



TN6Q03 — Quasi-Resonant Switching Power Supply ExPD

ExPD (Excellent Power Device)

Features

- Quasi-resonant type original control IC.
- High voltage power MOSFET with current sense.
- Low input voltage protection (self reset)
- Overvoltage protection (latch).
- Overcurrent protection (pulse-by-pulse).

Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	unit
[All voltage parameters are absolute voltage referenced to GND]				
Drain-to-Source Voltage	V _{DSS}	3-5	650	V
Drain Current (DC)	I _D	3-5	4.5	A
Drain Current (Pulse)	I _{DP}	3-5 PW≤10μs, duty cycle≤1%	13.5	A
V _{DD} Pin Applied Voltage	V _{DD}	4-5	-0.3 to 16.7	V
FB Pin Applied Voltage	V _{FB}	1-5	-0.3 to V _{DD} +0.3	V
EDGE Pin Applied Voltage	V _{EDGE}	2-5	-0.3 to V _{DD} +0.3	V
Allowable Power Dissipation	P _D		2	W
		T _C =25°C	30	W
Operating Temperature	T _{opr}		-25 to +125	°C
Junction Temperature	T _J		150	°C
Storage Temperature	T _{stg}		-55 to +150	°C
Avalanche Energy (Single Pulse) *1	E _{AS}	3-5	105	mJ
Avalanche Current *2	I _{AV}	3-5	4.5	A

*1 V_{DD}=50V, L=10mH, I_{AV}=4.5A

*2 L≤10mH, single pulse

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TN6Q03

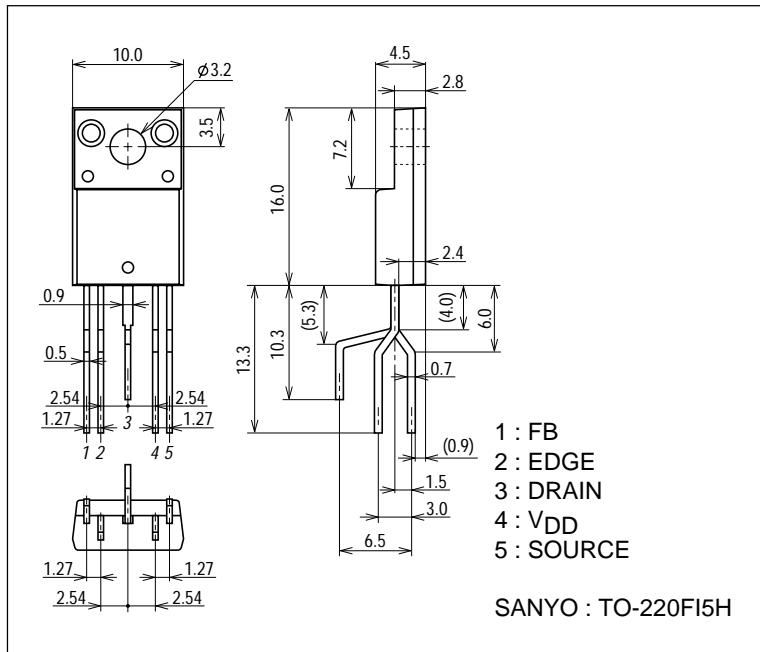
Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[MOSFET]						
Drain-to-Source Breakdown Voltage	V(BR)DSS	3-5 ID=1mA, VDD=0	650			V
Zero-Gate Voltage Drain Current	IDSS	3-5 VDS=650V, VDD=0			1	mA
Static Drain-to-Source On-State Resistance	RDS(on)	3-5 ID=2.3A, VDD=15V		1.55	2.0	Ω
Input Capacitance	Ciss	VDS=20V, f=1MHz		1150		pF
Output Capacitance	Coss	VDS=20V, f=1MHz		200		pF
[IC]						
Power Supply Line Breakdown Voltage	V(BR)DD	4-5 IDD=1mA, VFB=0	16.7			V
Overvoltage Input Latch Shutdown Threshold Voltage	OVP	4-5	15.7	16.5	17.3	V
Burst Mode Start Threshold Voltage	VBon	4-5 VEDGE=VDD	15.2	16.0	16.8	V
Burst Mode Stop Threshold Voltage	VBoff	4-5 VEDGE=VDD	14.6	15.4	16.2	V
Burst Mode Hysteresis Voltage	ΔVB	4-5 VEDGE=VDD		0.6		V
Low Voltage Protection Release Threshold Voltage	UVH	4-5	9.1	9.9	10.7	V
Low Voltage Protection Operation Threshold Voltage (Latch Reset Threshold Voltage)	UVL	4-5	8.0	8.8	9.6	V
Low Voltage Protection Hysteresis Voltage	ΔUV	4-5		1.1		V
Feedback Detection Threshold Voltage	VFB	1-5	0.58	0.70	0.82	V
Edge Signal Release Threshold Voltage	VEDGE-H	2-5	2.3	2.6	2.9	V
Edge Signal Detection Threshold Voltage	VEDGE-L	2-5	1.6	1.9	2.2	V
Edge Signal Hysteresis Voltage	ΔVEDGE	2-5		0.7		V
Reference Oscillation Frequency	fosc	3-5 VEDGE=0	30	35	40	kHz
Maximum Oscillation Frequency	fmax	3-5	150	180	210	kHz
Power Supply Current (at start-up)	IDD(on)	4-5		200		μA
Minimum ON Time	ton(min)	3-5		300		ns
Step Drive Voltage	tstep	3-5		200		ns
Step Drive Gate Voltage	VGstep	3-5		VDD-5.7		V

