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What is "Embedded - Microcontrollers"?

"Embedded - Microcontrollers" refer to small, integrated circuits designed to perform specific tasks within larger systems. These microcontrollers are essentially compact computers on a single chip, containing a processor core, memory, and programmable input/output peripherals. They are called "embedded" because they are embedded within electronic devices to control various functions, rather than serving as standalone computers. Microcontrollers are crucial in modern electronics, providing the intelligence and control needed for a wide range of applications.

Applications of "Embedded - Microcontrollers"

Details	
Product Status	Active
Core Processor	HCS12
Core Size	16-Bit
Speed	32MHz
Connectivity	EBI/EMI, I²C, IrDA, LINbus, SCI, SPI
Peripherals	LCD, Motor control PWM, POR, PWM, WDT
Number of I/O	80
Program Memory Size	48KB (48K x 8)
Program Memory Type	FLASH
EEPROM Size	4K x 8
RAM Size	4K x 8
Voltage - Supply (Vcc/Vdd)	4.5V ~ 5.5V
Data Converters	A/D 8x10b
Oscillator Type	Internal
Operating Temperature	-40°C ~ 85°C (TA)
Mounting Type	Surface Mount
Package / Case	100-LQFP
Supplier Device Package	100-LQFP (14x14)
Purchase URL	https://www.e-xfl.com/product-detail/nxp-semiconductors/s9s12ha48j0cll

Our commitment: quality and reliability

AEC-Q101

- We qualify our products according to the automotive AEC-Q101 standard and even exceed it's requirements, for instance when doing extended lifetime testing.

goforQuality
customer focused passion to win

- All our processes and manufacturing plants are subject to regular international and internal audits, including the following:
  - ISO9001
  - ISO/TS 16949 for automotive sites
  - ISO14001
  - OHSAS18001

DfX
EXCELLENCE

- NXP's Design for Excellence (DfX) program ensures that each new development builds on past learning and that best practices are always employed. The result is continual product improvement.

ZD
ZERO DEFECT

- Zero defect is our goal. To ensure continuous improvement failure analysis and the determination to find root causes is performed at all stages of development and production by adoption of quality-analysis tools and methods (e.g. Six-Sigma, Safe-Launch).

Rigorous attention to detail and commitment to quality have yielded a very low product failure rate of a single-digit part per billion (ppb).

Bipolar transistors

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High-voltage low V_{CEsat} (BISS) transistors

types in **bold** represent new products

Package			SOT223 (SC-73)	SOT89 (SC-62)	SOT1215	SOT23
Size (mm)			6.5 x 3.5 x 1.65	4.5 x 2.5 x 1.5	1.1 x 1.0 x 0.37	2.9 x 1.3 x 1.0
P_{tot} (mW)			1700	1300	750	250
Polarity	V_{CEO} (V)	I_C (A)				
NPN	150	0.5			**PBHV8115QA**	
		1	PBHV8115Z	PBHV8115X		PBHV8115T
		2	PBHV8215Z			
	180	1				PBHV8118T
	400	0.5	PBHV8540Z	PBHV8540X		PBHV8540T
		1	PBHV8140Z			
	500	0.15				PMBTA45
	600	0.5	PBHV8560Z			
PNP	140	4	PBHV9414Z			
	150	0.5			**PBHV9115QA**	
		1	PBHV9115Z	PBHV9115X		PBHV9115T
		2	PBHV9215Z			
	600	0.5	PBHV9560Z			
		0.1	PBHV3160Z			
	400	0.25	PBHV9040Z	PBHV9040X		PBHV9040T
		0.5	PBHV9540Z			
	500	0.15	PBHV3160Z			PBHV9050T
		0.25	PBHV9050Z			

In the spotlight

High-voltage low V_{CEsat} (BISS) transistors in SOT223, SOT23 & SOT89

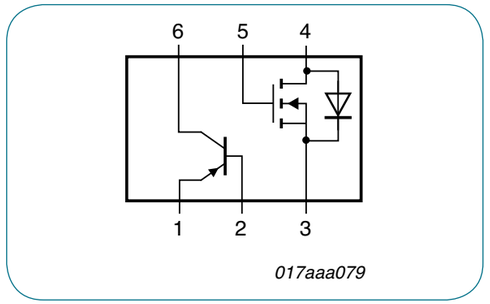
- Voltage V_{CEO} up to 600 V
- Current I_C up to 4 A (continuous), 10 A (peak)
- V_{CEsat} down to 33 mV
- AEC-Q101 qualified
- New high-voltage low VCEsat (BISS) in DFN1010D-3

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) transistor PNP – N-channel MOSFET combination

Package											DFN2020-6 (SOT1118)
Size (mm)											2.0 x 2.0 x 0.62
P_{tot} (mW)											1300
V_{CEO} (V)	I_C (A)	h_{FE} min	h_{FE} max	@ I_C (mA)	@ V_{CE} (V)	R_{CEsat} typ (mΩ)	V_{DS} (V)	V_{GS} (V)	I_D (A)	R_{Dson} typ (mΩ)	
40	2	300	800	100	5	240	30	0.7	0.66	390	PBSM5240PF
		100	-	100	5	240	30	0.7	0.66	390	PBSM5240PFH



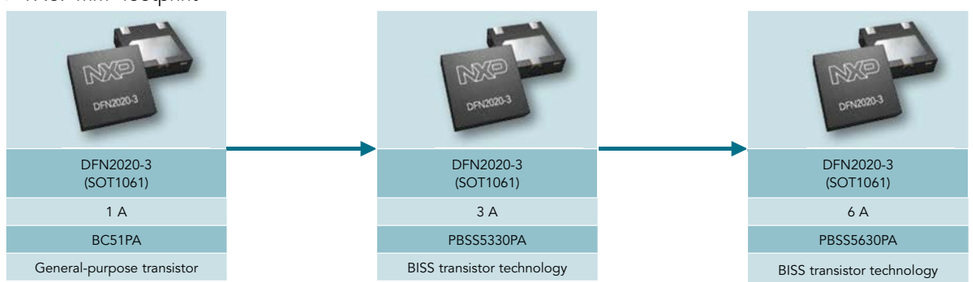
Combination of low V_{CEsat} transistor with N-channel MOSFET in the very small and ultrathin leadless package DFN2020-6 (SOT1118)

Advantages of low V_{CEsat} (BISS) technology

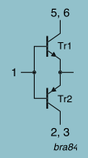
Our BISS (Breakthrough In Small-Signal) transistors show lowest V_{CEsat} values due to an innovative mesh-emitter technology and further technology improvement. They also reduce board space due to improved collector- current capabilities as shown below.

Improved collector-current capabilities

- 17.87 mm² footprint



MOSFET driver

V_{CEO} (V)	I_C (A)	I_{cm} [A]	Type	Package	Remark	Configuration
30	0.1	0.2	BCV65	SOT143B	General-purpose transistors	
40	0.6	1	PMD2001D	SOT457	Switching transistors with reduced storage time	
	1	2	PMD3001D		Low V_{CEsat}	

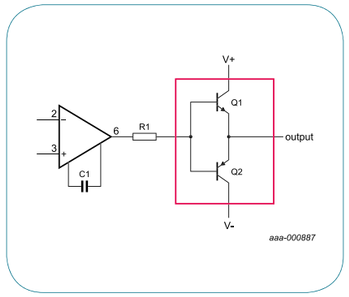
Key features and benefits

- Three different configurations
- Types available with standard, switching, and low V_{CEsat} (BISS) transistors
- Small footprint

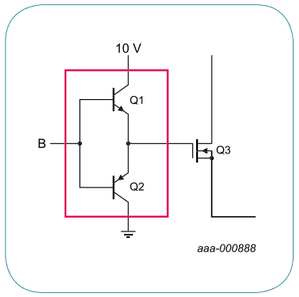
Key applications

- Power management
  - (Half) bridge push-pull driver
  - Isolated DC/DC converters
  - Secondary synchronous rectification
- Peripheral driver
  - (Half) bridge push-pull driver
  - Motor driver
  - Brushless DC motor driver
  - Op-amp output current booster

Op-amp booster



MOSFET driver for faster switching, lower losses



Medium-frequency transistors

Package						SOT23	SOT323 (SC-70)
Size (mm)						2.9 x 1.3 x 1.0	2.0 x 1.25 x 0.95
P_{tot} (mW)						250	200
Polarity	V_{CEO} (V)	I_C (mA)	h_{FE} min	h_{FE} max	f_T typ (MHz)		
NPN	15	100	40	-	500	BF570	
	20	25		85	>275	BFS20	BFS20W
		30	65	225	260	BFS19	
	40	25	67	220	380	BF840	
PNP	30	25	25	50	250	BF824	BF824W
	40		50	-	>325	BF550	

Diodes

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General-purpose high-speed switching diodes < 90 V

types in **bold** represent new products

V_R max (V)	V_F max (V)	@ I_F (mA)	I_R max (nA)	@ V_R (V)	t_{rr} max (ns)	Package	SOD80C (MiniMelf)	SOT23	SOT143B	SOT323 (SC-70)	SOT363 (SC-88)	DFN1010D-3 (SOT1215)	DFN1006-3 (SOT883)
						Size (mm)	3.5 x 1.5 x 1.5	2.9 x 1.3 x 1.0	2.9 x 1.3 x 1.0	2.0 x 1.25 x 0.95	2.0 x 1.25 x 0.95	1.1 x 1.0 x 0.37	1.0 x 0.6 x 0.48
						P_{tot} (mW)	500	250	250	200	300	540	250
50	1	50	100	50	4			BAL74					
								BAV74					
70	1	50	1000	70	4			BAL99					
75	1	50	1000	75	4				BAS28				
		100	5000	75	4		BAS32L						
80	1	50	500	80	4					1PS300			
										1PS301			
										1PS302			
90	1	50	500	80	4			BAW56		BAW56W		**BAW56QA**	BAW56M
											BAW56S		
											BAV756S		

General-purpose, high-speed switching diodes 100 V

types in **bold** represent new products

V_R max (V)	V_F max (V)	@ I_F (mA)	I_R max (nA)	@ V_R (V)	t_{rr} max (ns)	Package	SOT23	SOD123F	SOT323 (SC-70)	SOT363 (SC-88)	SOD323 (SC-76)	SOD323F (SC-90)	SOT666	SOD523 (SC-79)	DFN1010D-3 (SOT1215)	DFN1006-2 (SOD882)	DFN1006-3 (SOT883)	DFN1006D-2 (SOD882D)
						Size (mm)	2.9 x 1.3 x 1.0	2.6 x 1.6 x 1.1	2.0 x 1.25 x 0.95	2.0 x 1.25 x 0.95	1.7 x 1.25 x 0.95	1.7 x 1.25 x 0.7	1.6 x 1.2 x 0.55	1.2 x 0.8 x 0.6	1.1 x 1.0 x 0.37	1.0 x 0.6 x 0.48	1.0 x 0.6 x 0.48	1.0 x 0.6 x 0.37
						P_{tot} (mW)	250	830	200	300	400	550	180	500	540	250	250	250
100	1	50	500	80	4			BAS16H			BAS316	BAS16J		BAS516		BAS16L		BAS16LD
							BAS16		BAS16W						**BAS16QA**			
										BAS16VY			BAS16VV					
							BAV70		BAV70W						**BAV70QA**		BAV70M	
										BAV70S								
							BAV99		BAV99W						**BAV99QA**			
										BAV99S								

