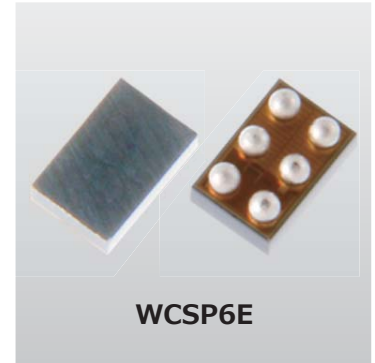


N-channel MOSFET driver ICs in industry-leading small package for mobile and consumer applications

“TCK401G” (active-high^[1]) and “TCK402G” (active-low^[2]) are N-channel MOSFET drivers that support an input voltage of up to 28 V, making them suitable for quick-charging and other applications requiring high current supply.

The new TCK401G and TCK402G have various built-in functions, including overvoltage protection, inrush current reducing and auto output discharge, but are still housed in the industry-leading^[3] small WCSP6E package, measuring 0.8×1.2×0.55 mm (typ.).

A high-efficiency power supply circuit can be realized by using new drivers with an external N-channel MOSFET that has a maximum voltage rating and On-resistance which are suitable for the target application. For example, the combination of a new MOSFET driver and the low-On-resistance MOSFET SSM6K513NU is suitable for mobile and consumer applications, as it makes it possible to build a 100 W class power supply circuit in a small space.



Features

- Large input operating voltage: $V_{IN_opr}=2.7$ to 28 V
- Small WCSP6E package: 0.8×1.2 mm, $t=0.55$ mm (typ.)
- Overvoltage protection, inrush current reducing, auto output discharge

Applications

- Mobile devices (Smart phone and tablet, etc.)
- Consumer equipment (Portable game machine, etc.)



Smartphones



Tablets

Product Specifications

(@ $T_a=25^\circ\text{C}$)

Part number	Package		Absolute maximum ratings Input voltage V_{IN} (V)	Input operation voltage V_{IN_opr} (V)	Input quiescent current $I_{Q(ON)}$ typ. @ $V_{IN}=5$ V (μA)	GATE drive voltage V_{GS} typ. (V)				V_{GATE} ON time t_{ON} typ. ^[4] @ $V_{IN}=5$ V, $V_{GATE}=6$ V, $C_{GATE}=2000$ pF (ms)	V_{GATE} OFF time t_{OFF} typ. ^[4] @ $V_{IN}=5$ V, $V_{GATE}=0.5$ V, $C_{GATE}=2000$ pF (μs)
	Name	Size typ. (mm)				@ $V_{IN}=3$ V	@ $V_{IN}=5$ V	@ $V_{IN}=9$ V	@ $12 \leq V_{IN} \leq 28$ V		
TCK401G (Active-high)	WCSP6E	0.8×1.2, $t=0.55$	40	2.7 to 28	121	4.0	6.5	6.5	8.5	0.58	16.6
TCK402G (Active-low)											

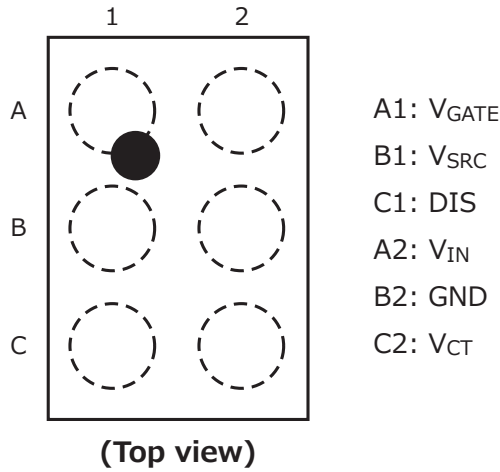
Notes: [1] When the mode control input terminal is high state, the external MOSFETs are turned on. When the mode control input terminal is low state, the external MOSFETs are turned off.

[2] When the mode control input terminal is low state, the external MOSFETs are turned on. When the mode control input terminal is high state, the external MOSFETs are turned off.

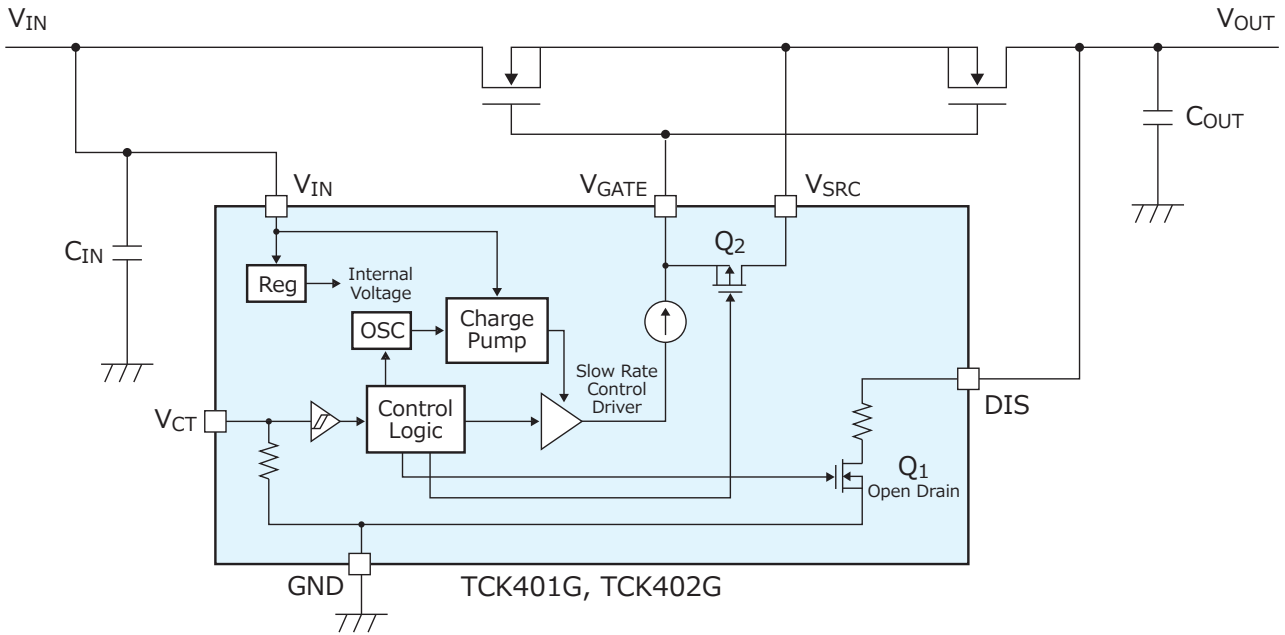
[3] As an N-channel MOSFET driver IC, as of September, 2017. Toshiba Electronic Devices & Storage Corporation survey.

[4] The time taken for the V_{GATE} to reach the defined value from when V_{CT} becomes half the value of V_{IH} .

Pin Assignment



Application Circuit Example



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