

NXP leadless, 2 x 2 mm SOT1061 and SOT1118 packages

Fit more functions on a PCB with small, thin medium-power packages

These leadless, medium-power SMD packages measure only 2 x 2 x 0.65 mm and provide excellent electrical and thermal performance. They enable high integration for a range of functions, from low V_{CEsat} (BISS) transistors and low V_F (MEGA) Schottky rectifiers to P-channel MOSFETs and FET-KYs.

Key features

- ▶ Leadless, medium-power packages
- ▶ 3-lead (SOT1061) and 6-lead (SOT1118) versions
- ▶ Exposed heat sink for excellent thermal and electrical performance ($P_{tot} > 1\text{ W}$)
- ▶ Broad portfolio supports all kinds of applications
- ▶ Small dimensions: 2 x 2 x 0.65 mm
- ▶ Ideal for mobile and battery-driven applications
- ▶ Free of halogens and antimony oxides
- ▶ Non-flammability classification UL 94V-0 and RoHS standards compliance

Key benefits

- ▶ Optimum power performance while saving space
- ▶ Reduced size enables higher integration for smaller designs
- ▶ Energy savings
- ▶ Similar performance as other medium-power packages, such as SOT89 (SC-62) and SOT457 (SC-74), in a much smaller footprint

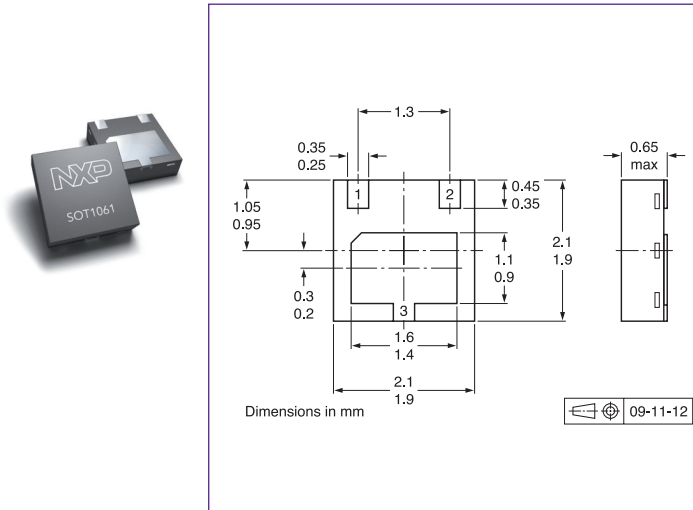
Key applications

- ▶ Portable applications (mobile phones, DSCs, PDAs, etc.)
- ▶ Power management
- ▶ Load switches
- ▶ Battery chargers
- ▶ DC/DC converters
- ▶ LED driver circuits in LCD backlight units
- ▶ Switch Mode Power Supply (SMPS) in mobile equipment
- ▶ Notebooks