General-purpose switching diodes ≥ 100 V

types in **bold** represent new products

V_R max (V)	V_F max (V)	@ I_F (mA)	I_R max (nA)	@ V_R (V)	t_{rr} max (ns)	Package	SOD80C (MiniMelf)	SOT457 (SC-74)	SOT23	SOT143B	SOD123F	SOT323 (SC-70)	SOT353 (SC-88A)	SOT363 (SC-88)	SOD323 (SC-76)	SOD323F (SC-90)	SOD523 (SC-79)
						Size (mm)	3.5 x 1.5 x 1.5	2.9 x 1.5 x 1.0	2.9 x 1.3 x 1.0	2.9 x 1.3 x 1.0	2.6 x 1.6 x 1.1	2.0 x 1.25 x 0.95	2.0 x 1.25 x 0.95	2.0 x 1.25 x 0.95	1.7 x 1.25 x 0.95	1.7 x 1.25 x 0.7	1.2 x 0.8 x 0.6
						P_{tot} (mW)	300	500	250	250	830	350		300	400	550	500
100	1	100	100	100	50				BAS19								
150	1	100	100	150	50		BAV102										
									BAS20								
≥ 200	1	100	100	150	50		BAV103				BAS21H				BAS321		
				200	50				BAS21			BAS21W					
										BAV23							
													BAS21PG				
									BAV23A			BAS21AW					
									BAV23C								
									BAV23S			BAS21SW					
								BAS21AVD									
								BAS21VD									
300	1.1	100	150	250	50											BAS21J	BAS521
									BAS101								
									BAS101S								
										BAW101							
														BAW101S			

PN-rectifier

V_R max (V)	V_F max (V)	(@) I_F (A)	IR max (µA)	(@) V_R (V)	trr max (ns)	Package	CFP3 SOD123W
						Size (mm)	2.6 x 1.7 x 1.0
						P_{tot} (mW)	950
400	1.1	1	1	400	1800		PNS40010ER

In the spotlight

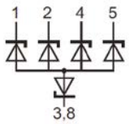
Dual high-speed switching diode BAS21PG in SOT353 (SC-88A)

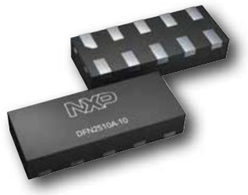
- V_R max = 250 V, I_F max = 225 mA, dual isolated configuration
- Low leakage current: I_R max = 100 nA
- High-speed switching: t_{rr} max = 50 ns
- Low capacitance: C_d max = 2 pF
- AEC-Q101 qualified

In the spotlight

PUSB3AB4 - ESD protection in very small DFN2510A-10 package for USB3.1 @ 10 Gbps and Thunderbolt

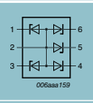
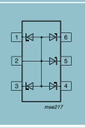
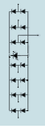
- Protects four very fast data lines of sensitive system chips
- Lowest clamping in the 0.2 pF class
- Very small DFN2510A-10 package (2.5 x 1.0 x 0.48 mm)
- Capacitance < 0.2 pF





Ultra low-capacitance ESD protection devices – Part 4

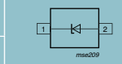
types in **bold** represent new products

Number of protected lines: Unidirectional	Number of protected lines: Bidirectional	V_{RWM} (V)	C_{line} typ (pF)	C_{line} max (pF)	ESD rating [1] max (kV)	I_R max (µA) @ V_{RWM}	Configuration	Type	Package	Size (mm)
4	0	5.5	0.5	-	10	-		IP4294CZ10-TBR	DFN2510A-10 (SOT1176)	2.5 x 1.0 x 0.48
								PUSB3F96		
		3.3	0.27	-	15	0.1		**PUSB3FR4**		
0	3	3.3	0.17	0.2				**PUSB3AB4**		
5	4	5	0.55	0.7	8	0.1		PESD5V0F5UF	DFN1410-6 (SOT886)	1.45 x 1.0 x 0.48
								PESD5V0F5UV	SOT666	1.6 x 1.2 x 0.55
0	6	5.5	0.27	0.35	10	0.1		PUSB3TB6	DFN2111-7 (SOT1358)	2.1 x 1.1 x 0.48
6	0	3.3	0.25	-	15			**PUSB3FR6**		
0	6	3.3	0.15	0.2	15			**PUSB3AB6**		

[1] according to IEC 61000-4-2 (contact discharge)

Low-capacitance ESD protection devices – Part 1

types in **bold** represent new products

Number of protected lines: Unidirectional	Number of protected lines: Bidirectional	V_{RWM} (V)	C_{line} typ (pF)	C_{line} max (pF)	P_{PP} [1] max (W)	ESD rating [2] max (kV)	I_R max (µA) @ V_{RWM}	Configuration	Type	Package	Size (mm)
1	0	3.3	34	40	45	30	0.3		PESD3V3L1UL	DFN1006-2 (SOD882)	1.0 x 0.6 x 0.48
		5	25	30	42	26	0.1		PESD5V0L1UL		
		5	25	30	42	26	0.1		PESD5V0L1ULD	DFN1006D-2 (SOD882D)	1.0 x 0.6 x 0.37
		3.3	34	40	45	30	0.3		PESD3V3L1UB	SOD523 (SC-79)	1.2 x 0.8 x 0.6
		5	25	30	42	26	0.1		PESD5V0L1UB		
		5	25	30	42	26	0.1		PESD5V0L1UA	SOD323 (SC-76)	1.7 x 1.25 x 0.95
		5	12	15	10	30	0.1		PESD5V0L1USF	DSN0603-2 (SOD962)	0.6 x 0.3 x 0.3
		3.3	2.6	3.1	-	9	0.1 (@ 3 V)		PESD3V3U1UL	DFN1006-2 (SOD882)	1.0 x 0.6 x 0.48
		5	2	2.6	-	9	0.1		PESD5V0U1UL		
		3.3	2.6	3.1	-	9	0.1 (@ 3 V)		PESD3V3U1UB	SOD523 (SC-79)	1.2 x 0.8 x 0.6
		5	2	2.6	-	9	0.1		PESD5V0U1UB		
		3.3	2.6	3.1	-	9	0.1 (@ 3 V)		PESD3V3U1UA	SOD323 (SC-76)	1.7 x 1.25 x 0.95
		5	2	2.6	-	9	0.1		PESD5V0U1UA		
0	1	5.5	12	15.4	35	30	0.1		PESD5V0L1BSF	DSN0603-2 (SOD962)	0.6 x 0.3 x 0.3
		3.3	101	-	500	30	2		PESD3V3L1BA	SOD323 (SC-76)	1.7 x 1.25 x 0.95
		5	75	-	500	30	1		PESD5V0L1BA		
		12	19	-	200	30	0.05		PESD12VL1BA		
		15	16	-	200	30	0.05		PESD15VL1BA		
		24	11	-	200	23	0.05		PESD24VL1BA		

[1] 8 / 20 µs exponential decay waveform according to IEC 61000-4-5 and IEC 61643-321

[2] according to IEC 61000-4-2 (contact discharge)

LCD/camera protection and filtering

Baseband interface	Number of protected lines	Line small-signal equivalents			Digital interface clock speed (MHz)	Insertion loss S21 ~ -3 dB (MHz)	Type	Package	Size (mm)
		R_{line} (Ω)	C_{line} (pF)	L_{line} (nH)					
	4	40	18	-	~100	300	IP4252CZ8-4 -TTL	DFN1714-8 (SOT1166)	1.7 x 1.35 x 0.52
		100	45	-	~40	130	IP4254CZ8-4-TTL		
			15	-	~110	330	IP4251CZ8-4-TTL		
		200	45	-	~35	110	IP4253CZ8-4-TTL		
	6	40	18	-	~100	300	IP4252CZ12-6-TTL	DFN2514-12 (SOT1167)	2.5 x 1.35 x 0.53
		100	45	-	~40	130	IP4254CZ12-6-TTL		
			15	-	~110	330	IP4251CZ12-6-TTL		
		200	45	-	~35	110	IP4253CZ12-6-TTL		
		100	54	-	~35	98	PEMI6CSP/RW	WLCSP15	2.36 x 1.05 x 0.61
	8	40	18	-	~100	300	IP4252CZ16-8-TTL	DFN3314-16 (SOT1168)	3.3 x 1.35 x 0.53
		100	45	-	~40	130	IP4254CZ16-8-TTL		
			15	-	~110	330	IP4251CZ16-8-TTL		
		200	45	-	~35	110	IP4253CZ16-8-TTL		
		100	54	-	~35	98	PEMI8CSP/RW/P	WLCSP20	3.16 x 1.05 x 0.61

Audio interface protection and filtering

Baseband interface	Number of protected lines	Line small-signal equivalents		Remark	Type	Package	Size (mm)
		R_{line}	C_{line} (pF)				
Audio	2	-	18	2 line bidirectional with I_{PPM}=9A	PESD5V0V2BM	SOT883	1.0 x 0.6 x 0.48
					PESD5V0V2BMB	SOT883B	1.0 x 0.6 x 0.37
		68 Ω	110	Single-ended or differential microphone	IP4049CX5/LF	WLCSP5	0.91 x 1.28 x 0.65

Memory- and SIM-card protection and filtering

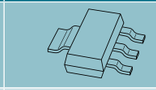
types in **bold** represent new products

Baseband interface	Number of protected lines	Line small-signal equivalents		Digital interface clock speed (MHz)	Remark	Type	Package	Size (mm)
		R_{line}	C_{line} (pF)					
SIM card	3	47 Ω / 100 Ω	20	~20	Integrated SIM-card EMI filter and ESD protection	IP4264CZ8-20-TTL	DFN1714-8 (SOT1166)	1.7 x 1.35 x 0.52
	4	-	1	~240	Quad-channel, low-capacitance ESD protection	IP4221CZ6-S	DFN1410-6 (SOT886)	1.0 x 1.0 x 0.48
					Quad-channel, low-capacitance ESD protection	IP4221CZ6-XS	DFN1010-6 (SOT891)	1.0 x 1.0 x 0.48
SD-card / MMC	6	40 Ω	12	>52	(Mini) SD card/trans flash ESD protection, EMI filter	**IP4252CZ12-6-TTL**	DFN2514-12 (SOT1167)	2.5 x 1.35 x 0.53
		40 Ω / 100 Ω	11	-	6-channel Micro-SD memory-card interface ESD protection filter	IP4340CX15	WLCSP15	1.56 x 1.56 x 0.5
SD 3.0	6	-	0.27	5000	6-line bidirectional ESD protection for ultra high-speed interfaces	**PUSB3TB6**	DFN2111-7 (SOT1358)	2.1 x 1.1 x 0.5
			0.35			**PUSB3FR6**		
			0.15			**PUSB3AB6**		

Small-signal MOSFETs

Small-signal MOSFETs single (N-channel)

types in **bold** represent new products

Package													SOT223	SOT457 (SC-74)	SOT23	SOT323 (SC-70)	DFN1006-3 (SOT883)	DFN1006B-3 (SOT883B)
																		
