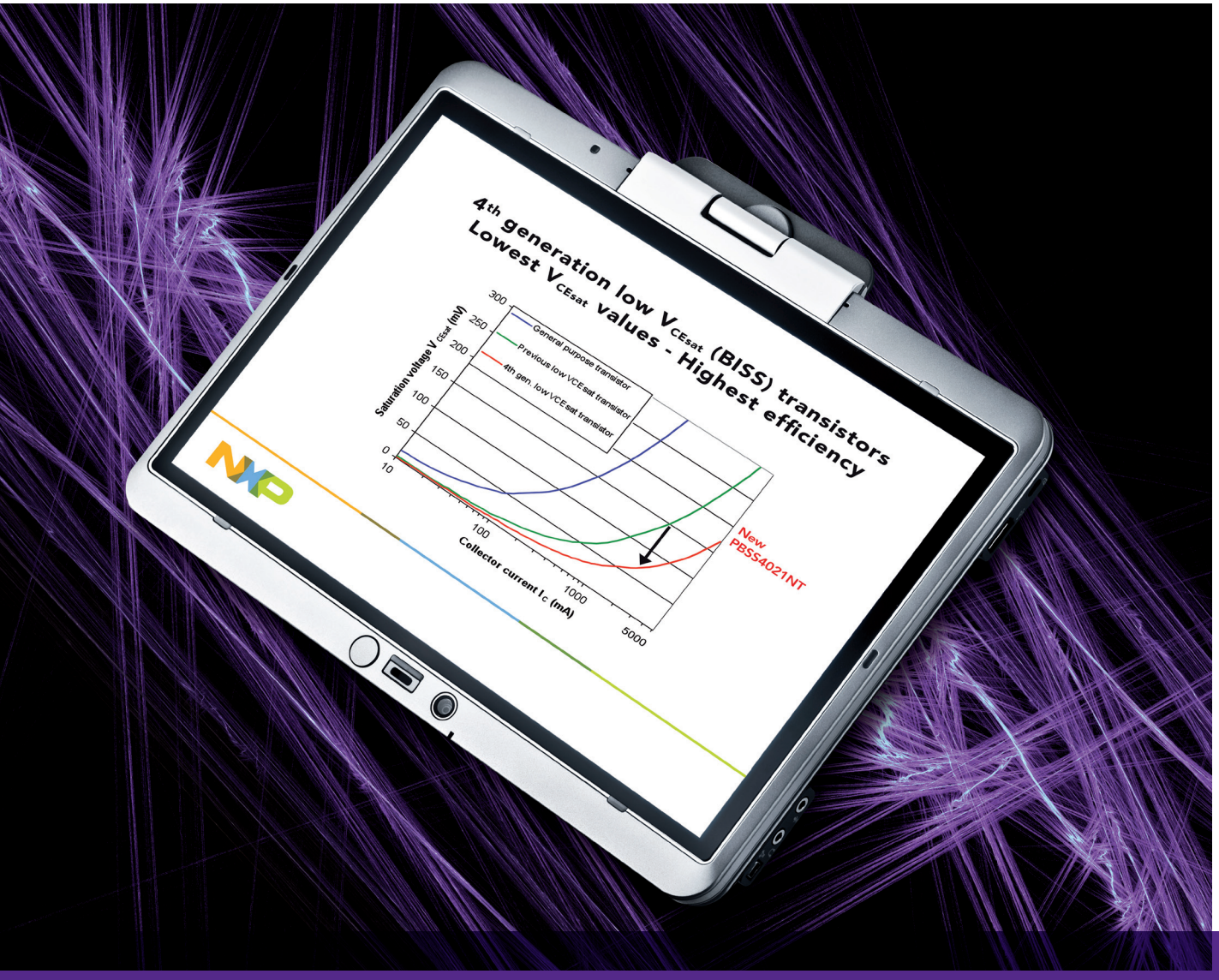


The most efficient low V_{CEsat} (BISS) transistors

Experience best performance for on-state-resistance and switching times. Choose from NXP's broad portfolio of energy and space saving products.

Low V_{CEsat} (BISS) transistors

Our efficient low V_{CEsat} transistors live up to their name as Breakthrough In Small Signal (BISS) transistors. They offer lower power losses with higher efficiency than their standard transistor counterparts, and they deliver the required performance in smaller packages that save PCB space. Choose from single and double transistors, resistor-equipped transistors (RETs), or load switches, which combine a low V_{CEsat} transistor with a RET in a single package.

Key features

- Low V_{CEsat} and high current capability
- Broad portfolio supports all kinds of applications
- Wide voltage range, including high-voltage types up to 500 V

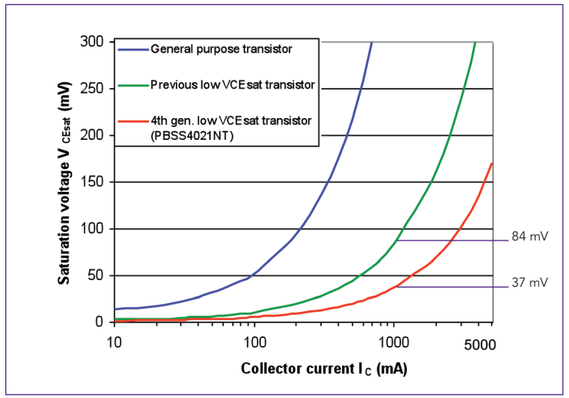
Key benefits

- Optimum power performance while saving space
- Very small packages enable integration of more functions onto a PCB
- Less heat generation
- Energy saving
- Fewer components by using modules like RETs, double transistors, and load switches
  - Simpler circuit layouts
  - Lower pick-and-place costs
  - Less board space

