



Small & Powerful

NXP MOSFETs and bipolar transistors in DFN1010

First 3 A transistors in a 1.1 mm² leadless plastic package

This new product series, housed in tiny leadless packages and ideal for use in tight-footprint power management and load switches, includes small yet powerful high-P_{tot} MOSFETs as well as bipolar transistors with benchmark values for R_{DSon} and V_{CEsat}.

KEY FEATURES

Single and dual MOSFETs (N-ch/P-ch)

- ▶ Low R_{DSon} down to 34 mΩ
- ▶ I_D up to 3.2 A
- ▶ Low voltage drive (V_{GS(th)}) = 0.65 V typ.)
- ▶ Voltage range of 12 to 80 V
- ▶ ESD protection of more than 1 kV

Single bipolar transistors

- ▶ Low V_{CEsat} values down to 70 mV
- ▶ Collector current (I_C) up to 2 A
- ▶ Peak collector current (ICM) up to 3 A
- ▶ V_{CEO} of 30 and 60 V
- ▶ AEC-Q101 qualified

Dual NPN/PNP resistor-equipped (digital) transistor

- ▶ 100 mA, R₁=R₂=47 kΩ
- ▶ AEC-Q101 qualified

KEY APPLICATIONS

- ▶ Portable, mobile, and automotive applications that require small-footprint solutions
- ▶ Power management
- ▶ Charging circuits
- ▶ Power switches (motors, fans, etc.)
- ▶ Level shifting
- ▶ LED lighting (automotive matrix light, etc.)

DFN1010 package

- ▶ Ultra-small and flat package (1.1 x 1 x 0.37 mm)
- ▶ Single and dual configurations (smallest package for dual transistors)
- ▶ Power dissipation (P_{tot}) of 1 W (DFN1010D-3)
- ▶ Single package with tin-plated, solderable side pads for improved mounting and automotive conformity

Single and dual general-purpose transistors



Selection guide: Single and dual MOSFETs

Package									DFN1010D-3 (SOT1215)	DFN1010B-6 (SOT1216)
Size (mm)									1.1 x 1.0 x 0.37	1.1 x 1.0 x 0.37
P _{tot} (mW)									1000	350
Configuration	Polarity	V _{DS} (V)	V _{GS} (V)	I _D (A)	V _{gs(th) min} (V)	V _{gs(th) max} (V)	ESD protection (kV)	R _{DSon typ /max} (mΩ)		
								@ 4.5 V	@ 2.5 V	@ 1.5 V
Single	N	20	8	3.2	0.5	0.9	1	42 / 54	48 / 68	64 / 120
Single	N	30	20	3.2	1	2	-	56 / 65	-	-
Single	N	12	8	1.1	0.4	0.9	1	34 / 45	39 / 64	50 / 100
Single	N	30	20	3.2	1	2.5	1	56 / 79	-	-
Single	N	80	20	1.1	1.3	2.7	2	390 / 540	-	-
Single	P	20	8		0.45	0.95	1	90	-	-
Single	P	20	8	1.2	0.45	0.95	1.5	350 / 447	450 / 645	760 / 2000
Single	P	30	20	2.4	1	2.5	1	125 / 170	-	-
Single	P	12	8	2.4	0.45	0.95	1.5	80	-	-
Dual	N	20	8	0.6	0.45	0.95	1	470 / 620	620 / 850	1125 / 3000
Dual	P	20	8	0.5	0.45	0.95	1	1020 / 1400	1270 / 2200	2300 / 5000
Compl.	N	20	8	0.6	0.45	0.95	1	470 / 620	620 / 850	1125 / 3000
	P	20	8	0.5	0.45	0.95	1	1020 / 1400	1270 / 2200	2300 / 5000

Selection guide: Low-saturation bipolar transistors

Package										DFN1010D-3 (SOT1215)
Size										1.1 x 1.0 x 0.37
P _{tot} (mW)										1000
V _{CEO} (V)	I _C (A)	I _{CM} (A)	h _{FE} min/typ	(at)I _C (A)	(at)V _{CE} (V)	R _{CESat typ.} (at) IC/IB=10	V _{CESat typ.} IC=0.5A IB=50mA	V _{CESat max} (mV)	(at)I _C (A)	(at)I _B (A)
30	1	1.5	230/380	0.5	2	175	90	235	1	0.1
			180/295	0.5	2	160	85	240	1	0.1
30	2	3	230/380	0.5	2	135	75	350	2	0.2
			180/295	0.5	2	125	70	330	2	0.2
60	1	1.5	150/240	0.5	2	170	90	235	1	0.1
			120/185	0.5	2	225	125	330	1	0.1
	1.7	2.5	120/185	0.5	2	205	105	500	1.7	0.17
	2	3	150/240	0.5	2	125	75	350	2	0.2