Size (mm)													6.5 x 3.5 x 1.65	2.9 x 1.5 x 1.0	2.9 x 1.3 x 1.0	2.0 x 1.25 x 0.95	1.0 x 0.6 x 0.48	1.0 x 0.6 x 0.37
P_{tot} (mW)													1700	600	250	200	250	250
V_{DS} (V)	V_{GS} (V)	I_D (A)	$V_{GS(th)}$ min (V)	$V_{GS(th)}$ max (V)	t_{on} typ (ns)	t_{off} typ (ns)	Q_G typ (nC)	ESD protection (kV)	R_{DSon} typ (mΩ) @ V_{GS} = 10 V	4.5 V	2.5 V	1.8 V						
20	8	4.7	0.45	1	8.2	39.5	6.2	2	-	24	29	40		**PMN28UNEA**	**PMV28UNEA**			
		1.9	0.4	1	8	31	2.2	2	-	63	77	114				**PMF63UNE**		
		2.2	0.4	1	6	21	2.6	2	-	64	78	110			**PMV65UNE**			
		1.9	0.45	0.95	5.3	16	1.6	2	-	120	155	195					**PMZ130UNE**	
		1.6	0.45	0.95	5.3	16	1.6	2	-	155	190	235						**PMZB150UNE**
		1	0.5	0.95	6	86	0.45	2	-	270	360	470					**PMZ290UNE2**	**PMZB290UNE2**
		0.6	0.45	0.95	5.6	19	0.4	1	-	470	620	845					PMZ600UNE	PMZB600UNE
	12	6.3	0.75	1.25	16	44	9.9	2	-	16	24	-			**PMV20XNEA**			
		8.6	0.47	0.9	7	135	7.7	-	-	15	18	22			PMV16XN			
		9.1	0.4	0.9	9	31	12	1	-	15	19	22		**PMN16XNE**				
		5.4	0.4	0.9	7	35	6.2	-	-	24	30	40			PMV30UN2			
		6	0.4	0.9	5.5	22	5.1	1	-	28	38	42		**PMN30UNE**				
30	8	1.5	0.45	0.95	5	17	1.6	2	-	210	240	270					**PMZ200UNE**	**PMZB200UNE**
		1	0.45	0.95	4	12	0.8	2	-	390	460	530					**PMZ390UNE**	**PMZB390UNE**
		0.59	0.45	0.95	4	12	0.6	2	-	550	660	770					**PMZ550UNE**	**PMZB550UNE**
		0.4	0.6	1.1	26	88	0.52	2	-	1000	1400	2000			NX3008NBK	NX3008NBKW		
	12	7.2	0.4	0.9	8	33	12.4	2	-	19	22	17			PMV20XNE			
		5.7	0.4	0.9	9	34	7	-	-	33	42	54		**PMN30UN**				
		4.4	0.4	0.9	9	34	7	-	-	36	43	56			PMV40UN2			
		0.9	0.5	1.5	8	11	0.74	2	-	234	324	-				**PMF250XNE**		
	20	7.6	1	2	9	9	7.2	-	17	21	-	-			PMV20EN			
		5.5	1	2.5	8	33	12.6	2	17	22	-	-		**PMN25ENEA**	**PMV25ENEA**			
		3.9	1	2.5	6.3	14.1	6	2	30	39	-	-			**PMV50ENEA**			
		3.1	1	2.5	18	78	6.5	-	28	37	-	-			PMV37EN2			
		4.5	1	2.5	3	11	6	1	30	44	-	-		**PMN40ENE**				
		5.1	1	2	3	11	3.6	-	35	43	-	-			PMV45EN2			
		2.1	1	2.5	3	15	2.6	2	70	90	-	-			**PMV90ENE**			
		0.18	0.8	1.5	10	51	0.34	-	2700	3000	4000	-			NX3020NAK	NX3020NAKW		
40	20	3,1	1	2,5	-	-	-	1	65	88	-	-			**PMV65ENEA**			
		2.5	1	2.5	14	14	2.4	1	95	120	-	-			PMV130ENEA			
55	10	0.3	0.4	1.3	4	11	1	3	-	2300	2400	3100			BSH111BK			
60	20	3.1	1.3	2.7	9	33	12.7	2	46	52		-		**PMN55ENEA**	**PMV55ENEA**			
		2.1	1.3	2.7	6.4	15.9	5.9	2	96	108	-	-		**PMN120ENEA**	**PMV120ENEA**			
		1.5	1.3	2.7	6.3	13	3.9	2	176	196	-	-		**PMN230ENEA**	**PMV230ENEA**			
		0.8	1.3	2.7	5.3	10.2	2.4	2	300	332	-	-			**PMV450ENEA**			
		0.19	0.8	1.5	6	11	0.33	yes	2800	3500	4500	-			**NX138AK**	**NX138AKW**		
		0.27	0.5	1.5	7.9	12.5	0.49	2	2100	2200	2600	-			**NX138BK**	**NX138BKW**		
		0.1	0.6	1.4	2	5		2	2800	3800	-	-			BSN20BK			
		0.19	1.1	2.1	12	34	0.33	yes	3000	3700	-	-			NX7002AK	NX7002AKW		
		0.27	1.1	2.1	4.7	6.9	1	2	2200	2500	-	-			NX7002BK	NX7002BKW	NX7002BKM	NX7002BKMB
100	20	1.5	1.3	2.7	4.8	9.3	4.5	1	285	300	-	-	**PMT280ENEA**					
		1.1	1.3	2.7	5.7	10.2	2.9	1	527	555	-	-	**PMT560ENEA**					

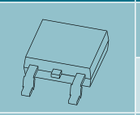
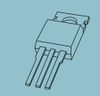
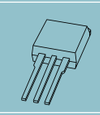
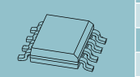
Power MOSFETs 30 V – Part 1

Package	Type number	V_{DS} [max] (V)	R_{DSon} [max] @ V_{GS} = 10 V (mΩ)	R_{DSon} [max] @ V_{GS} = 4.5 V (mΩ)	I_D [max] (A)	$Q_{G(tot)}$ [typ] (nC)
LFPAK56; Power-SO8 (SOT669)	PSMN0R9-30YLD	30	0.87	1.09	300	51
	PSMN1R0-30YLD	30	1.02	1.3	300	38.2
	PSMN1R0-30YLC	30	1.15	1.4	100	50
	PSMN1R2-30YLD	30	1.24	1.6	100	32
	PSMN1R2-30YLC	30	1.25	1.65	100	38
	PSMN1R3-30YL	30	1.3	1.95	100	46.6
	PSMN1R4-30YLD	30	1.42	1.85	100	27.6
	PSMN1R5-30YL	30	1.5	1.9	100	36.2
	PSMN1R5-30YLC	30	1.55	2.05	100	30
	PSMN1R7-30YL	30	1.7	2.1	100	36.2
	PSMN2R0-30YL	30	2	2.63	100	30
	PSMN2R0-30YLE	30	2	3.5	100	87
	PSMN2R2-30YLC	30	2.15	2.8	100	26
	PSMN2R4-30YLD	30	2.4	3.1	100	18
	PSMN2R5-30YL	30	2.4	3.16	100	27
	PSMN2R6-30YLC	30	2.8	3.65	100	18
	PSMN3R0-30YL	30	3	4.04	100	21
	PSMN3R0-30YLD	30	3.1	4	100	14.5
	PSMN3R2-30YLC	30	3.5	4.55	100	14.2
	PSMN3R5-30YL	30	3.5	4.61	100	19
	PSMN4R0-30YL	30	4	5.25	100	17.6
	PSMN4R0-30YLD	30	4	5.5	95	9.6
	PSMN4R1-30YLC	30	4.35	5.7	92	11
	PSMN4R5-30YLC	30	4.8	6.1	84	9.6
	PSMN5R0-30YL	30	5	6.7	91	14.1
	PSMN6R0-30YL	30	6	7.87	79	11
	PSMN6R0-30YLD	30	6	8.35	66	6.7
	PSMN6R1-30YLD	30	6	8.35	66	6.4
	PSMN6R0-30YLB	30	6.5	8.1	71	9
	PSMN7R0-30YL	30	7	9.1	76	10
	PSMN7R0-30YLC	30	7.1	8.9	61	7.9
	PSMN7R5-30YLD	30	7.5	10.2	51	5.8
	PSMN9R1-30YL	30	9.1	13.6	57	8.4
	PSMN9R5-30YLC	30	9.8	12.1	44	5
	PSMN011-30YLC	30	11.6	14.5	37	4.9
	PSMN013-30YLC	30	13.6	16.9	32	4
LFPAK33 (SOT1210)	PSMN2R4-30MLD	30	2.4	3.2	70	16
	PSMN2R9-30MLC	30	2.95	3.8	70	16.7
	PSMN3R0-30MLC	30	3.15	4.05	70	16.1
	PSMN4R2-30MLD	30	4.3	5.7	70	9.2
	PSMN4R4-30MLC	30	4.65	6	70	10.6
	PSMN7R0-30MLC	30	7	9	67	8.2
	PSMN7R5-30MLD	30	7.6	10.3	57	5.8
	PSMN9R8-30MLC	30	9.8	12.4	50	5
	PSMN013-30MLC	30	13.6	16.9	39	3.7
	PSMN020-30MLC	30	18.1	27	31.8	4.6
D²PAK (SOT404)	PSMNR90-30BL	30	1	1.4	120	118
	PSMN1R5-30BLE	30	1.5	1.85	120	228
	PSMN1R8-30BL	30	1.8	2.1	100	83
	PSMN1R6-30BL	30	1.9	2.2	100	101
	PSMN2R0-30BL	30	2.1	2.9	100	55
	PSMN2R7-30BL	30	3	3.7	100	32
	PSMN3R4-30BL	30	3.3	3.8	100	31
	PSMN3R4-30BLE	30	3.4	5	120	81
	PSMN4R3-30BL	30	4.1	5.2	100	19
	PSMN017-30BL	30	17	23.3	32	5.1
	PSMN022-30BL	30	22.6	29.6	30	4.4

For the most current product information go to www.nxp.com/mosfets (updated daily!)

Power MOSFETs 30 V – Part 2

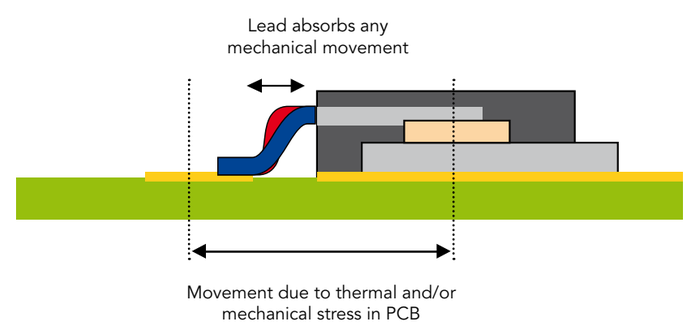
types in **bold** represent new products

Package	Type number	V_{DS} [max] (V)	R_{DSon} [max] @ V_{GS} = 10 V (mΩ)	R_{DSon} [max] @ V_{GS} = 4.5 V (mΩ)	I_D [max] (A)	$Q_{G(tot)}$ [typ] (nC)
DPAK (SOT428) 	PHD101NQ03LT	30	5.5		75	23
	PHD71NQ03LT	30	10		75	13.2
TO-220AB (SOT78) 	PSMN1R1-30PL	30	1.3	1.6	120	118
	PSMN1R6-30PL	30	1.7	2.1	100	101
	PSMN1R8-30PL	30	1.8	2.3	100	83
	PSMN2R0-30PL	30	2.1	2.8	100	55
	PSMN2R7-30PL	30	2.7	3.6	100	32
	PSMN3R4-30PL	30	3.4	4.1	100	31
	PSMN4R3-30PL	30	4.3	6.2	100	19
	PHP36N03LT	30	17	22	43.4	18.5
	PSMN017-30PL	30	17	23.4	32	5.1
	PSMN022-30PL	30	22	34	30	4.4
I²PAK (SOT226) 	PSMN1R1-30EL	30	1.3	1.6	120	118
	PSMN017-30EL	30	17	23.4	32	5.1
SO8 (SOT96-1) 	PHK31NQ03LT	30	4.4	5.6	30.4	33
	PSMN005-30K	30	5.5	8		34
	PHK18NQ03LT	30	8.9	12.5	20.3	10.6
	PHK13N03LT	30	20	26	13.8	10.7
	PHK12NQ03LT	30		14	11.8	

For the most current product information go to www.nxp.com/mosfets (updated daily!)