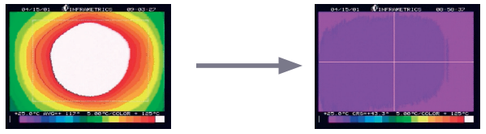
Applications

- Portable applications (mobile phones, DSCs, PDAs, etc.)
- Power management
- Load switches
- Battery chargers
- DC/DC converter
- LED driver circuits in LCD backlight units

Reduced power dissipation due to low V_{CEsat}



65 % heat reduction by BISS transistors



General purpose transistor T_{case} = 110°C

High performance BISS transistor T_{case} = 40°C

Temperature profile of device surface (T_{case}). Comparison of a general purpose transistor and a BISS transistor.

We have shipped more than 1 billion low V_{CEsat} (BISS) transistors. Our portfolio, now in its fourth generation, has been designed into all kinds of applications and is used by most of the top manufacturers

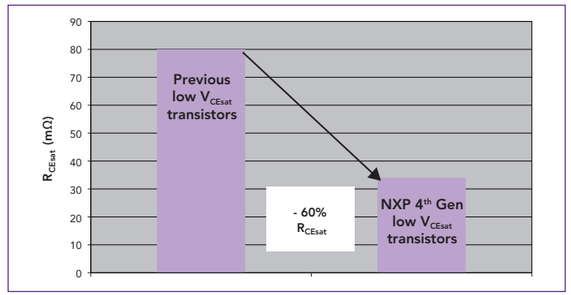
Product News: Fourth-generation technology

Our new, highly efficient 4th generation low V_{CEsat} (BISS) transistors are available in two optimized versions - an ultra-low V_{CEsat} and a high-speed switching version.
The products are available in small SMD packages SOT23, SOT457 (SC-74), SOT89 (SC-62) and SOT223 (SC-73) for single and SOT96 (SO-8) for double transistors.

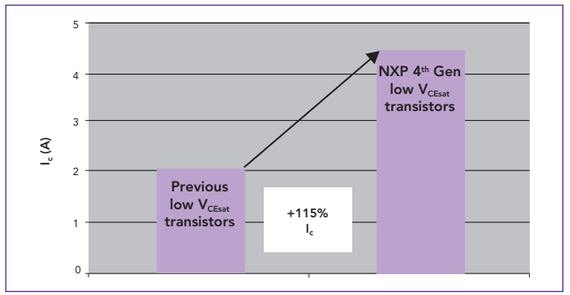
Ultra-low V_{CEsat} devices optimized for load-switch applications

- These devices introduce a new ultra-low-ohmic substrate technology and a patented chip metallization architecture
- Ultra-low saturation voltage due to on-state-resistance reduced by 60% compared to previous generations of low V_{CEsat} transistors.
- Electrical performance for low-loss load switching comparable to available products with twice the size due to doubled maximum current capability I_C (+115%)
- Available in 20 V and 60 V versions

Ultra-low on-state-resistance



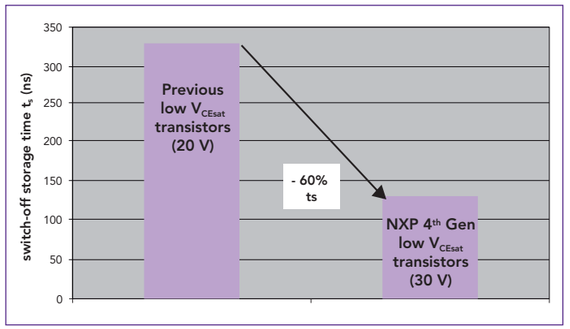
High current capability



Low V_{CEsat} devices optimized for high-speed switching applications

- These devices introduce a new design that combines MESH-emitter technology with base contact extraction electrodes.
- Low on-state resistance down to 50 mΩ, combining high switching performance with minimized saturation voltages and power dissipation – an industry first
- Switching time (t_s) minimized by 60%.

Minimized switching times



Product overview - Ultra-low V_{CEsat} devices, optimized for load-switch applications

Single transistors

Type	Package	Polarity	V_{CEO} (V)	I_C (A)	I_{CM} (A)	RCEsat typ (mΩ) @ I_C; I_C/I_B = 10
PBSS4021NT	SOT23	NPN	20	4.3	8	36
PBSS4021NX	SOT89 (SC-62)			7	15	19
PBSS4021NZ	SOT223 (SC-73)			8	20	14
PBSS4021PT	SOT23	PNP		3.5	8	55
PBSS4021PX	SOT89 (SC-62)			6.2	15	23
PBSS4021PZ	SOT223 (SC-73)			6.6	20	22
PBSS4041NT	SOT23	NPN	60	3.8	8	46
PBSS4041NX	SOT89 (SC-62)			6.2	15	25
PBSS4041NZ	SOT223 (SC-73)			7	15	17.5
PBSS4041PT	SOT23	PNP		2.7	8	80
PBSS4041PX	SOT89 (SC-62)			5	15	40
PBSS4041PZ	SOT223 (SC-73)			5.7	15	29