Selection guide: General-purpose transistors

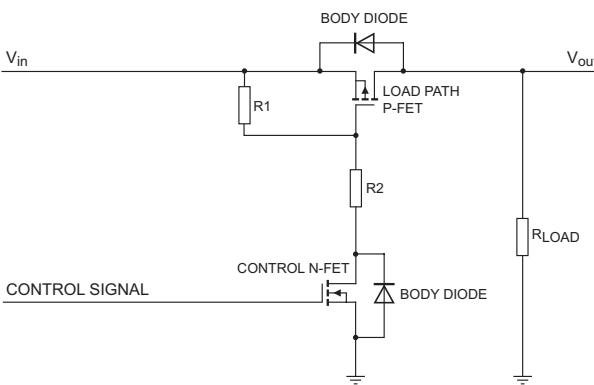
Package					DFN1010B-6 (SOT1216)
Size					1.0 x 1.0 x 0.37
P _{tot} (mW)					350
V _{CEO} (V)	I _C (mA)	h _{FE} min		h _{FE} max	f _T min (MHz)
45	100	200		450	100
					BC847QAPN
					BC847QAS *
					BC857QAS *

Selection guide: Resistor-equipped transistor

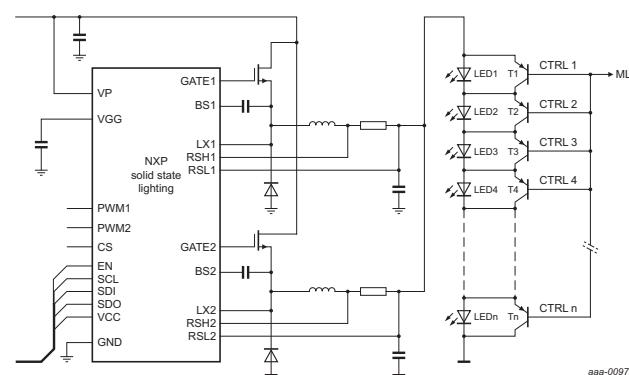
Package					DFN1010B-6 (SOT1216)
Size					1.0 x 1.0 x 0.37
P _{tot} (mW)					350
V _{CEO} (V)	I _C (mA)	Configuration	R1(kOhm) / R2 (kOhm)	Configuration	
50	100	R1=R2	47	NPN / PNP	PQMD12