LFPAK for mechanical and thermal ruggedness

NXP LFPAK



LFPAK pins provide compliance while allowing for thermal expansion due to temperature differences between the MOSFET and the PCB, and allowing for mechanical strain due to PCB bending and flexing

Power MOSFETs 105 - 150 V

Package	Type number	V_{DS} [max] (V)	R_{DSon} [max] @ V_{GS} = 10 V (mΩ)	I_D [max] (A)	$Q_{G(tot)}$ [typ] (nC)
LFPAK56; Power-SO8 (SOT669)	PSMN059-150Y	150	59	43	27.9
D²PAK (SOT404)	PSMN030-150B	150	30	55.5	98
	PSMN035-150B	150	35	50	79
	PHB45NQ15T	150	42	45.1	32
DPAK (SOT428)	PSMN063-150D	150	63	29	55
TO-220AB (SOT78)	PHP45NQ11T	105	25	47	60
	PSMN015-110P	110	15	75	90
	PHP27NQ11T	110	50	27.6	30
	PHP23NQ11T	110	70	23	22
	PHP18NQ11T	110	90	18	21
	PSMN6R3-120PS	120	6.7	70	207.1
	PSMN7R8-120PS	120	7.9	70	167
	PSMN030-150P	150	30	55.5	98
	PSMN035-150P	150	35	50	79
	PHP30NQ15T	150	63	29	55
	PHP28NQ15T	150	65	28.5	24
I²PAK (SOT226)	PSMN6R3-120ES	120	6.7	70	207.1
	PSMN7R8-120ES	120	7.9	70	167
SO8 (SOT96-1)	PHK5NQ15T	150	75	5	29
	PSMN085-150K	150	85		40

For the most current product information go to www.nxp.com/mosfets (updated daily!)

P-channel

Package	Type number	V_{DS} [max] (V)	R_{DSon} [max] @ V_{GS} = 10 V (mΩ)	R_{DSon} [max] @ V_{GS} = 4.5 V (mΩ)	I_D [max] (A)	$Q_{G(tot)}$ [typ] (nC)
SO8 (SOT96-1)	PMK30EP	-30	19	30	-14.9	50
	PMK35EP	-30	19	35	-14.9	42
	PHP225	-30	250	400	-	10
	PMK50XP	-20	-	50	-7.9	10
	PHK04P02T	-16	-	120	-4.66	7.2

For the most current product information go to www.nxp.com/mosfets (updated daily!)

Multi-chip

Package	Type number	Channel type	V_{DS} [max] (V)	R_{DSon} [max] @ V_{GS} = 10 V (mΩ)	I_D [max] (A)	$Q_{G(tot)}$ [typ] (nC)
SO8 (SOT96-1)	PHP225	P	-30	250	-	10
	PHKD6N02LT	N	20	-	10.9	15.3
	PHKD13N03LT	N	30	20	10.4	10.7
	PHN203	N	30	30	6.3	14.6
	PHN210T	N	30	100	3.4	6
	PHC21025	N/P	30	250	-	10
	PHKD3NQ10T	N	100	90	3	21
	PHC2300	N/P	300	6000	-	6.24

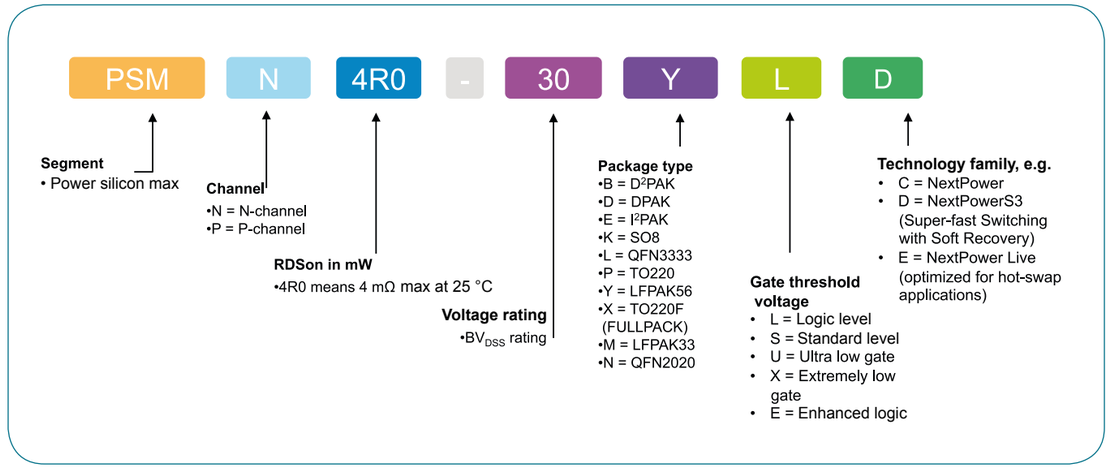
For the most current product information go to www.nxp.com/mosfets (updated daily!)

Power MOSFETs 200 V

Package	Type number	V_{DS} [max] (V)	R_{DSon} [max] @ V_{GS} = 10 V (mΩ)	I_D [max] (A)	$Q_{G(tot)}$ [typ] (nC)
LFPAK56; Power-SO8 (SOT669)	PSMN102-200Y	200	102	21.5	30.7
D²PAK (SOT404)	PSMN057-200B	200	57	39	96
	PSMN070-200B	200	70	35	77
	PHB33NQ20T	200	77	32.7	32.2
	PHB20NQ20T	200	130	20	65
DPAK (SOT428)	PSMN130-200D	200	130	20	65
	PHD9NQ20T	200	400	8.7	24
TO-220AB (SOT78)	PSMN057-200P	200	57	39	96
	PSMN070-200P	200	70	35	77
	PHP33NQ20T	200	77	32.7	32.2
	PHP20NQ20T	200	130	20	65
	PHP9NQ20T	200	400	8.7	24
SO8 (SOT96-1)	PSMN165-200K	200	165	-	40

For the most current product information go to www.nxp.com/mosfets (updated daily!)

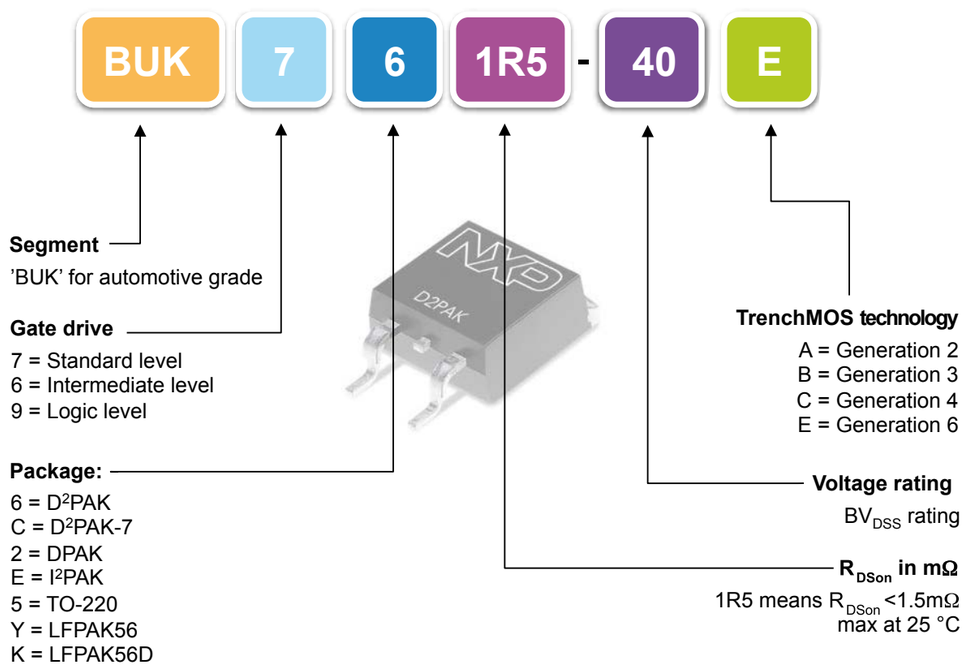
PSMN part numbering



4 steps to select an automotive MOSFET

1. Select a voltage, e.g. 40 V
2. Select a package, e.g D²PAK
3. Choose an R_{DSon} from our extensive range
4. Select a 'BUK' type and visit www.nxp.com/automotivemosfets to download datasheets and models, and order samples