Double transistors

Type	Package	Polarity	V_{CEO} (V)	I_C (A)	I_{CM} (A)	RCEsat typ (mΩ) @ I_C; I_C/I_B = 10
PBSS4021SN	SOT96 (SO8)	NPN/NPN	20	7.5	15	25
PBSS4021SPN		NPN/PNP		7.5/6.3	15	25/36
PBSS4021SP		PNP/PNP		6.3	15	36
PBSS4041SN		NPN/NPN	60	6.7	15	32
PBSS4041SPN		NPN/PNP		6.7/5.9	15/10	32/47
PBSS4041SP		PNP/PNP		5.9	10	47

Product overview - Low V_{CEsat} devices, optimized for high-speed switching applications

Single transistors

Type	Package	Polarity	V_{CEO} (V)	I_C (A)	I_{CM} (A)	RCEsat typ (mΩ) @ I_C; I_C/I_B = 10
PBSS4032NT	SOT23	NPN	30	2.6	5	76
PBSS4032ND	SOT457 (SC-74)			3.5	6	50
PBSS4032NX	SOT89 (SC-62)			4.7	10	45
PBSS4032NZ	SOT223 (SC-73)			4.9	10	45
PBSS4032PT	SOT23	PNP		2.4	5	110
PBSS4032PD	SOT457 (SC-74)			2.7	5	88
PBSS4032PX	SOT89 (SC-62)			4.2	10	58
PBSS4032PZ	SOT223 (SC-73)			4.4	10	58

Double transistors

Type	Package	Polarity	V_{CEO} (V)	I_C (A)	I_{CM} (A)	RCEsat typ (mΩ) @ I_C; I_C/I_B = 10
PBSS4032SN	SOT96 (SO8)	NPN/NPN	30	5.7	10	45
PBSS4032SP		PNP/PNP		4.8	10	65
PBSS4032SPN		NPN/PNP		5.7/4.8	10	45/65

Package overview with body size

SOT23
2.9 x 1.3 x 1.0 mm

SOT457 (SC-74)
2.9 x 1.5 x 1.0 mm

SOT89 (SC-62)
4.5 x 2.5 x 1.5 mm

SOT223 (SC-73)
6.5 x 3.5 x 1.65 mm

SOT96 (SO8)
4.9 x 3.9 x 1.75 mm

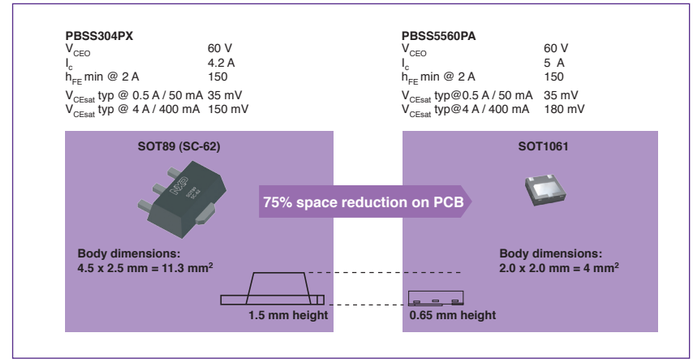
Package dimensions are not true to scale

Product News: Low V_{CEsat} (BISS) transistors in SOT1061 package

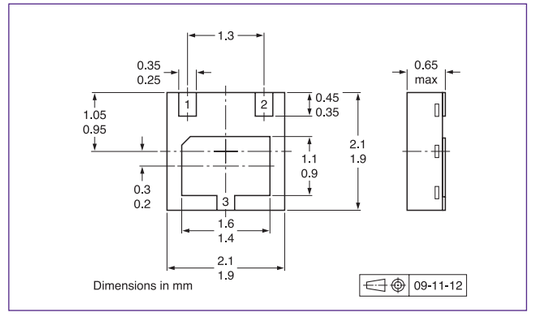
Key features

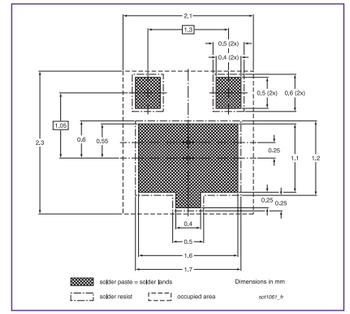
- Exposed heat sink for excellent thermal and electrical conductivity
- Power dissipation capability (P_{tot}) of > 1 W
- Small footprint of 2 x 2 mm and height of 0.65 mm
- Ideal for mobile and battery-driven applications

Performance comparison SOT1061 versus SOT89



SOT1061 minimized outline and solder pattern





Low V_{CEsat} (BISS) transistors in SOT1061

Type	Polarity	V_{CEO} (V)	I_C (A)	I_{CM} (A)	h_{FE} (min/typ)	R_{CEsat} typ (mΩ); @ I_C; I_C/I_B = 20	V_{CEsat} typ (mV) @ I_C=0,5 A; I_B=50 mA	V_{CEsat} max (mV) @ I_C; I_C/I_B = 20
PBSS4612PA	NPN	12	6.0	7.0	280/440	33	20	275
PBSS4620PA		20	6.0	7.0	280/440	33	20	275
PBSS4330PA		30	3.0	5.0	300/465	75*	40	300*
PBSS4630PA		30	6.0	7.0	280/450	35	21	275
PBSS4560PA		60	6.0	7.0	280/440	34	22	290
PBSS4580PA		80	5.6	7.0	270/425	40	25	320
PBSS8510PA		100	5.2	6.0	180/285	48	30	340
PBSS5612PA	PNP	12	6.0	7.0	220/335	33	20	300
PBSS5620PA		20	6.0	7.0	230/345	39	25	350
PBSS5330PA		30	3.0	5.0	200/320	75*	45	320*
PBSS5630PA		30	6.0	7.0	230/345	39	25	350
PBSS5560PA		60	5.0	6.0	180/265	35	35	450
PBSS5580PA		80	4.0	5.0	180/265	65	40	420
PBSS9410PA		100	2.7	4.0	180/295	110	45	450

