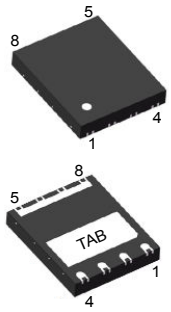
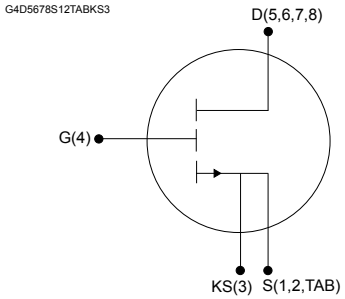
SGT100R70FDC

Data brief

700 V, 74 mΩ typ., 21 A, e-mode PowerGaN transistor



PowerFLAT 5x6 HV for PowerGaN



Features

Order code	V_{DS}	$R_{DS(on)}$ max.	I_D	Series
SGT100R70FDC	700 V	100 mΩ	21 A	G-HEMT

- Enhancement mode normally off transistor
- Very high switching speed
- High power management capability
- Extremely low capacitances
- Zero reverse recovery charge
- ESD safeguard

Applications

- AC-DC converters
- DC-DC converters
- USB type-C PD adapters and quick chargers
- Wireless charging

Description

The SGT100R70FDC is a 700 V, 21 A e-mode PowerGaN transistor. The resulting device provides extremely low conduction losses, high current capability and ultra-fast switching operation to enable high power density and unbeatable efficiency performances.

Product status link
SGT100R70FDC

Product summary	
Order code	SGT100R70FDC
Marking	100R70F
Package	PowerFLAT 5x6 HV for PowerGaN
Packing	Tape and reel

1 Electrical ratings

T_C = 25 °C unless otherwise specified.

Table 1. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{DS}	Drain-source voltage	700(1)	V
	Drain-source voltage (transient, t_p < 200 µs)	800	
V_{GS}	Gate-source voltage	-6 to 7	V
I_D	Drain current (continuous)	21	A
I_{DM}	Pulse drain current (t_p = 10 µs)	41	A
P_{TOT}	Total power dissipation at T_C = 25 °C	107	W
T_{stg}	Storage temperature range	-55 to 150	°C
T_J	Operating junction temperature range		°C

1. *Recommended continuous maximum bus voltage during switching operations should not exceed 450 V.*

Table 2. Thermal data

Symbol	Parameter	Value	Unit
R_{thJC}	Thermal resistance, junction-to-case	1.16	°C/W
R_{thJA}(1)	Thermal resistance, junction-to-ambient	69.94	°C/W

1. *When mounted on a standard 1 inch² area of FR-4 PCB with 2-oz copper.*

2 Electrical characteristics

T_C = 25 °C unless otherwise specified.

Table 3. Static

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{DSS}	Drain-source leakage current	V_{GS} = 0 V, V_{DS} = 700 V		0.8		µA
		V_{GS} = 0 V, V_{DS} = 700 V, T_J = 125 °C		9		
I_{GSS}	Gate-source leakage current	V_{DS} = 0 V, V_{GS} = 6 V		90		µA
$V_{GS(th)}$	Gate threshold voltage	V_{DS} = V_{GS}, I_D = 18.3 mA	1.2	1.7	2.5	V
$R_{DS(on)}$	Static drain-source on-resistance	V_{GS} = 6 V, I_D = 0.5 A		74	100	mΩ
		V_{GS} = 6 V, I_D = 6 A, T_J = 125 °C		148		

Table 4. Dynamic

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
C_{iss}	Input capacitance	V_{GS} = 0 V, V_{DS} = 400 V, f = 100 kHz	-	130	-	pF
C_{oss}	Output capacitance		-	47	-	pF
C_{rss}	Reverse transfer capacitance		-	0.5	-	pF
$C_{o(er)}$[1]	Equivalent output capacitance energy related	V_{GS} = 0 V, V_{DS} = 0 to 400 V	-	62.9	-	pF
$C_{o(tr)}$[2]	Equivalent output capacitance time related		-	83.4	-	pF
R_g	Intrinsic gate resistance	f = 5 MHz, I_D = 0 A	-	7	-	Ω
V_{plat}	Gate plateau voltage	V_{DS} = 400 V, I_D = 6 A	-	2.1	-	V
Q_g	Total gate charge	V_{GS} = 0 to 6 V, V_{DS} = 400 V, I_D = 6 A	-	3.4	-	nC
Q_{gs}	Gate-source charge		-	0.3	-	nC
Q_{gd}	Gate-drain charge		-	1.3	-	nC
Q_{rr}	Reverse recovery charge	V_{GS} = 0 V, V_{DS} = 400 V	-	0	-	nC
Q_{oss}	Output charge		-	32.7	-	nC

1. *$C_{o(er)}$ is a constant capacitance value that gives the same stored energy as C_{oss} while V_{DS} is rising from 0 to the stated value.*
2. *$C_{o(tr)}$ is a constant capacitance value that gives the same charging time as C_{oss} while V_{DS} is rising from 0 to the stated value.*

Table 5. Reverse conduction

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
V_{SD}	Source-drain reverse voltage	V_{GS} = 0 V, I_{SD} = 6 A	-	2.4	-	V

Revision history

Table 6. **Document revision history**

Date	Revision	Changes
08-Oct-2025	1	First release.

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