Automotive-grade MOSFET product numbering



High-performance automotive MOSFETs

MOSFET package selection

Through-hold

TO220
- Industry standard
- 120 A

I²PAK
- Industry standard
- 120 A

Surface-mount

Premium performance

D²PAK-7
- Highest performance
- 190 A

D²PAK
- Industry standard
- 120 A

Space saving

LFPAK56
- PowerSO8
- 100 A

LFPAK56D
- Dual Power-SO8
- 40 A per channel

DPAK
- Industry standard
- Proven reliability
- 100 A

SOT223
- Industry standard
- Proven reliability

All packages are automotive AEC-Q101 qualified to 175 °C and RoHs compliant

Automotive MOSFETs

Automotive-compliant small-signal MOSFETs

types in **bold** represent new products

Package															SOT223	SOT457 (SC-74)	SOT23	SOT363 (SC-88)	SOT323 (SC-70)	SOT666	DFN-2020MD-6 (SOT1220)	DFN2020-6 (SOT1118)	DFN1010D-3 (SOT1215)	DFN1006-3 (SOT883)
Size (mm)															6.5 x 3.5 x 1.65	2.9 x 1.5 x 1.0	2.9 x 1.3 x 1.0	2.0 x 1.25 x 0.95	2.0 x 1.25 x 0.95	1.6 x 1.2 x 0.55	2.0 x 2.0 x 0.65	2.0 x 2.0 x 0.65	1.1 x 1.0 x 0.37	1.0 x 0.6 x 0.5
P_{tot} (mW)															1700	600	250	300	200	300	1250	1250	1000	250
Polarity	Configuration	V_{DS} (V)	V_{GS} (V)	I_D (A)	$V_{GS(th)}$ min (V)	$V_{GS(th)}$ max (V)	t_{on} typ (ns)	t_{off} typ (ns)	Q_G typ (nC)	ESD protection (kV)	R_{DSon} typ (mΩ) @ V_{GS} = 10 V	4.5 V	2.5 V	1.8 V										
N-channel	single	20	8	4.7	0.45	1	8.2	39.5	6.2	2	-	24	29	40		**PMN28UNEA**	**PMV28UNEA**							
			12	6.3	0.75	1.25	16	44	9.9	2	-	16	24	-			**PMV20XNEA**				**PMPB20XNEA**			
		30	8	0.4	0.6	1.1	26	88	0.52	2	-	1000	1400	2000			NX3008NBK		NX3008NBKW					
			12	3.1	0.75	1.25	9	19	2.9	2	-	55	72	-								**PMDPB56XNEA**		
			20	5.5	1	2.5	8	33	12.6	2	17	22	-	-		**PMN25ENEA**	**PMV25ENEA**							
				3.9	1	2.5	6.3	14.1	6	2	30	39	-	-			**PMV50ENEA**							
				3	1	2.5	6	11	3.6	2	54	70	-	-			**PMV100ENEA**							
		40	20	3.1	1	2.5	-	-	-	1	65	88	-	-			**PMV65ENEA**							
				2.5	1	2.5	14	14	2.4	1	95	120	-	-			PMV130ENEA							
		60	20	4	1.3	2.7	4.5	13.5	7,5	1	42	48	-	-							**PMPB55ENEA**			
				3.1	1.3	2.7	9	33	12.7	2	46	52	-	-		**PMN55ENEA**	**PMV55ENEA**							
				4	1.3	2.7	4	10.5	6.2	2.7	72	85	-	-							PMPB85ENEA			
				2.1	1.3	2.7	6.4	15.9	5.9	2	96	108	-	-		**PMN120ENEA**	**PMV120ENEA**							
				1.5	1.3	2.7	6.3	13	3.9	2	176	196	-	-		**PMN230ENEA**	**PMV230ENEA**							
				0.8	1.3	2.7	5.3	10.2	2.4	2	300	332	-	-			**PMV450ENEA**							
				0.36	0.9	1.5	5	13	0.72	-	900	1000	-	-			BSS138P		BSS138PW					
				0.36	0.48	1.6	10	58	0.6	1.5	1000	1100	1400	-			BSS138BK		BSS138BKW					
				0.3	1	2.5	11	19	0.5	2	1000	1300	-	-			2N7002BK		2N7002BKW					2N7002BKM
				0.3	1	2.5	16	60	1.09	3	1100	1300	-	-			2N7002CK							
				0.2	0.8	1.5	5	36	0.39	yes	2700	3000	4000	-			BSS138AKA							
		80	20	1.9	1.3	2.7	3.5	9.5	4.8	2	175	195	-	-							PMPB215ENEA			
				2.8	1.3	2.7	5	15	9.9	2.8	80	92	-	-							PMPB95ENEA			
				1.1	1.3	2.7	2	9	3	2	345	390	-	-									PMXB360ENEA	
		100	20	1.5	1.3	2.7	4.8	9.3	4.5	1	285	300	-	-	**PMT280ENEA**									
				1.1	1.3	2.7	5.7	10.2	2.9	1	527	555	-	-	**PMT560ENEA**									
	dual	20	8	0.8	0.5	0.95	10	117	0.45	2	-	380	620	1100						PMDT290UNE				
		30	8	0.4	0.6	1.1	26	88	0.52	2	-	1000	1400	2000				NX3008NBKS		NX3008NBKV				
		60	20	0.3	1	2.5	11	19	0.5	2	1000	1300	-	-				2N7002BKS						
				0.36	0.48	1.6	10	58	0.6	1.5	1000	1100	1400	-				BSS138BKS						
				0.36	0.9	1.5	5	13	0.72	-	900	1000	-	-				BSS138PS						
P-channel	single	20	8	6	0.45	0.95	8	50	15.6	4	-	37	45	59		PMN40UPEA								
				2	0.5	1.1	7	50	6	-	-	100	155	210			NX2301P							
			12	4.5	0.45	0.95	11	83	14.7	2	-	27	38	50			**PMV27UPEA**							
				5.7	0.75	1.25	15	37	15	2	-	27	39	-		PMN27XPEA								
				5.7	0.75	1.25	17	33	11.5	2	-	41	56	-		PMN42XPEA								
				4.5	0.75	1.25	7.9	59	11	2	-	28	42	-		**PMN30XPEA**	**PMV30XPEA**							
				3.5	0.75	1.25	11	61	8.5	-	-	48	71	-		**PMN48XPA**	**PMV48XPA**							
				4.1	0.75	1.25	15	51	8.7	-	-	48	72	-										
				2.8	0.75	1.25	7	36	5	2	-	67	99	-			**PMV65XPEA**							
				4.1	0.75	1.25	7	40	5.2	2	-	70	101	-		PMN70XPEA								
				2.3	0.7	1.3	5.3	36	3.4	2	-	100	155	-			**PMV100XPEA**							
		30	8	0.23	0.6	1.1	49	103	0.55	2	-	2800	5300	-			NX3008PBK		NX3008PBKW					
			20	4.2	1	3	6.1	3.7	12.8	2	35	47	-	-		**PMN50EPEA**	**PMV50EPEA**							
		40	20	1.5	1	2.5	4	26	4.7	1	180	220	-	-			PMV250EPEA							
		50	20	0.2	1.1	2.1	24	73	0.26	1	5300	6000	-	-			BSS84AK		BSS84AKW					BSS84AKM
		60	20	2.2	1	3	-	-	-	2	99	110	-	-		**PMN100EPEA**	**PMV100EPEA**							
				0.9	1	3	-	-	-	2	217	241	-	-		**PMN240EPEA**	**PMV240EPEA**							
		70	20	2.3	1	3	-	-	-	2	156	177	-	-	**PMT200EPEA**									
	dual	20	8	0.55	0.5	1.3	48	152	0.76	2	-	670	1200	1800						PMDT670UPE				
		30	8	0.2	0.6	1.1	49	103	0.55	2	-	2800	5300	-				NX3008PBKS		NX3008PBKV				
		50	20	0.16	1.1	2.1	24	73	0.26	1	5300	6000	-	-				BSS84AKS		BSS84AKV				
N	Compl	20	8	0.73	0.5	0.95	10	117	0.45	2	-	290	420	600				PMGD290UCEA						
P		20	8	0.5	0.5	1.3	48	152	0.76	2	-	670	1200	1800										

55 - 60 V N-channel automotive TrenchMOS – Part 2

Package name	Type number	V_{DS} [max] [V]	R_{DSon} [max] @ 10 V [mΩ]	R_{DSon} [max] @ 5 V [mΩ]	I_D [max] @ 25 °C [A]	$R_{th(j-mb)}$ [max] [K/W]
D²PAK (SOT404)	BUK7608-55A	55	8		75	0.59
	BUK9612-55B	55	10	12	75	0.95
	BUK7610-55AL	55	10		75	0.5
	BUK7611-55A	55	11		75	0.9
	BUK7611-55B	55	11		75	0.95
	BUK9614-55A	55	13	14	73	1
	BUK9616-55A	55	15	16	66	
	BUK9620-55A	55	18	20	54	1.2
	BUK7620-55A	55	20		54	1.2
	BUK9624-55A	55	21.7	24	46	1.4
	BUK7624-55A	55	24		47	
	BUK9628-55A	55	25	28	42	1.5
	BUK7628-55A	55	28		42	
	BUK9635-55A	55	32	35	34	1.8
	BUK7635-55A	55	35		35	1.7
	BUK9675-55A	55	68	75	20	2.4
	BUK7675-55A	55	75		20.3	2.4
	BUK962R5-60E	60	2.3	2.5	120	0.43
	BUK762R4-60E	60	2.4		120	0.43
	BUK962R8-60E	60	2.5	2.8	120	0.46
	BUK762R6-60E	60	2.6		120	0.46
	BUK963R3-60E	60	3	3.3	120	0.51
	BUK763R1-60E	60	3.1		120	0.51
	BUK964R2-60E	60	3.9	4.2	100	0.57
	BUK763R9-60E	60	3.9		100	0.57
	BUK964R8-60E	60	4.4	4.8	100	0.64
	BUK764R4-60E	60	4.5		100	0.64
	BUK966R5-60E	60	5.9	6.5	75	0.82
	BUK766R0-60E	60	6		75	0.82
	BUK969R0-60E	60	8	9	75	1.09
	BUK768R3-60E	60	8.3		75	1.09
	BUK9614-60E	60	12.8	14	56	1.56
	BUK7613-60E	60	13		58	1.56
D²PAK-7 (SOT427)	BUK9C10-55BIT	55	9	10	75	0.78
DPAK (SOT428)	BUK9212-55B	55	10	12	75	0.95
	BUK7210-55B	55	10		75	0.95
	BUK7212-55B	55	12		75	0.95
	BUK9215-55A	55	13.6	15	62	1.3
	BUK7215-55A	55	15		62	1.3
	BUK9219-55A	55	17.6	19	55	1.3

For the most current product information go to www.nxp.com/mosfets (updated daily!)

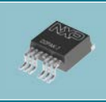
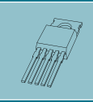
55 - 60 V N-channel automotive TrenchMOS – Part 3

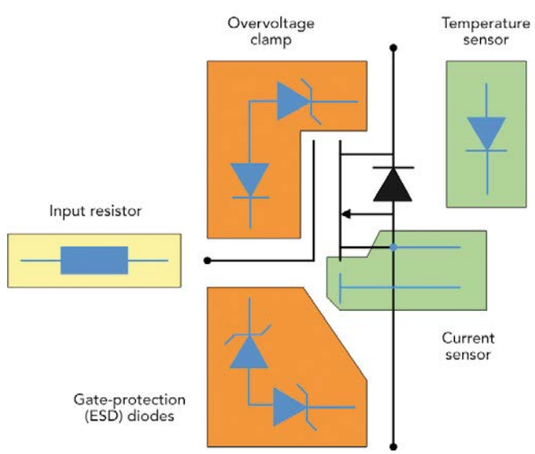
Package name	Type number	V_{DS} [max] [V]	R_{DSon} [max] @ 10 V [mΩ]	R_{DSon} [max] @ 5 V [mΩ]	I_D [max] @ 25 °C [A]	$R_{th(j-mb)}$ [max] [K/W]
DPAK (SOT428)	BUK7219-55A	55	19		55	1.3
	BUK9222-55A	55	20	22	48	1.5
	BUK9225-55A	55	22	25	43	1.6
	BUK7222-55A	55	22		48	1.5
	BUK7230-55A	55	30		38	1.7
	BUK9237-55A	55	33	37	32	1.94
	BUK7237-55A	55	37		32.3	1.9
	BUK9245-55A	55	40	45	28	2.1
	BUK9277-55A	55	69	77	18	2.93
	BUK7277-55A	55	77		18	2.9
	BUK92150-55A	55	125	140	11	4.1
	BUK72150-55A	55	150		11	4.1
TO-220AB (SOT78A)	BUK954R2-55B	55	3.7	4.2	75	0.5
	BUK754R0-55B	55	4		75	0.5
	BUK7506-55A	55	6.3		75	0.5
	BUK9508-55B	55	7	8.4	75	0.74
	BUK7507-55B	55	7.1		75	0.74
	BUK7508-55A	55	8		75	0.59
	BUK7509-55A	55	9		75	0.71
	BUK9511-55A	55	10	11	75	0.9
	BUK9512-55B	55	10	12	75	0.95
	BUK7511-55B	55	11		75	0.95
	BUK9514-55A	55	13	14	73	1
	BUK9518-55A	55	16	18	61	1.1
	BUK7516-55A	55	16		65.7	1.1
	BUK7520-55A	55	20		54	1.2
	BUK7528-55A	55	28		42	1.5
	BUK9535-55A	55	32	35	34	1.8
	BUK7535-55A	55	35		35	1.7
	BUK9575-55A	55	68	75	20	2.4
	BUK7575-55A	55	75		20.3	2.4
	BUK953R5-60E	60	3.4	3.7	120	0.51
	BUK954R8-60E	60	4.5	4.9	100	0.64
I²PAK (SOT226)	BUK9E06-55B	55	5.4	6	75	0.58
	BUK9E06-55A	55	5.8	6.3	75	0.5
	BUK9E08-55B	55	7	8.4	75	0.74
	BUK7E2R6-60E	60	2.6		120	0.43
	BUK7E3R5-60E	60	3.5		120	0.51
	BUK7E4R6-60E	60	4.6		100	0.64
	BUK7E13-60E	60	13		58	1.56

For the most current product information go to www.nxp.com/mosfets (updated daily!)

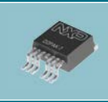
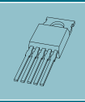
TrenchPLUS MOSFETs

TrenchPLUS is a range of standard MOSFETs with additional protection features, such as current and temperature sensing components, overvoltage clamps, and gate-protection (ESD) diodes. The system microcontroller can use data gathered from these sensors to implement cost-effective protection features, thus eliminating the need to design with protected power devices. All the standard products listed below offer one or more "PLUS" features. Custom versions can be developed for high-volume applications.