* IC/IB = 10

The complete portfolio

Low V_{CEsat} (BISS) transistors single NPN

types in **bold** represent new products

Package											SOT223 (SC-73)	SOT89 (SC-62)	SOT457 (SC-74)		SOT23	SOT1061	SOT323 (SC-70)	SOT363 (SC-88)	SOT416 (SC-75)	SOT666	SOT883 (SC-101)
																					
Size (mm)											6.5 x 3.5 x 1.65	4.5 x 2.5 x 1.5	2.9 x 1.5 x 1.0		2.9 x 1.3 x 1.0	2.0 x 2.0 x 0.65	2.0 x 1.25 x 0.95	2.0 x 1.25 x 0.95	1.6 x 0.8 x 0.77	1.6 x 1.2 x 0.55	1.0 x 0.6 x 0.5
P_{tot} (mW)											1700	1650	750		480	1400	350	430	250	500	250
V_{CEO} (V)	**I_C (A)**	**I_{CM} (A)**	**h_{FE} min/typ**	**@ I_C (A)**	**@ V_{CE} (V)**	**R_{CEsat} typ (mΩ); I_C/I_B = 10**	**V_{CEsat} typ (mV); I_C = 0.5 A; I_B = 0.05 A**	**V_{CEsat} max (mV)**	**@ I_C (A)**	**@ I_B (A)**											
12	5.3	10.6	300/530	0.5	2	27 [1]	18	200	5.3	0.265		PBSS301NX									
	5.8	11.6	300/530	0.5	2	29 [1]	18	235	5.8	0.29	PBSS301NZ										
	6.0	7.0	280/440	0.5	2	33 [1]	20	275	6	0.3						**PBSS4612PA**					
15	0.5	1.0	200/325	0.01	2	360	-	250	0.5	0.05											PBSS2515M
			200/425	0.01	2	300	200	250	0.5	0.05									PBSS2515E		
20	1.0	3.0	350/470	0.1	2	220	110 [2]	250	1	0.05					PBSS4120T						
	2.0	4.0	220/410	0.5	2	140	70	350	2	0.2										PBSS4220V	
		5.0	220/330	0.1	2	80	45	310	3	0.3					PBSS4320T						
	3.0	5.0	220/390	0.5	2	85	40	310	3	0.3		PBSS4320X									
	4.0	15.0	300/450	0.5	2	50	30	280	4	0.4			PBSS301ND								
	4.3	8.0	300/550	0.5	2	36	21	220	4	0.2					**PBSS4021NT**						
	5.0	10.0	300/450	0.5	2	32	35	220	5	0.5		PBSS4520X									
	5.3	10.6	300/570	0.5	2	27 [1]	20	200	5.3	0.265		PBSS302NX									
	5.8	10.2	300/570	0.5	2	30 [1]	20	250	5.8	0.29	PBSS302NZ										
	6.0	7.0	280/440	0.5	2	33 [1]	20	275	6	0.3						**PBSS4620PA**					
	7.0	15.0	300/550	0.5	2	19	12	210	7	0.35		**PBSS4021NX**									
	8.0	20.0	300/550	0.5	2	14	9	170	8	0.4	**PBSS4021NZ**										
30	1.0	3.0	300/450	0.5	2	240	120 [2]	270	1	0.05					PBSS4130T						
	2.0	3.0	300/450	0.5	2	120	70	320	2	0.2					PBSS4230T						
	2.6	5.0	300/500	0.5	2	76	80	320	3	0.3					**PBSS4032NT** [3]						
	3.0	5.0	300/490	0.5	2	80	45	300	3	0.3		PBSS4330X									
	3.0	5.0	300/465	0.5	2	75	40	300	3	0.3						**PBSS4330PA**					
	3.5	6.0	300/500	0.5	2	50	70	300	4	0.4			**PBSS4032ND** [3]								
	4.7	10.0	300/500	0.5	2	45	57	250	4	0.4		**PBSS4032NX** [3]									
	5.1	10.2	300/480	0.5	2	30 [1]	20	220	5.1	0.255		PBSS303NX									
	5.4	10.0	300/500	0.5	2	45	57	340	4.9	0.27	**PBSS4032NZ** [3]										
	5.5	11.0	300/480	0.5	2	31 [1]	20	240	5.5	0.275	PBSS303NZ										
	6.0	7.0	280/450	0.5	2	35 [1]	21	275	6	0.3						**PBSS4630PA**					
40	0.5	1.0	200/550	0.01	2	380	200 [2]	250	0.5	0.05											PBSS2540M
			200/350	0.01	2	380	190	250	0.5	0.05									PBSS2540E		
	1.0	3.0	300/ -	0.5	5	150	70	440	2	0.2										PBSS4140V	
		2.0	300/440	0.5	5	240	130	500	1	0.1							PBSS4140U				
			300/510	0.5	5	230	120	500	1	0.1					PMMT491A						
			300/420	0.5	5	150	130	500	1	0.1					PBSS4140T						
	2.0	3.0	300/400	0.5	5	150	70	400	2	0.2										PBSS4240V	
			350/470	0.1	2	120	70	320	2	0.2								PBSS4240Y			
			300/450	0.5	2	120	70	320	2	0.2					PBSS4240T						
	4.0	15.0	300/520	0.5	2	55	35	300	4	0.4			PBSS302ND								
		10.0	300/500	0.5	2	40	21	355	5	0.5		PBSS4540X									
	5.0	10.0	300/500	0.5	2	42	25	355	5	0.5	PBSS4540Z										
50	2.0	5.0	300/495	0.5	2	100	60	260	2	0.2					PBSS4350T						
			300/ -	0.5	2	160	90 [2]	320	2	0.2		PBSS4250X									
	3.0	5.0	200/280	0.5	2	110	65	290	2	0.2			PBSS4350D								
			300/460	0.5	2	75	50	370	3	0.3		PBSS4350X									
			200/280	0.5	2	110	60 [1]	290	2	0.2	PBSS4350Z										
60	1.0	2.0	200/400	0.5	5	200	110	250	1	0.1										PBSS4160V	
			200/420	0.5	5	230	120	280	1	0.1							PBSS4160U				
			200/350	0.5	5	200	110	250	1	0.1					PBSS4160T						
	3.0	6.0	345/570	0.5	2	65	40	260	3	0.3			PBSS303ND								
	3.8	8.0	300/500	0.5	2	46	29	200	3	0.3					**PBSS4041NT**						
	4.7	9.4	300/520	0.5	2	37 [1]	25	245	4.7	0.235		PBSS304NX									
	5.2	10.4	300/520	0.5	2	39 [1]	25	280	5.2	0.26	PBSS304NZ										
	6.0	7.0	280/440	0.5	2	34 [1]	22	290	6	0.3						**PBSS4560PA**					
	6.2	15.0	300/500	0.5	2	25	17	230	6	0.3		**PBSS4041NX**									
	7.0	15.0	300/500	0.5	2	17.5	13	195	7	0.35	**PBSS4041NZ**										
80	3.0	6.0	240/360	0.5	2	67	40	255	3	0.3			PBSS304ND								
	4.0	10.0	250/400	0.5	2	43 [1]	25	230	4	0.2		PBSS4480X									
	4.6	9.2	300/470	0.5	2	37 [1]	25	240	4.6	0.23		PBSS305NX									
	5.1	10.2	300/470	0.5	2	38 [1]	25	270	5.1	0.255	PBSS305NZ										
	5.6	7.0	270/425	0.5	2	40 [1]	25	320	5.6	0.28						**PBSS4580PA**					
100	1.0	3.0	150/400	0.25	10	160	80	200	1	0.1								PBSS8110Y			
			150/300	0.25	10	165	70	200	1	0.1					PBSS8110T						
			150/290	0.25	10	160	75	200	1	0.1			PBSS8110D								
			150/290	0.25	10	165	73	200	1	0.1		PBSS8110X									
			150/290	0.25	10	160	73	200	1	0.1	PBSS8110Z										
	3.0	4.0	170/275	0.5	2	72	45	360	4	0.4			PBSS305ND								
	4.5	9.0	200/330	0.5	2	38 [1]	27	245	4.5	0.225		PBSS306NX									
	5.1	10.2	200/330	0.5	2	43 [1]	27	300	5.1	0.255	PBSS306NZ										
	5.2	6.0	180/285	0.5	2	48 [1]	30	340	5.2	0.26						**PBSS8510PA**					