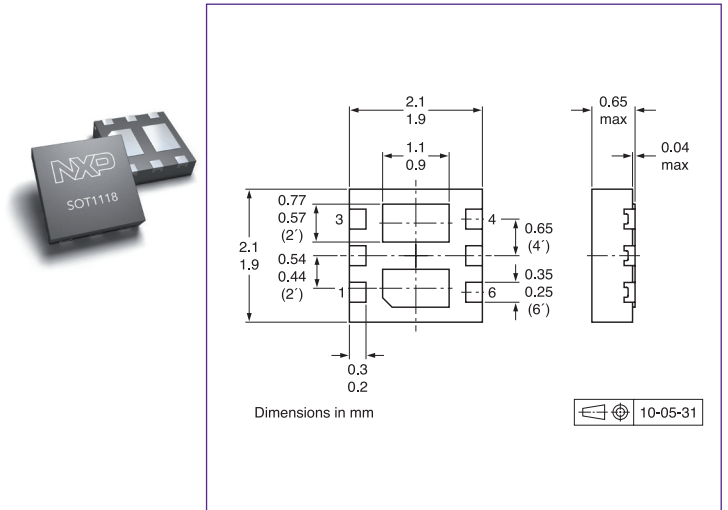


SOT1061 and SOT1118 package characteristics

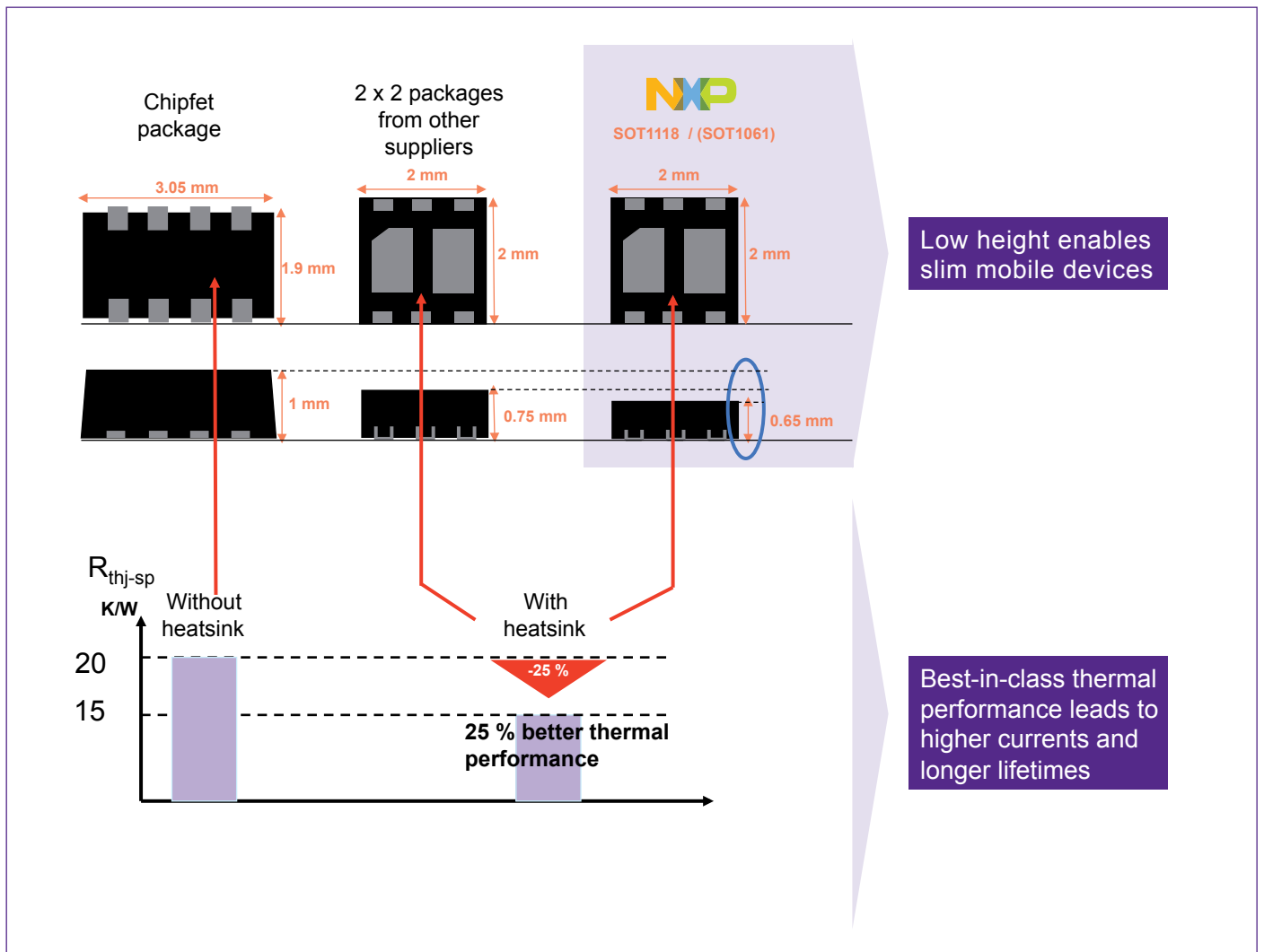
SOT1061 minimized outline



SOT1118 minimized outline



Package market comparison



P-channel MOSFET (dual) and FET-KYs in SOT1118

Features

- ▶ ESD protected MOSFET of > 1 kV HBM
- ▶ Very low $R_{DS(on)}$ of <70 m Ω at $V_{GS} = 4.5$ V
- ▶ 1.8 V $R_{DS(on)}$ rating for operation at low voltage gate drive levels
- ▶ Footprint compatible to SOT363 (SC-88)

Benefits

- ▶ Smallest 2 x 2 mm leadless FET-KY and dual P-channel MOSFET in the market with only 0.65 mm package height
- ▶ Best-in-class thermal performance due to new FET-KYs (PMFPB6532UP and PMFPB6545UP), which offer the industry's lowest on-resistance in the ESD-protected 20 V category
- ▶ Increased energy efficiency with lowest V_F of 365 mV and 520 mV @ 1 A respectively