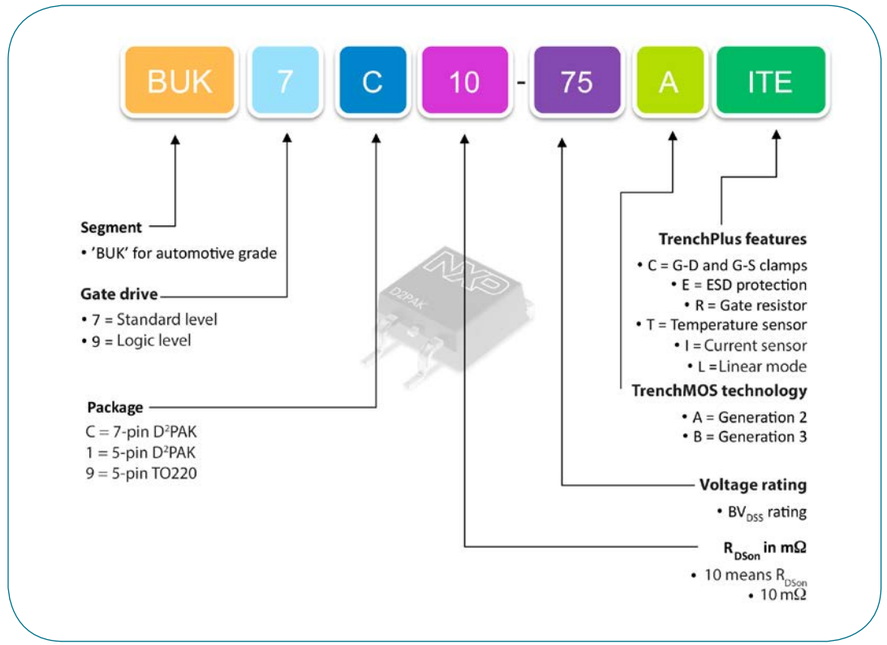
V_{DS} (V)	R_{DSon} (max) @ 10 V (mΩ)	R_{DSon} (max) @ 5 V (mΩ)	I_D (max) @ 25 °C (A)	Temperature sensing	Current sensing	Gate source clamps	Gate drain clamps	Gate resistor	Surface-mount package		Leaded package	
									7-pin D²PAK (SOT427)	5-pin D²PAK (SOT426)	TO220AB (SOT78C)	5-pin TO220 (SOT263B-01)
												
									10.0 x 15 x 4.5	10.0 x 15.0 x 4.5	15.0 x 10.0 x 4.5	10.0 x 19.0 x 4.5
34	6		75			•	•	•			BUK7L06-34ARC	
34	11		75			•	•	•			BUK7L11-34ARC	
40	4.1		75	•						BUK714R1-40BT		
40	5		75		•	•				BUK7105-40AIE		BUK7905-40AIE
40	5		75	•		•				BUK7105-40ATE		BUK7905-40ATE
40	5		75									BUK7905-40AI
40	6		75	•	•	•			BUK7C06-40AITE			



TrenchPLUS MOSFETs

V_{DS} (V)	R_{DSon} (max) @ 10 V (mΩ)	R_{DSon} (max) @ 5 V (mΩ)	I_D (max) @ 25 °C (A)	Temperature sensing	Current sensing	Gate source clamps	Gate drain clamps	Gate resistor	Surface-mount package		Leaded package	
									7-pin D²PAK (SOT427)	5-pin D²PAK (SOT426)	TO220AB (SOT78C)	5-pin TO220 (SOT263B-01)
												
									10.0 x 15 x 4.5	10.0 x 15.0 x 4.5	15.0 x 10.0 x 4.5	10.0 x 19.0 x 4.5
40	6.6	7	75	•		•	•			BUK9107-40ATC		BUK9907-40ATC
40	8		75	•		•	•			BUK7107-40ATC		BUK7907-40ATC
40	8		75		•	•				BUK7108-40AIE		BUK7908-40AIE
55	6.6	7	75	•		•				BUK9107-55ATE		
55	7		75		•	•				BUK7107-55AIE		BUK7907-55AIE
55	7		75	•		•				BUK7107-55ATE		BUK7907-55ATE
55	8		75	•	•	•			BUK7C08-55AITE			
55	9	10	75	•	•				BUK9C10-55BIT			
75	9		75		•	•				BUK7109-75AIE		BUK7909-75AIE
75	9		75	•		•				BUK7109-75ATE		BUK7909-75ATE
75	10		75	•	•	•			BUK7C10-75AITE			

Automotive TrenchPLUS part numbering



Product orientation (tape and reel pack)

2 pin packages

Orientation in tape	Package	Packing 12NC ending
	DFN1006-2 (SOD882)	315
	DFN1006D-2 (SOD882D)	315
	DFN1608D-2 (SOD1608)	315
	DSN0603-2 (SOD962)	315
	DSN0402-2 (SOD992)	315
	DSN1006-2 (SOD993)	315
	DSN1006U-2 (SOD995)	315
	DSN1608-2 (SOD963, SOD964)	315
	SOD80	115, 135
	SOD123F	115
	CFP3 (SOD123W)	115
	CFP5 (SOD128)	115
	SOD323	115, 135
	SOD323F	115
	SOD523	115, 135, 315, 335

3 pin packages

Orientation in tape	Package	Packing 12NC ending
	SOT89	146

Orientation in tape	Package	Packing 12NC ending
	DFN1010D-3 (SOT1215)	147
	DFN2020-3 (SOT1061)	115, 135
	DFN2020D-3 (SOT1061D)	115, 135
	SOT89	115, 135
	SOT663	115
	CFP15 (SOT1289)	139, 146
	DPAK (SOT428)	118
	D2PAK (SOT404)	118

Orientation in tape	Package	Packing 12NC ending
	DFN1006-3 (SOT883)	315
	DFN1006B-3 (SOT883B)	315
	SOT23	185, 215, 235
	SOT323	115, 135

Orientation in tape	Package	Packing 12NC ending
	SOT89	147

4 pin packages

Orientation in tape	Package	Packing 12NC ending
	LFPAK56 (SOT669)	115
	WLCSP4	084

Orientation in tape	Package	Packing 12NC ending

Orientation in tape	Package	Packing 12NC ending
	SOT143B	215, 235
	SOT223	115, 135

Orientation in tape	Package	Packing 12NC ending

5 pin packages

Orientation in tape	Package	Packing 12NC ending
	WLCSP5	087

Orientation in tape	Package	Packing 12NC ending
	SOT353	115, 135
	SOT665	115

Orientation in tape	Package	Packing 12NC ending

Orientation in tape	Package	Packing 12NC ending

> 6 pin packages

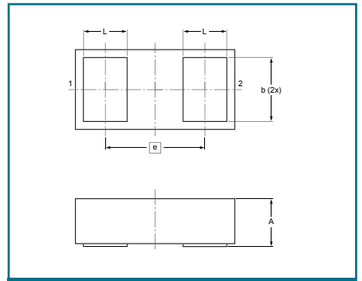
Orientation in tape	Package	Packing 12NC ending
	DFN1410-6 (SOT886)	115
	DFN1616-6 (SOT1189)	115
	DFN2020MD-6 (SOT1220)	184
	LFPAK33 (SOT1210)	115
	LFPAK56D (SOT1205)	115
	WLCSP6	023

Orientation in tape	Package	Packing 12NC ending
	DFN2020-6 (SOT1118)	115
	DFN2020D-6 (SOT1118D)	115
	DFN2020MD-6 (SOT1220)	115
	DFN1010B-6 (SOT1216)	147
	SOT363	115, 135
	SOT457	115, 135
	SOT666	115, 315

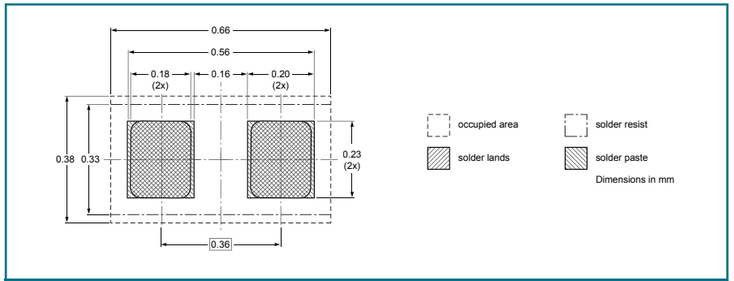
Orientation in tape	Package	Packing 12NC ending
	DFN1010-6 (SOT891)	132
	DFN1410-6 (SOT886)	132
	DFN2020MD-6 (SOT1220)	125
	SOT363	125, 165
	SOT457	125, 165

Orientation in tape	Package	Packing 12NC ending

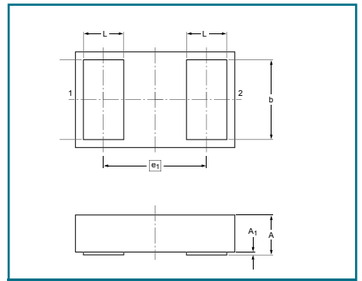
2-pin SMD packages



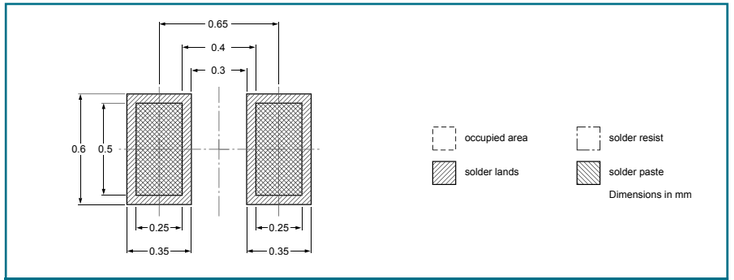
DSN0402-2 (SOD992)



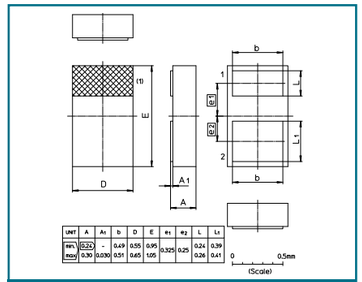
DSN0402-2 (SOD992)



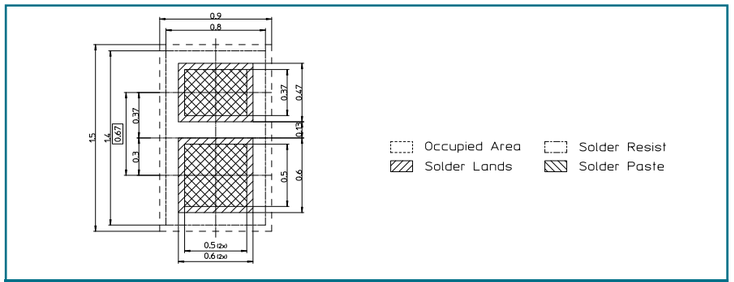
DSN1006-2 (SOD993)



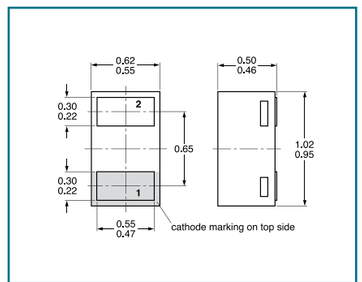
DSN1006-2 (SOD993)