[1] I_C/I_B = 20
[2] V_{CEsat} (max)
[3] optimized for high speed switching

The complete portfolio

Low V_{CEsat} (BISS) transistors single PNP

types in **bold** represent new products

Package											SOT223 (SC-73)	SOT89 (SC-62)	SOT457 (SC-74)		SOT23	SOT1061	SOT323 (SC-70)	SOT363 (SC-88)	SOT416 (SC-75)	SOT666	SOT883 (SC-101)
																					
Size (mm)											6.5 x 3.5 x 1.65	4.5 x 2.5 x 1.5	2.9 x 1.5 x 1.0		2.9 x 1.3 x 1.0	2.0 x 2.0 x 0.65	2.0 x 1.25 x 0.95	2.0 x 1.25 x 0.95	1.6 x 0.8 x 0.77	1.6 x 1.2 x 0.55	1.0 x 0.6 x 0.5
P_{tot} (mW)											1700	1650	750		480	1400	350	430	250	500	250
V_{CEO} (V)	**I_C (A)**	**I_{CM} (A)**	**h_{FE} min/typ**	**@ I_C (V)**	**@ V_{CE} (V)**	**R_{CEsat} typ (mΩ); I_C/I_B = 10**	**V_{CEsat} typ (mV); I_C = 0.5 A; I_B = 0.05 A**	**V_{CEsat} max (mV)**	**@ I_C (A)**	**@ I_B (A)**											
12	5.3	10.6	250/400	0.5	2	28 [1]	20	210	5.3	0.265		PBSS301PX									
	5.7	11.4	250/400	0.5	2	30 [1]	20	245	5.7	0.285	PBSS301PZ										
	6.0	7.0	220/335	0.5	2	33 [1]	20	300	6	0.3						**PBSS5612PA**					
15	0.5	1.0	200/260	0.01	2	300	150	250	0.5	0.05											PBSS3515M
			200/325	0.01	2	300	150	250	0.5	0.05									PBSS3515E		
20	1.0	2.0	300/450	0.1	2	250	125 [2]	250	1	0.05					PBSS5120T						
	2.0	4.0	220/440	0.1	2	140	75	390	2	0.2										PBSS5220V	
		3.0	225/ -	0.5	2	115	80 [2]	225	2	0.2					PBSS5220T						
		5.0	220/420	0.5	2	75	50	210	2	0.2					PBSS5320T						
	3.0	5.0	200/ -	0.5	2	85	80 [2]	400	3	0.3			PBSS5320D								
			220/450	0.5	2	90	50	300	3	0.3		PBSS5320X									
	3.5	8.0	250/400	0.5	2	55	35	375	4	0.2					**PBSS4021PT**						
	4.0	15.0	250/400	0.5	2	50	35	280	4	0.4			PBSS301PD								
	5.0	10.0	300/430	0.5	2	34	45	270	5	0.5		PBSS5520X									
	5.1	10.2	250/370	0.5	2	32 [1]	25	230	5.1	0.255		PBSS302PX									
	5.5	11.0	250/370	0.5	2	34 [1]	25	265	5.5	0.275	PBSS302PZ										
	6.0	7.0	230/345	0.5	2	39 [1]	25	350	6	0.3						**PBSS5620PA**					
	6.2	15.0	250/400	0.5	2	23	18	240	6	0.3		**PBSS4021PX**									
	6.6	20.0	250/400	0.5	2	22	16	240	7	0.35	**PBSS4021PZ**										
30	1.0	3.0	260/350	0.5	2	220	110	225	1	0.05					PBSS5130T						
	2.0	3.0	300/450	0.1	2	160	70	350	2	0.2					PBSS5230T						
	2.4	5.0	200/320	0.5	2	110	95	330	2	0.2					**PBSS4032PT** [3]						
	2.7	5.0	200/350	0.5	2	88	87	395	3	0.3			**PBSS4032PD** [3]								
	3.0	5.0	200/380	0.5	2	80	50	320	3	0.3		PBSS5330X									
	3.0	5.0	200/320	0.5	2	75	45	320	3	0.3						**PBSS5330PA**					
	4.2	10.0	200/350	0.5	2	58	70	345	4	0.4		**PBSS4032PX** [3]									
	4.4	10.0	200/350	0.5	2	58	70	400	4	0.2	**PBSS4032PZ** [3]										
	5.1	10.2	250/400	0.5	2	32 [1]	25	230	5.1	0.255		PBSS303PX									