* in development

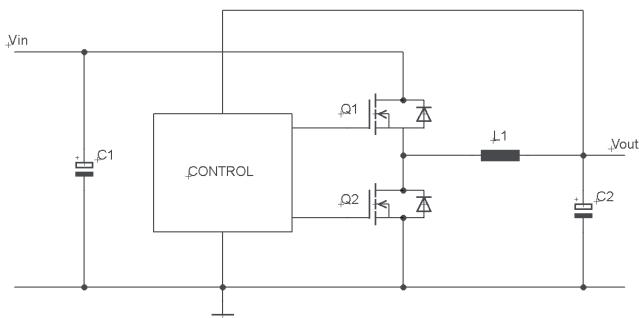
Load switch with P-ch. MOSFET



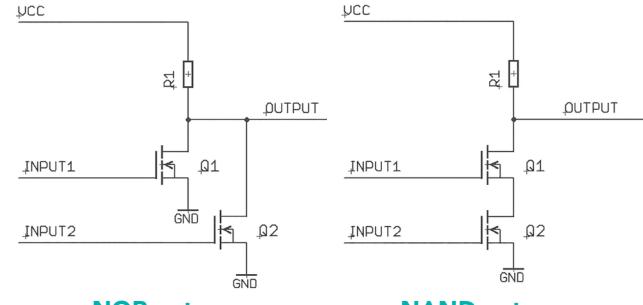
LED matrix light



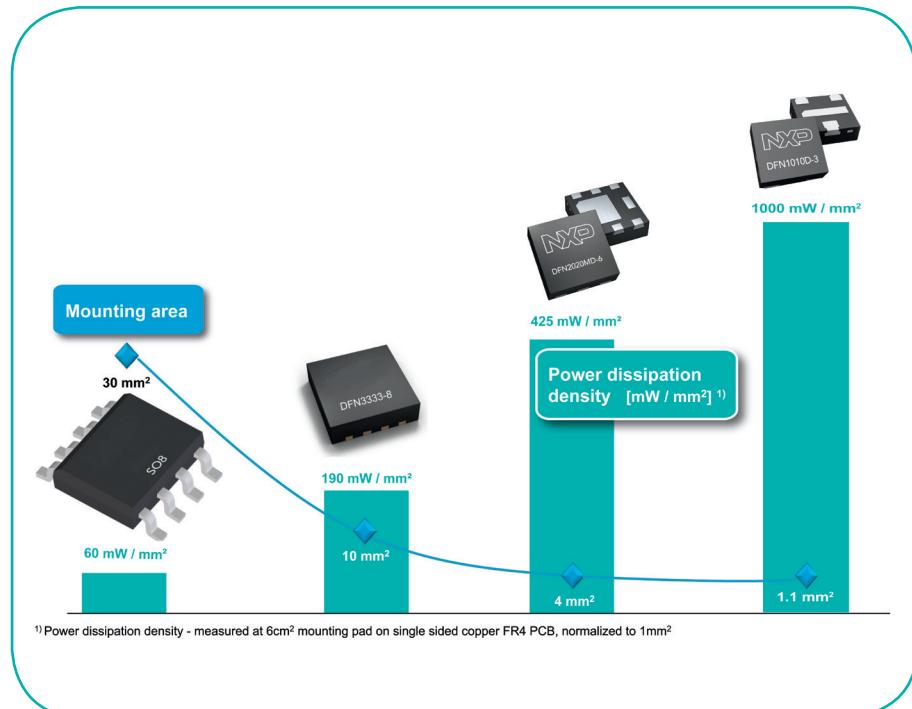
DC/DC converter (e.g. PMXB56EN)



Logic gates with dual N-ch. MOSFET (e.g. PMDXB600UNE)



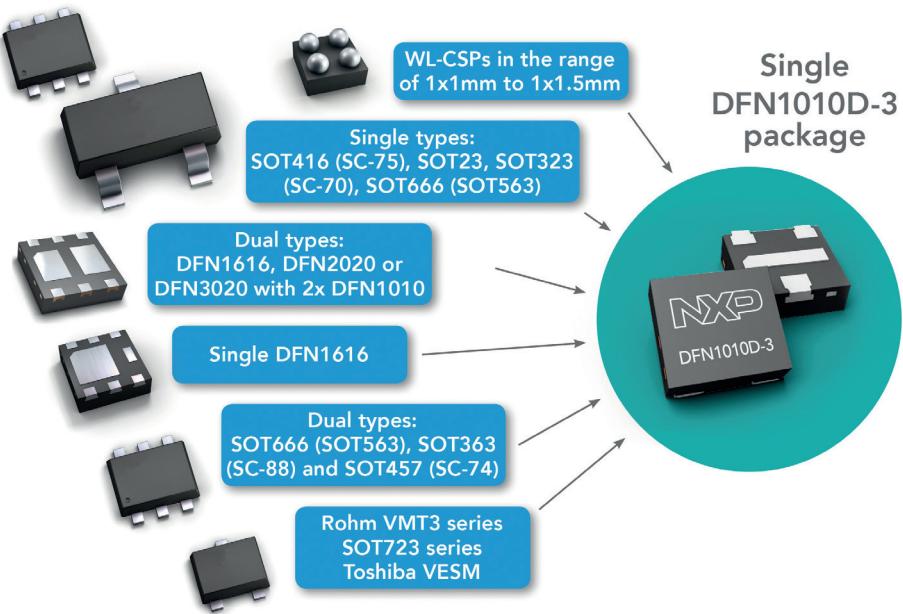
High power density



With a power dissipation density rating of 1000 mW per mm², the DFN1010D-3 package exceeds the performance of leaded packages like the SO8 by a factor of 16. The result is comparable thermal performance on a smaller mounting area, for smaller designs.

The next generation of small packaging – DFN1010

Featuring currents up to 3A on a 1.1 mm² footprint



Dual DFN1010 types

Replace larger packages with comparables R_{DSon} values