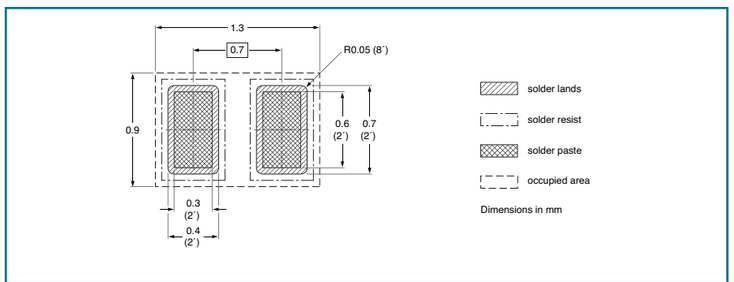
DSN1006U-2 (SOD995)



DSN1006U-2 (SOD995)



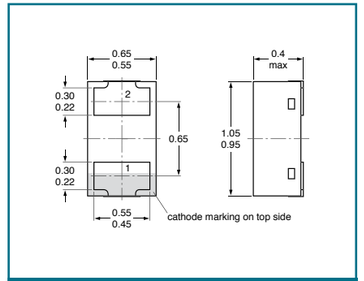
DFN1006-2 (SOD882)



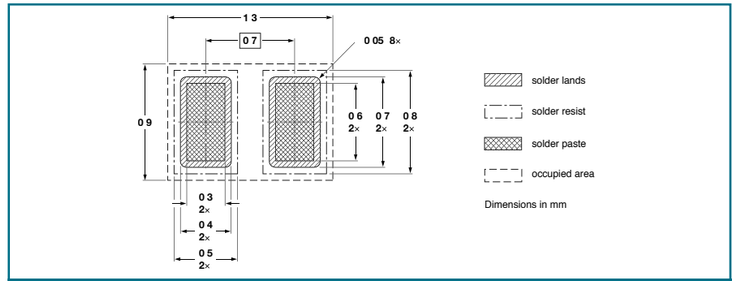
DFN1006-2 (SOD882)

Dimensions in mm

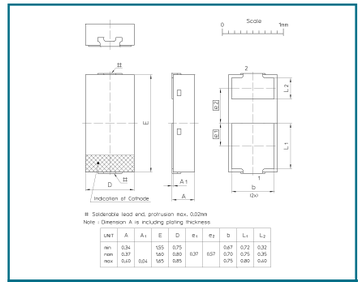
2-pin SMD packages



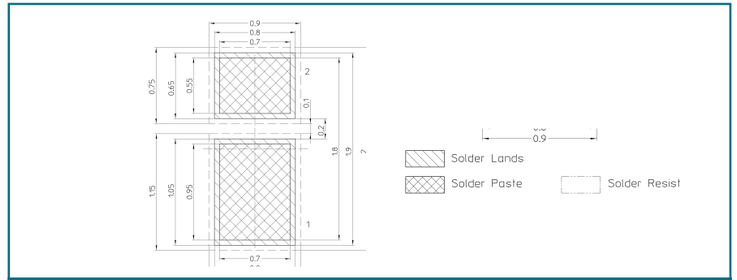
DFN1006D-2 (SOD882D)



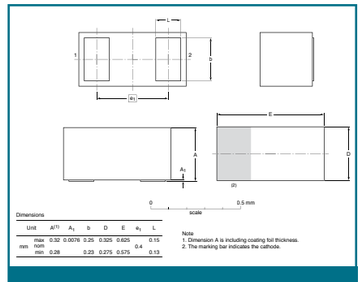
DFN1006D-2 (SOD882D)



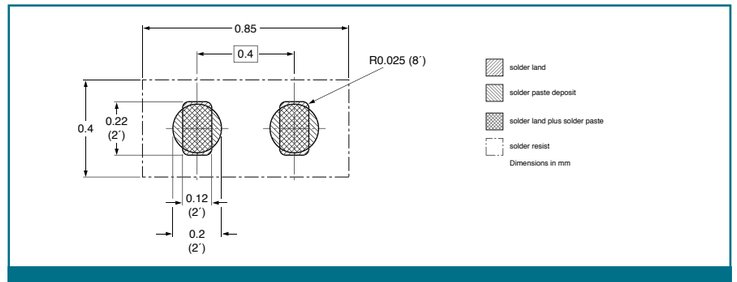
DFN1608D-2 (SOD1608)



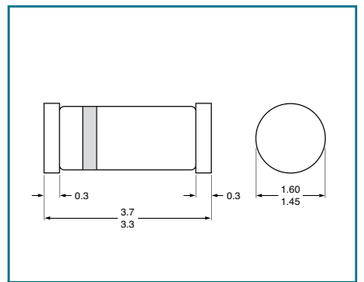
DFN1608D-2 (SOD1608)



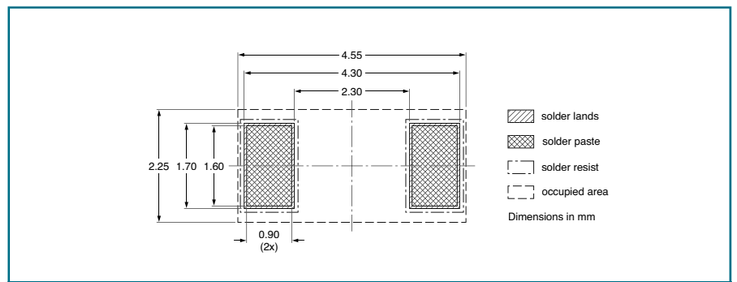
DSN0603-2 (SOD962)



DSN0603-2 (SOD962) and DSN0603B-2 (SOD962B)



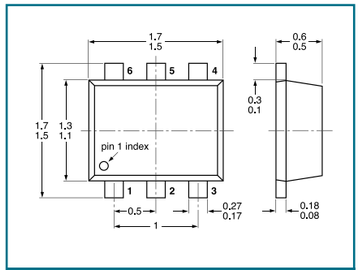
SOD80C



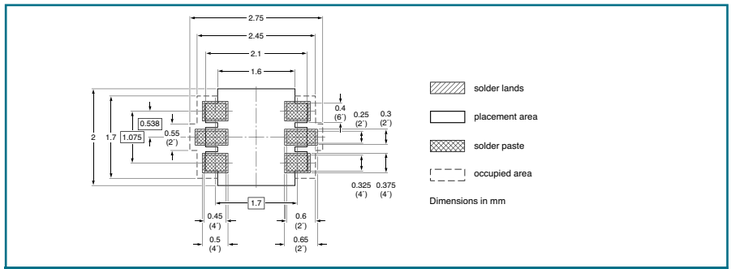
SOD80C

Dimensions in mm

6-pin SMD packages

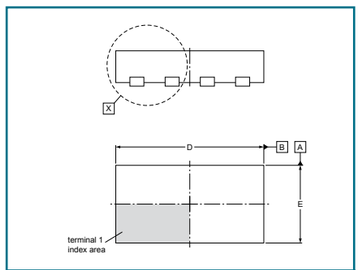


SOT666

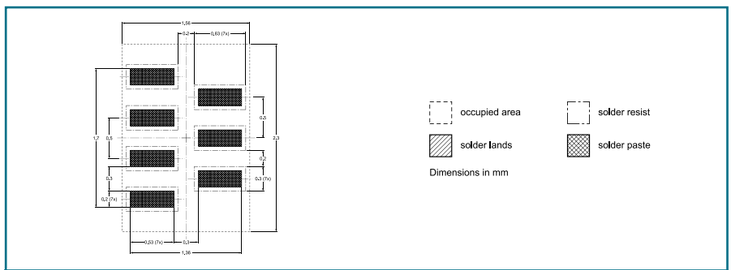


SOT666

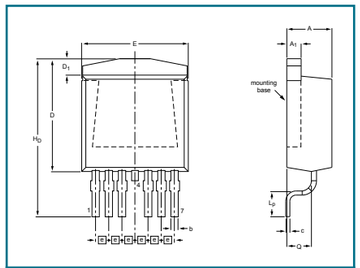
7-pin SMD packages



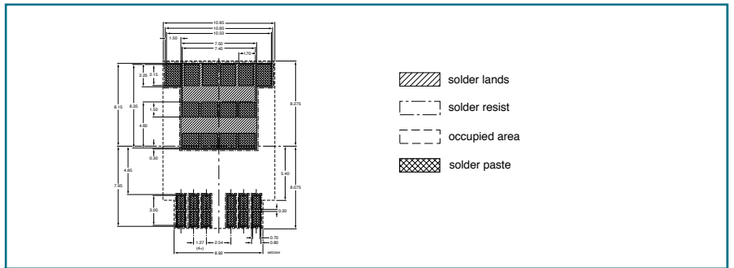
DFN2111-7 (SOT1358)



DFN2111-7 (SOT1358)

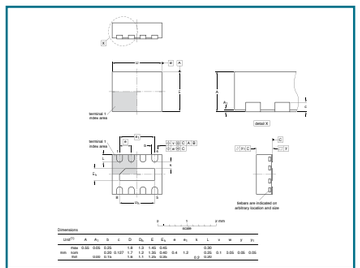


D2PAK-7 (SOT428)

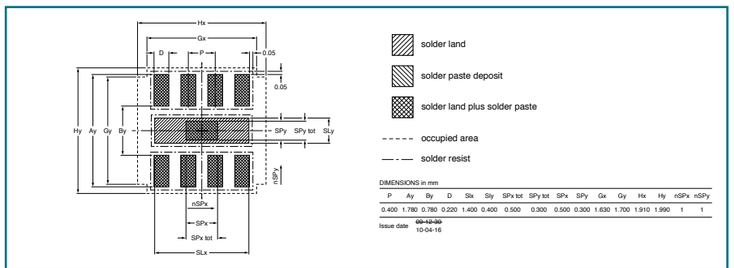


D2PAK-7 (SOT428)

8-pin SMD packages



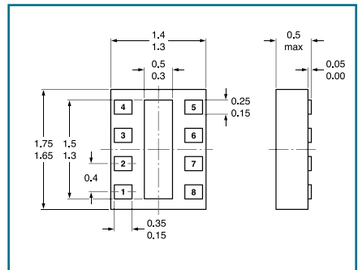
DFN1714-8 (SOT1166)



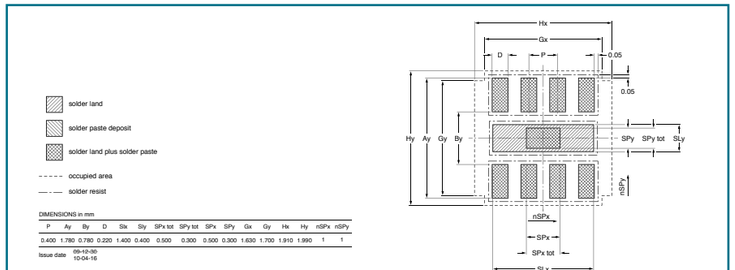
DFN1714-8 (SOT1166)

Dimensions in mm

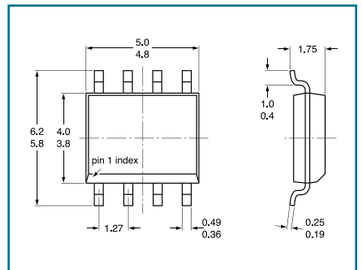
8-pin SMD packages



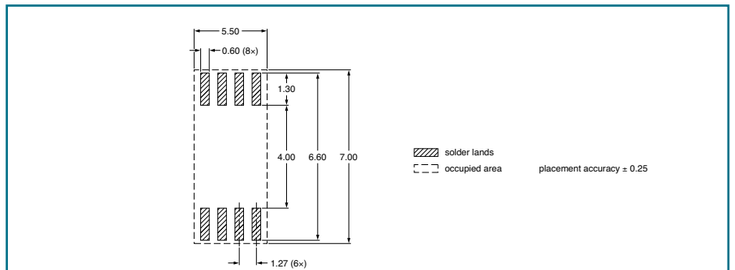
DFN1714U-8 (SOT983)