	5.3	10.6	250/400	0.5	2	35 [1]	25	265	5.3	0.265	PBSS303PZ										
	6.0	7.0	200/335	0.5	2	39 [1]	25	350	6	0.3						**PBSS5630PA**					
40	0.5	1.0	200/380	0.01	2	440	220	350	0.5	0.05											PBSS3540M
			200/380	0.01	2	440	230	350	0.5	0.05									PBSS3540E		
	1.0	2.0	300/ -	0.1	5	200	120	310	1	0.1										PBSS5140V	
			300/520	0.1	5	230	130	500	1	0.1							PBSS5140U				
			300/800	0.1	5	250	130	500	1	0.1					PMMT591A						
			300/510	0.1	5	230	130	500	1	0.1					PBSS5140T						
	1.8	3.0	300/450	0.1	5	185	100	530	2	0.2										PBSS5240V	
	2.0	3.0	300/ -	0.1	2	200	110 [2]	350	2	0.2								PBSS5240Y			
			300/450	0.1	2	150	70	350	2	0.2					PBSS5240T						
	4.0	15.0	200/310	0.5	2	55	46	300	4	0.4			PBSS302PD								
		10.0	250/370	0.5	2	45	33	375	5	0.5		PBSS5540X									
	5.0	10.0	250/350	0.5	2	55	40 [1]	160	2	0.2	PBSS5540Z										
50	2.0	3.0	200/ -	0.5	2	150	90 [2]	300	2	0.1					PBSS5250T						
		5.0	200/360	0.5	2	90	55	270	2	0.2					PBSS5350T						
			200/ -	0.5	2	160	90 [2]	320	2	0.2		PBSS5250X									
	3.0	5.0	200/300	0.5	2	120	70	300	2	0.2			PBSS5350D								
			200/375	0.5	2	120	70	390	3	0.3		PBSS5350X									
			200/300	0.5	2	120	70	300	2	0.2	PBSS5350Z										
60	1.0	2.0	150/250	0.5	5	220	120	330	1	0.1										PBSS5160V	
			150/250	0.5	5	255	135	340	1	0.1							PBSS5160U				
			150/250	0.5	5	220	120	330	1	0.1					PBSS5160T						
	2.7	8.0	200/300	0.5	2	80	49	360	3	0.3					**PBSS4041PT**						
	3.0	6.0	180/265	0.5	2	70	55	290	3	0.3			PBSS303PD								
	4.2	8.4	200/295	0.5	2	53 [1]	35	310	4.2	0.21		PBSS304PX									
	4.5	9.0	200/295	0.5	2	59 [1]	35	375	4.5	0.225	PBSS304PZ										
	5.0	6.0	170/260	0.5	2	35 [1]	35	450	5	0.25						**PBSS5560PA**					
		15.0	200/300	0.5	2	40	30	300	5	0.5		**PBSS4041PX**									
	5.7	15.0	200/300	0.5	2	29	22	285	6	0.3	**PBSS4041PZ**										
80	3.0	5.0	155/225	0.5	2	71	55	290	3	0.3			PBSS304PD								
	4.0	5.0	180/265	0.5	2	65 [1]	40	420	4	0.2						**PBSS5580PA**					
		10.0	200/300	0.5	2	50	35	380	5	0.5		PBSS5480X									
		8.0	200/280	0.5	2	43	36	240	4	0.4		PBSS305PX									
	4.5	9.0	200/280	0.5	2	69 [1]	36	450	4.5	0.225	PBSS305PZ										
100	1.0	3.0	150/ -	0.25	5	170	93	320	1	0.1								PBSS9110Y			
			150/350	0.5	5	170	95	320	1	0.1					PBSS9110T						
			150/350	0.5	5	170	100	320	1	0.1			PBSS9110D								
			150/350	0.5	5	170	90	320	1	0.1		PBSS9110X									
			150/ -	0.5	5	170	90	320	1	0.1	PBSS9110Z										
	2.0	3.0	175/275	0.5	2	88	65	250	2	0.2			PBSS305PD								
	2.7	4.0	180/295	0.5	2	110 [1]	45	450	2.7	0.135						**PBSS9410PA**					
	3.7	7.4	200/300	0.5	2	52	45	300	4	0.4		PBSS306PX									
	4.1	8.2	200/300	0.5	5	57	45	325	4.1	0.41	PBSS306PZ										