Dual P-channel MOSFET in SOT1118

| Part number | Configuration | Polarity | ESD protection | V_{DSS} (V) | V_{GS} (V) | $R_{DS(on)}$ in mOhm | | |
|-------------|---------------|----------|----------------|---------------|--------------|----------------------|------------------|------------------|
| | | | | | | @ 4.5 V V_{GS} | @ 2.5 V V_{GS} | @ 1.8 V V_{GS} |
| PMDFPB65UP | Dual | P | yes | 20 | 8 | 70 | 90 | 150 |

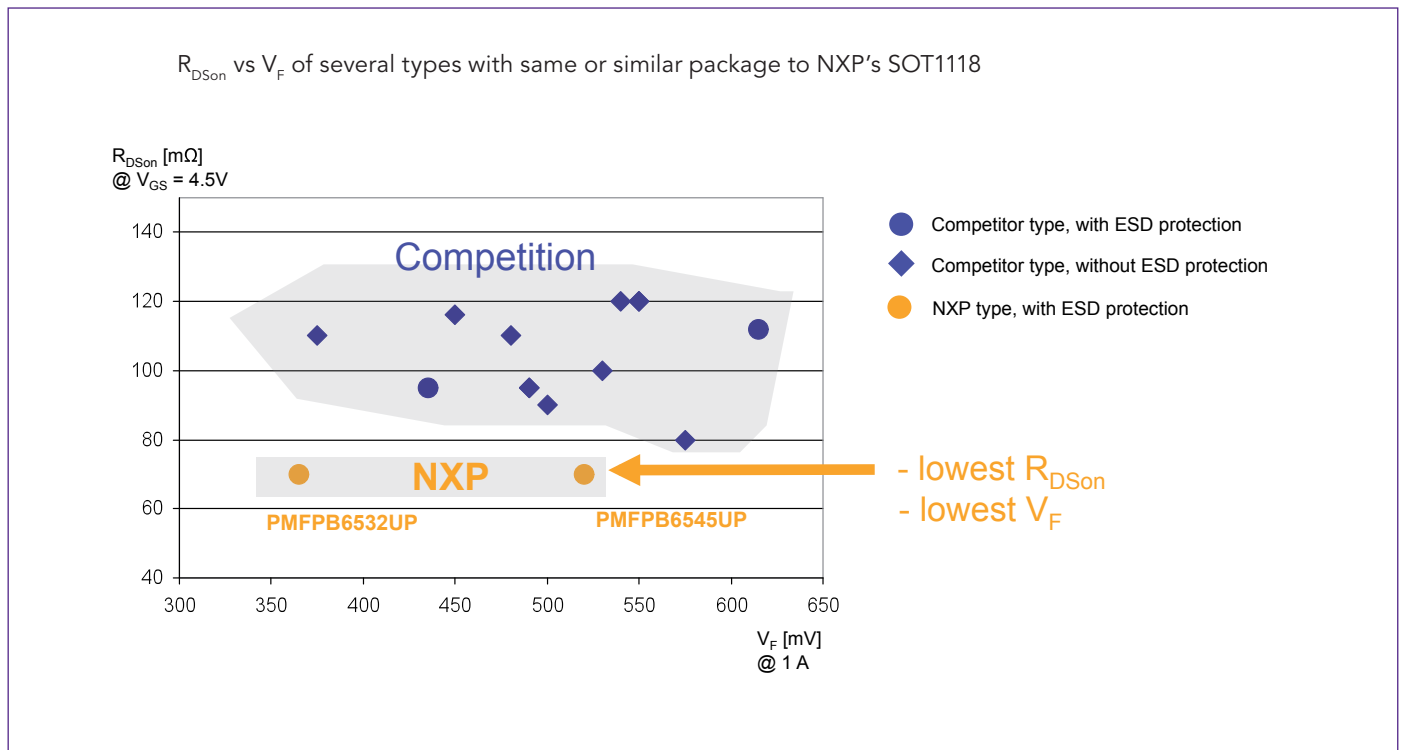
Types to be released soon (Samples available)