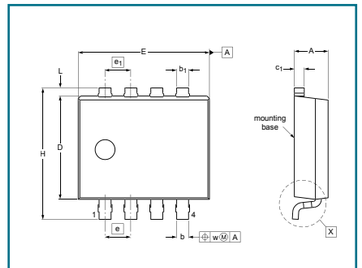
DFN1714U-8 (SOT983)



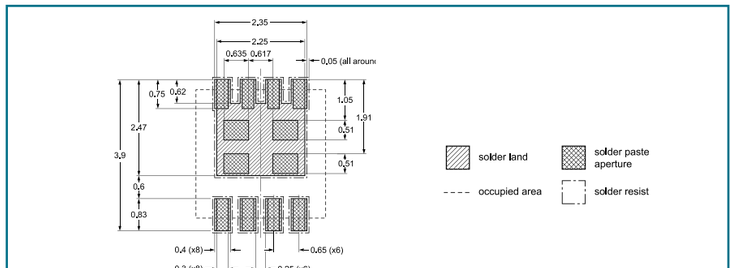
SOT96 (SO8)



SOT96 (SO8)



LFPAK33 (SOT1210)



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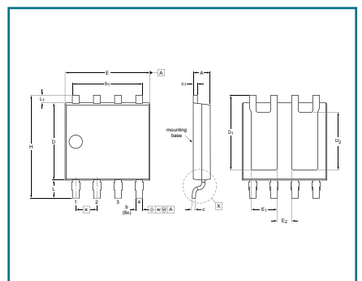
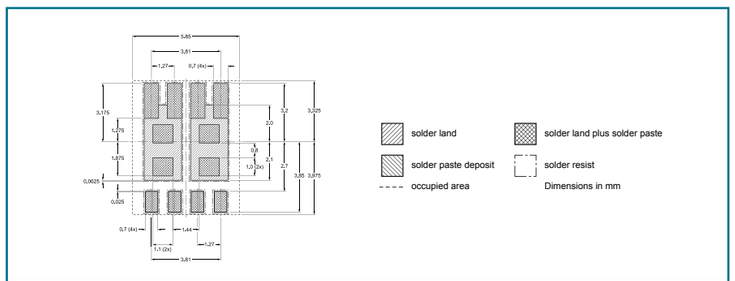


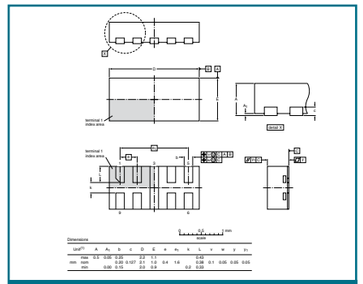
LFPAK56D (SOT1205)



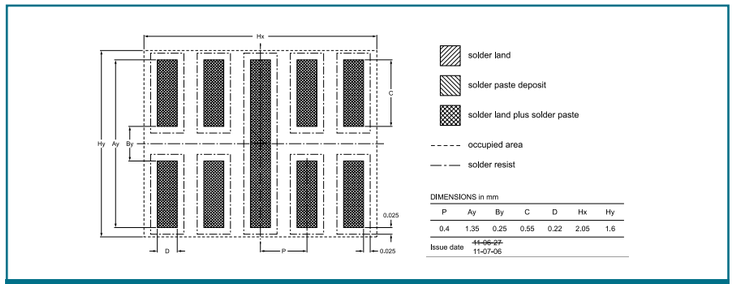
LFPAK56D (SOT1205)

Dimensions in mm

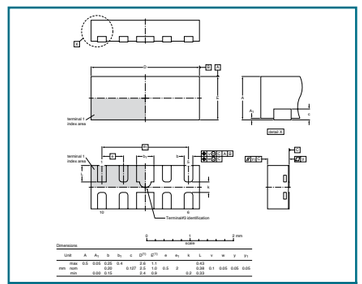
More than 8-pin SMD packages



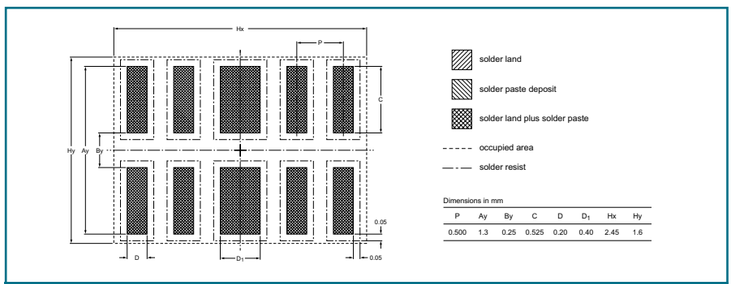
DFN2110-9 (SOT1178)



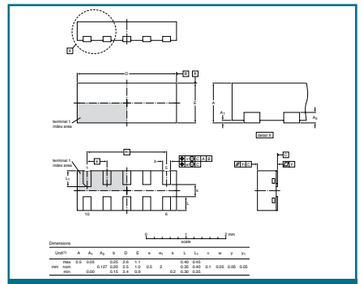
DFN2110-9 (SOT1178)



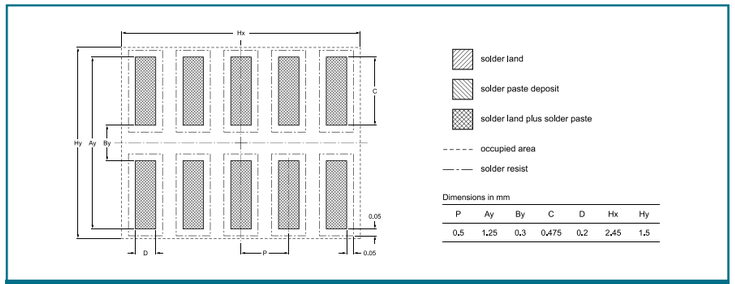
DFN2510-10 (SOT1165)



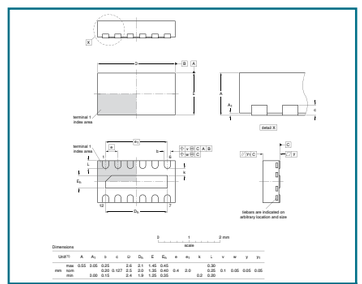
DFN2510-10 (SOT1165)



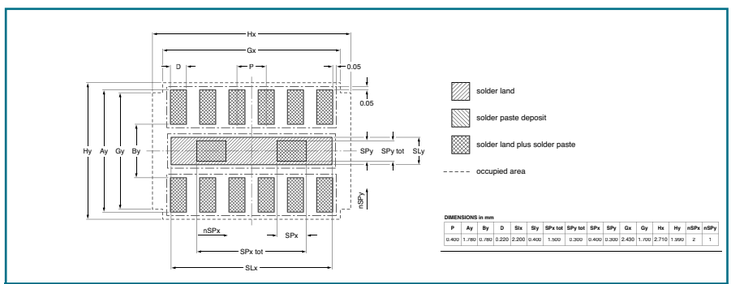
DFN2510A-10 (SOT1176)



DFN2510A-10 (SOT1176)



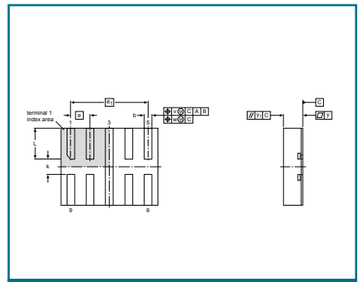
DFN2514-12 (SOT1167)



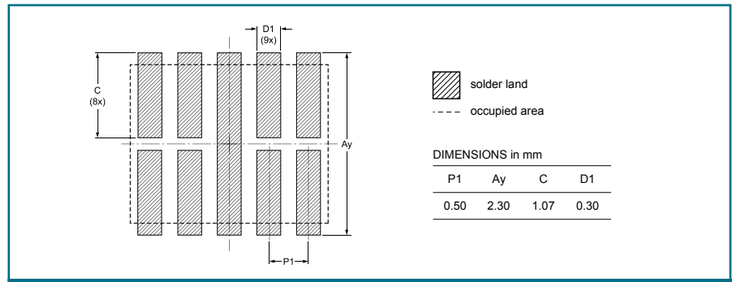
DFN2514-12 (SOT1167)

Dimensions in mm

More than 8-pin SMD packages



DFN2520-9 (SOT1333)



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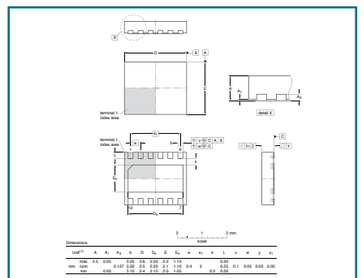

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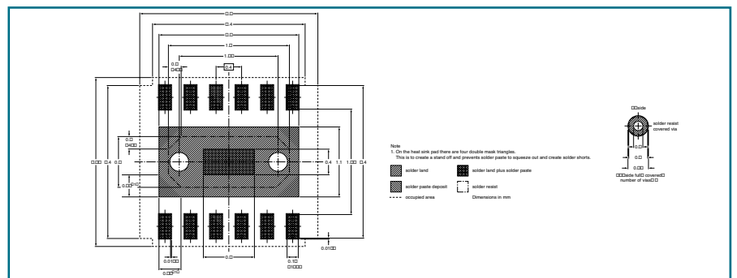

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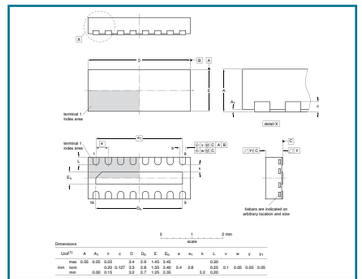
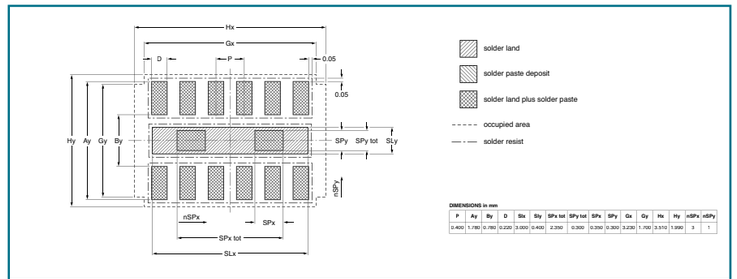
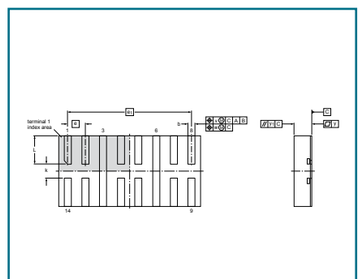


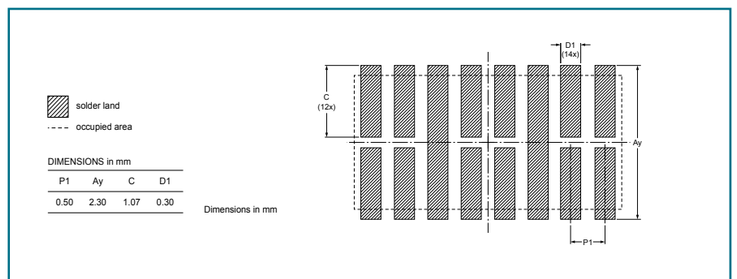
DFN3314-16 (SOT1168)



DFN3314-16 (SOT1168)



DFN4020-14 (SOT1334)



DFN4020-14 (SOT1334)

Dimensions in mm

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BAS21PG	43
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BAS21VD	43
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