[1] I_C/I_B = 20
[2] V_{CEsat} (max)
[3] optimized for high speed switching

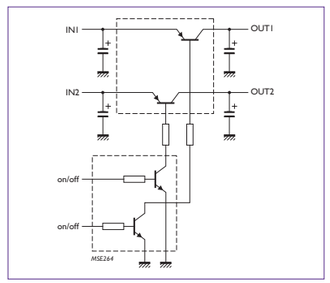
Low V_{CEsat} (BISS) transistors double

types in **bold** represent new products

Package										SOT96 (SO8)	SOT457 (SC-74)	SOT363 (SC-88)	SOT666
													
Size (mm)										4.9 x 3.9 x 1.75	2.9 x 1.5 x 1.0	2.0 x 1.25 x 0.95	1.6 x 1.2 x 0.55
P_{tot} (mW)										2000 [2]	750	430	500
V_{CEO} (V)	**I_C (A)**	**Polarity**	**h_{FE} min**	**@ I_C (A)**	**@ V_{CE} (V)**	**V_{CEsat} typ (mV); I_C = 0.5 A; I_B = 0.05 A**	**V_{CEsat} max (mV)**	**@ I_C (A)**	**@ I_B (A)**				
15	0.5	2 x NPN	200	0.01	2	170 [1]	250	0.5	0.05				PBSS2515VS
		2 x PNP	200	0.01	2	170 [1]	250	0.5	0.05				PBSS3515VS
		NPN/PNP	200	0.01	2	170 [1]	250	0.5	0.05				PBSS2515VPN
		NPN/PNP	200	0.01	2	170 [1]	250	0.5	0.05			PBSS2515YPN	
20	7.5	NPN/NPN	300	0.5	2	15	150	4	0.2	**PBSS4021SN**			
	6.3	PNP/PNP	250	0.5	2	24	225	4	0.2	**PBSS4021SP**			
	7.5 / 6.3	NPN/PNP	300/250	0.5	2	15/24	150/225	4	0.2	**PBSS4021SPN**			
30	5.7	NPN/NPN	300	0.5	2	57	250	4	0.4	**PBSS4032SN** [3]			
	4.8	PNP/PNP	200	0.5	2	70	390	4	0.4	**PBSS4032SP** [3]			
	5.7 / 4.8	NPN/PNP	300/200	0.5	2	57/70	250/390	4	0.4	**PBSS4032SPN** [3]			
40	1.0	NPN/PNP	300/250	0.5	5	130/150	500	1	0.1		PBSS4140DPN		
	2.0	NPN/PNP	300/250	0.5	5	80/100	400/530	2	0.2		PBSS4240DPN		
50	2.7	2 x NPN	300	0.5	2	50	340	2.7	0.27	PBSS4350SS			
		2 x PNP	200	0.5	2	60	370	2.7	0.27	PBSS5350SS			
		NPN/PNP	300/200	0.5	2	50/60	340/370	2.7	0.27	PBSS4350SPN			
60	1.0	2 x NPN	200	0.5	5	115	250	1	0.1		PBSS4160DS		
		2 x PNP	150	0.5	5	120	330	1	0.1		PBSS5160DS		
		NPN/PNP	200/150	0.5	5	115/120	250/330	1	0.1		PBSS4160DPN		
	6.7	NPN/NPN	300	0.5	2	20	190	4	0.2	**PBSS4041SN**			
	5.9	PNP/PNP	200	0.5	2	35	330	4	0.2	**PBSS4041SP**			
	6.7 / 5.9	NPN/PNP	300/200	0.5	2	20/35	190/330	4	0.2	**PBSS4041SPN**			