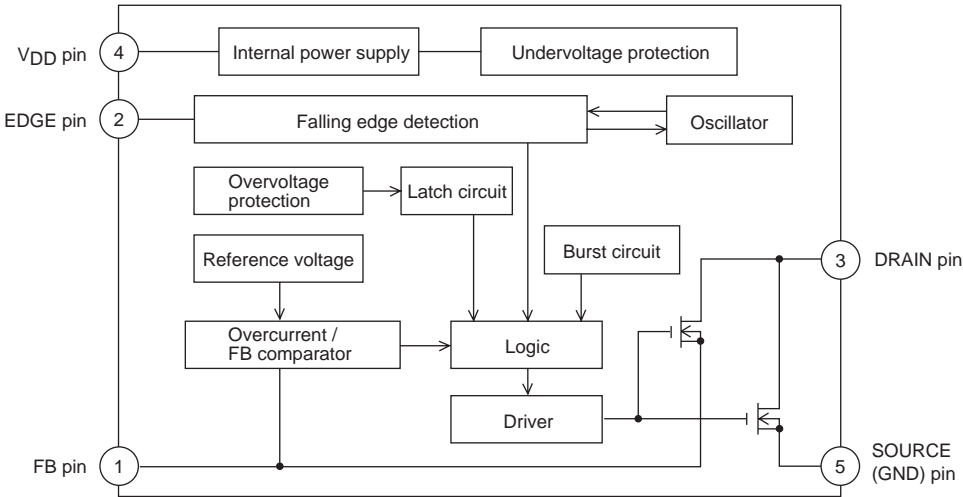
Package Dimensions

unit : mm

2249



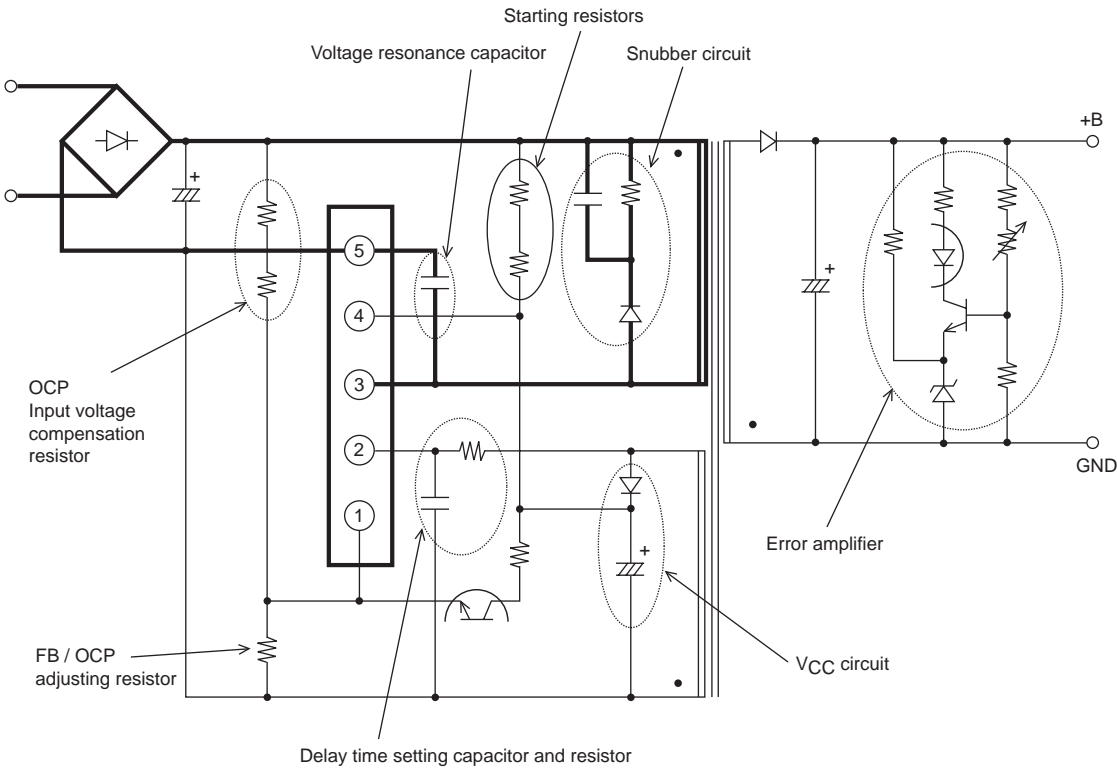
Block Diagram

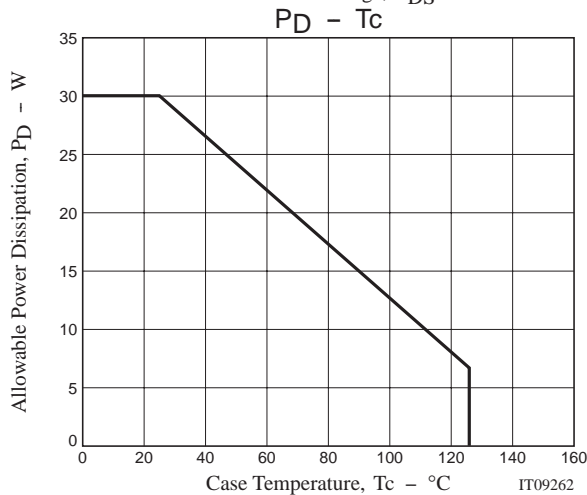
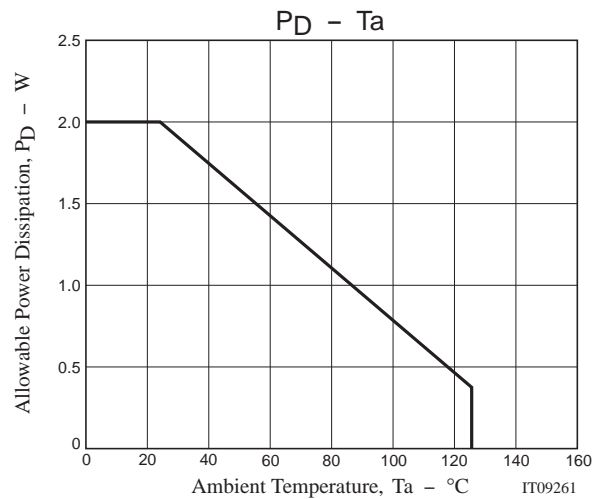
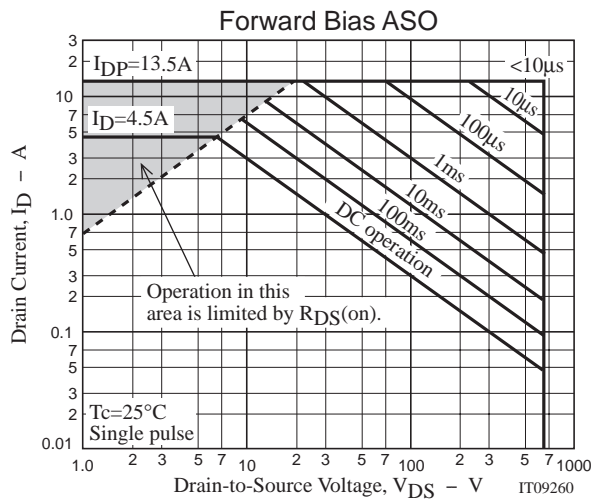


Pin Definitions and Functions

Pin No.	Symbol	Name	Function
1	FB	Overcurrent / feedback terminal	Overcurrent detection / voltage control input
2	EDGE	EDGE detection terminal	Delay EDGE voltage input
3	DRAIN	DRAIN terminal	Power MOSFET drain
4	VDD	Power supply terminal	Input for start-up voltage and drive voltage
5	SOURCE (GND)	Source (Ground) terminal	Power MOSFET source (ground)

Sample Application Circuit





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