P-channel FET-KYs in SOT1118

| Part number | Configuration | Polarity | MOSFET | | | | | | Schottky diode | |
|-------------|---------------|----------|----------------|---------------|--------------|----------------------|------------------|------------------|----------------|------------------|
| | | | ESD protection | V_{DSS} (V) | V_{GS} (V) | $R_{DS(on)}$ in mOhm | | | V_F in mV | I_R in μ A |
| | | | | | | @ 4.5 V V_{GS} | @ 2.5 V V_{GS} | @ 1.8 V V_{GS} | @ 1 A | @ $V_R = 20$ V |
| PMFPB6532UP | FET-KY | P | yes | 20 | 8 | 70 | 90 | 150 | 365 | 700 |
| PMFPB6545UP | FET-KY | P | yes | 20 | 8 | 70 | 90 | 150 | 520 | 25 |

Types to be released soon (Samples available)

Comparison of available P-channel FET-KYs

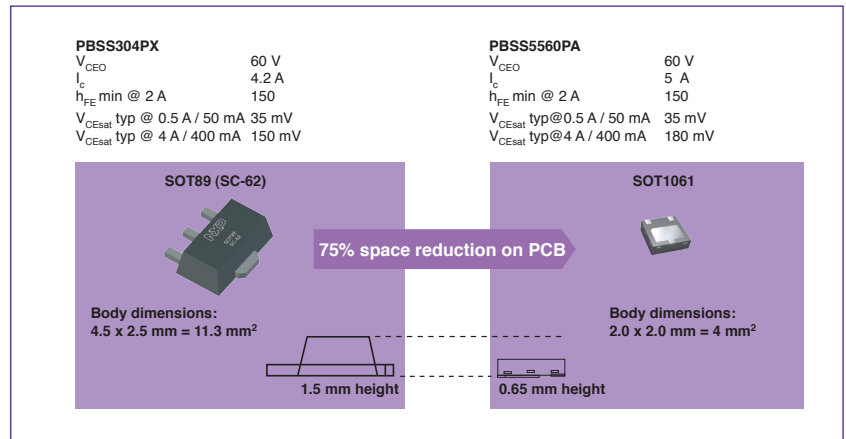


Low V_{CEsat} (BISS) transistors in SOT1061

Features

- ▶ Breakthrough in small-signal (BISS)
- ▶ DC collector current of up to 6 A (peak I_{CM} 7 A)
- ▶ Ultra-low saturation voltage V_{CEsat} down to 200 mV at 6 A collector current I_C
- ▶ Ultra-low saturation resistance R_{CEsat} of only 33 m Ω
- ▶ Full range of voltages: 12 to 100 V
- ▶ Replacing a SOT89 transistor with a SOT1061 product achieves similar performance in a 75 % smaller footprint.

Performance comparison SOT1061 versus SOT89

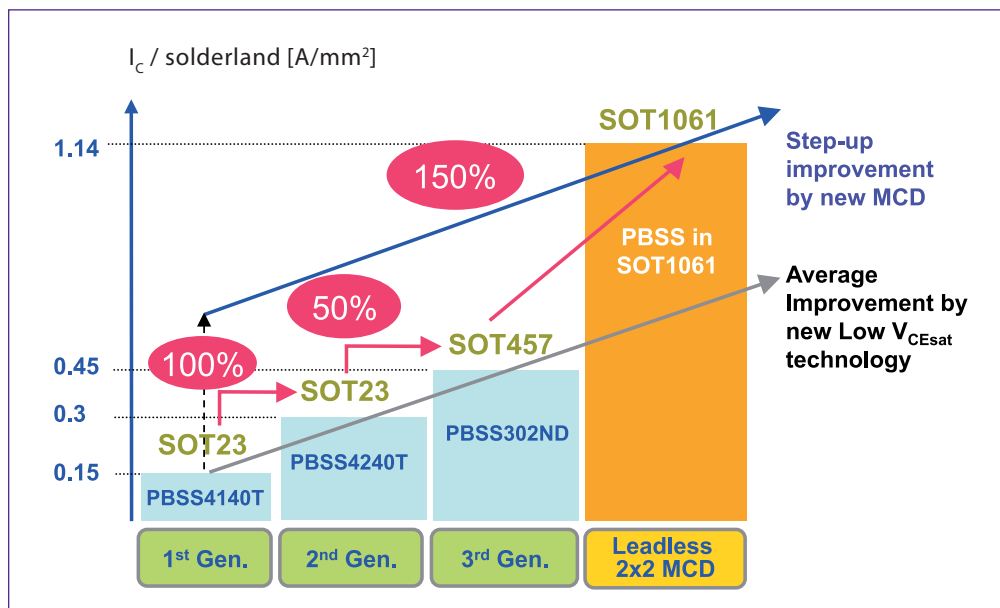


Low V_{CEsat} (BISS) transistors in SOT1061

| Type | Polarity | V_{CEO} (V) | I_C (A) | I_{CM} (A) | h_{FE} (min/typ) | R_{CEsat} typ (m Ω); @ 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 |