[1] I_c/I_b=20
[2] Device mounted on a ceramic PCB, Al2O3, standard footprint.
[3] Optimized for high speed switching

Dual load switch using double BISS transistors and double RETs

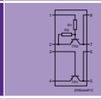
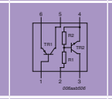
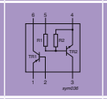


Low V_{CEsat} (BISS) RETs

Package					SOT23	
						
Size (mm)					2.9 x 1.3 x 1.0	
P_{tot} (mW)					250	
V_{CEO} (V)	**I_C (mA)**		**R1 (kΩ)**	**R2 (kΩ)**	NPN	PNP
40	600	R1 = R2	1	1	PBRN113ET	PBRP113ET
			2.2	2.2	PBRN123ET	PBRP123ET
		R1 ≠ R2	1	10	PBRN113ZT	PBRP113ZT
			2.2	10	PBRN123YT	PBRP123YT

Low V_{CEsat} (BISS) load switches

types in **bold** represent new products

Package				SOT96 (SO8)	SOT457 (SC-74)		SOT363 (SC-88)	SOT666
								
Size (mm)				4.9 x 3.9 x 1.75	2.9 x 1.5 x 1.0		2.0 x 1.25 x 0.95	1.6 x 1.2 x 0.55
P_{tot} (mW)				1500 [1]	750 [1]	600 [1]	300 [2]	300 [2]
V_{CEO} (V)	**I_C (A)**	**V_{CEsat} max (mV); I_C = 0.5A; I_B = 0.05A**	**R1, R2 (kΩ)**					
15	0.5	250	2.2				PBLS1501Y	PBLS1501V
			4.7				PBLS1502Y	PBLS1502V
			10				PBLS1503Y	PBLS1503V
			22				PBLS1504Y	PBLS1504V
20	1	150	2.2			PBLS2001D		
			4.7			PBLS2002D		
			10			PBLS2003D		
			22			PBLS2004D		
	1.8	70	2.2		**PBLS2021D**			
			4.7		**PBLS2022D**			
			10		**PBLS2023D**			
			22		**PBLS2024D**			
	3	75	2.2	PBLS2001S				
			4.7	PBLS2002S				
			10	PBLS2003S				
40	0.5	350	2.2				PBLS4001Y	PBLS4001V
			4.7				PBLS4002Y	PBLS4002V
			10				PBLS4003Y	PBLS4003V
			22				PBLS4004Y	PBLS4004V
			47				PBLS4005Y	PBLS4005V
	1	170	2.2			PBLS4001D		
			4.7			PBLS4002D		
			10			PBLS4003D		
			22			PBLS4004D		
			47			PBLS4005D		
60	1	180	2.2			PBLS6001D		
			4.7			PBLS6002D		
			10			PBLS6003D		
			22			PBLS6004D		
			47			PBLS6005D		
	1.5	100	2.2		**PBLS6021D**			
			4.7		**PBLS6022D**			
			10		**PBLS6023D**			
			22		**PBLS6024D**			

[1] Device mounted on a ceramic PCB, Al_2O_3, standard footprint
[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint

Key features

- Low V_{CEsat} (BISS) transistor and resistor-equipped transistor (RET) in one package
- Low saturation voltage
- Low 'threshold' voltage (< 1 V) compared to MOSFET
- Low drive power required
- Range of small, very small and ultra small packages

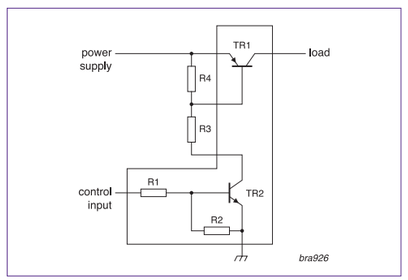
Key benefits

- Smaller end products
- Reduced component count
- Less sourcing effort
- Fewer solder points increase reliability
- Cost reduction
- More efficient, cooler running systems

Key applications

- Supply line switch
- Battery charger
- High-side switch for LEDs, drivers and backlights
- Portable equipment

BISS load switch



High voltage low V_{CEsat} (BISS) transistors

types in **bold** represent new products

Package				SOT223 (SC-73)	SOT89 (SC-62)	SOT23
						
Size (mm)				6.5 x 3.5 x 1.65	4.5 x 2.5 x 1.5	2.9 x 1.3 x 1.0
P_{tot} (mW)				1700	1300	250
Polarity	**V_{CESM} [1]**	**V_{CEO} (V)**	**I_C (A)**			
NPN	-	150	1	PBHV8115Z		PBHV8115T
			2	**PBHV8215Z**		
	500	400	0.5	PBHV8540Z		PBHV8540T
			1	**PBHV8140Z**		
		500	0.15			**PMBTA45**
			0.4	**PBHV8550Z**		
PNP	-	150	1	PBHV9115Z	**PBHV9115X**	PBHV9115T
			2	**PBHV9215Z**		
	500	400	0.25	PBHV9040Z		PBHV9040T
			0.5	**PBHV9540Z**		
		500	0.15			**PBHV9050T**
			0.25	**PBHV9050Z**		

[1] Collector-emitter peak voltage

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