* $I_C/I_B = 10$

Improved power density with better rating for collector current versus PCB mounting area



Low V_F (MEGA) Schottky rectifier in SOT1061

Features

- ▶ High forward-current capability with low forward-voltage drop
- ▶ Housed in leadless medium-power SOT1061 package
- ▶ Five AEC-Q101-qualified types with
 - average forward current up to 2 A
 - reverse voltage range between 20 and 60 V.
 - integrated guard ring for stress protection
 - increased performance and higher efficiency compared to other alternatives

Medium power single Schottky rectifier in SOT1061

| I_F max (A) | V_R max (V) | V_F max (mV) @ I_F max | I_R max (mA) @ V_R max | Package | SOT1061 |
|---------------|---------------|----------------------------|----------------------------|---------------|------------------|
| | | | | | plastic SMD |
| | | | | Size (mm) | 2.0 x 2.0 x 0.65 |
| | | | | P_{tot} (W) | 0.96 |
| 1 | 20 | 375 | 1.9 | Low V_F | PMEG2010EPA |
| 2 | 20 | 420 | 1.9 | Low V_F | PMEG2020EPA |
| | 30 | 470 | 2.5 | Low V_F | PMEG3020EPA |
| | 40 | 535 | 0.1 | Low I_R | PMEG4020EPA |
| | 60 | 575 | 0.25 | Low I_R | PMEG6020EPA |

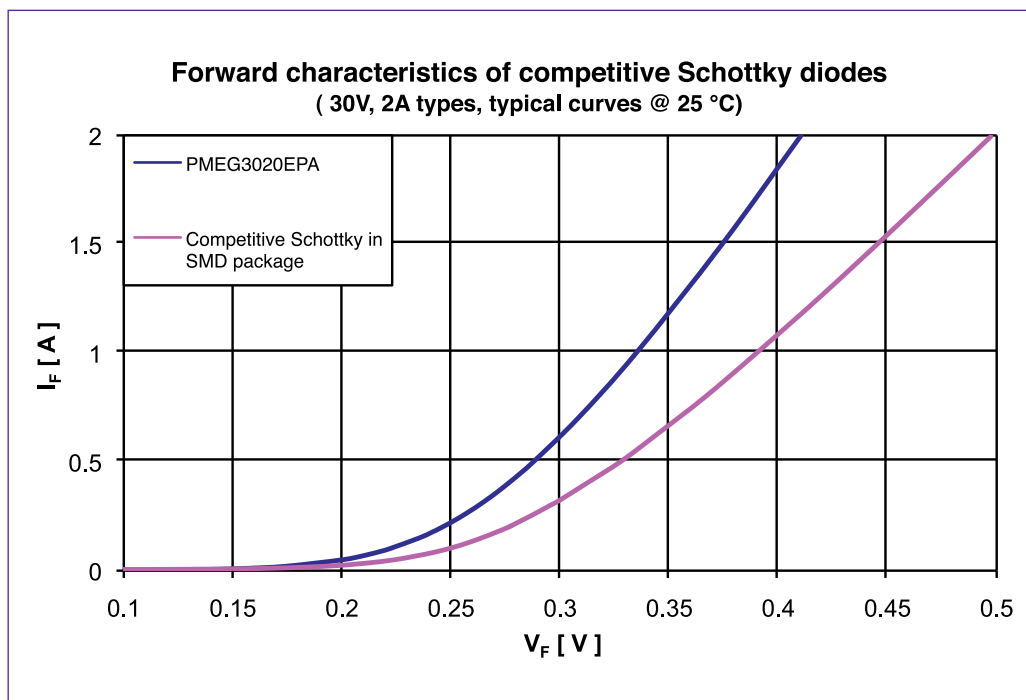
Medium power dual Schottky rectifier in SOT1061

Common cathode configuration

| I_F max (A) | V_R max (V) | V_F max (mV) @ I_F max | I_R max (mA) @ V_R max | Package | SOT1061 |
|---------------|---------------|----------------------------|----------------------------|---------------|------------------|
| | | | | | plastic SMD |
| | | | | Size (mm) | 2.0 x 2.0 x 0.65 |
| | | | | P_{tot} (W) | 0.96 |
| 2 | 20 | 420 | 1.1 | Low V_F | PMEG2020CPA |
| | 30 | 440 | 2 | Low V_F | PMEG3020CPA |
| 1 | 40 | 500 | 0.055 | Low I_R | PMEG4010CPA |
| | 60 | 540 | 0.070 | Low I_R | PMEG6010CPA |

Types to be released soon (Samples available)

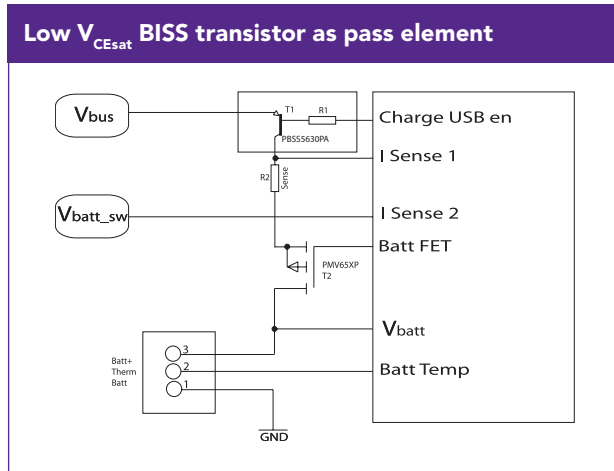
Better V_F characteristics due to improved design of die and SOT1061 package



Charger applications

The new SOT1061 and SOT1118 packages show best-in-class thermal performance and offer excellent electrical values in a very small footprint size.

Functions housed in these packages are well suited managing power in today's portable devices, especially in designs that use portable lithium-ion battery-charging circuits.



SOT1061

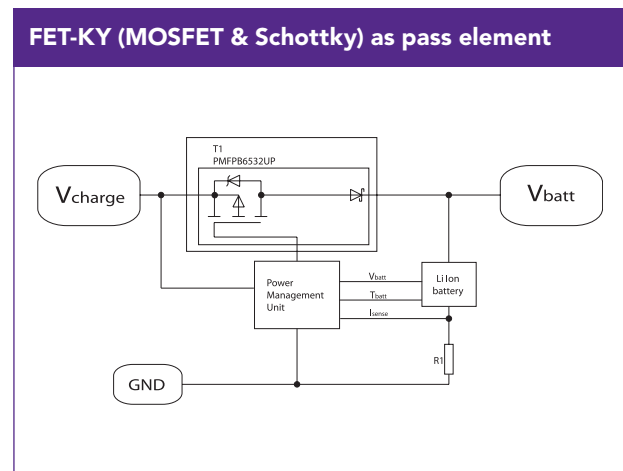
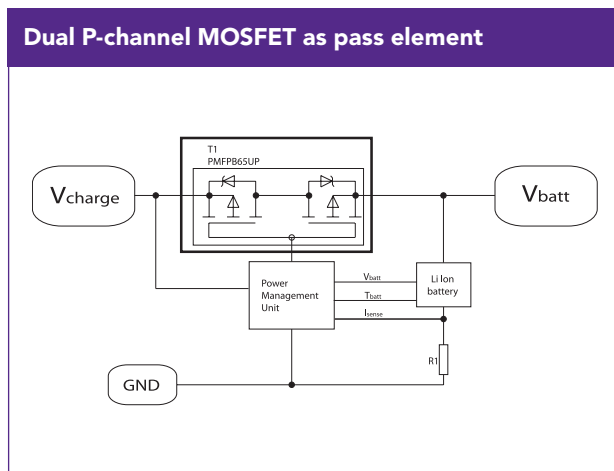


PBSS5330PA

- 30 V, 3 A low V_{CEsat} transistor

PBSS5630PA

- 30 V, 6 A low V_{CEsat} transistor



SOT1118

PMDPB65UP

Dual P-channel MOSFET
20 V V_{DS} , 70 m Ω R_{DSon}



PMFPB6545UP

70 m Ω P-channel MOSFET
455 mV V_F Schottky diode

PMFPB6532UP

70 m Ω P-channel MOSFET
325 mV V_F Schottky diode