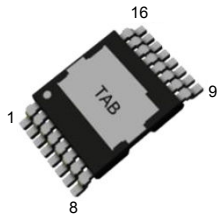
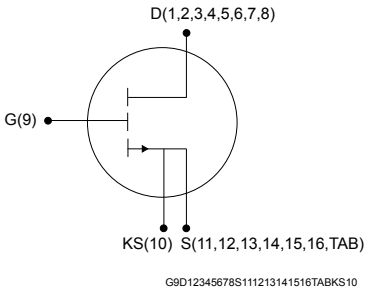
SGT023R70FTP

Data brief

700 V, 18 mΩ typ., e-mode PowerGaN transistor



TOLT



Features

Order code	V_{DS}	$R_{DS(on)}$ max.	I_D	Series
SGT023R70FTP	700 V	23 mΩ	TBD[1]	G-HEMT

1. TBD stands for "to be defined".

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

Applications

- Industrial
- Motor drive
- Totem and datacenter SMPS

Description

The SGT023R70FTP is a 700 V, 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
SGT023R70FTP

Product summary	
Order code	SGT023R70FTP
Marking	023R70F
Package	TOLT
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)	TBD	A
I_{DM}	Pulse drain current (t_p = 20 µs)	TBD	A
P_{TOT}	Total power dissipation at T_C = 25 °C	480	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	0.26	°C/W
R_{thJA}	Thermal resistance, junction-to-ambient	48.36(1)	°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		10	380	µA
		V_{GS} = 0 V, V_{DS} = 700 V, T_J = 125 °C		113		
I_{GSS}	Gate-source leakage current	V_{DS} = 0 V, V_{GS} = 6 V		284		µA
$V_{GS(th)}$	Gate threshold voltage	V_{DS} = V_{GS}, I_D = 94.8 mA	1.2	1.7	2.5	V
$R_{DS(on)}$	Static drain-source on-resistance	V_{GS} = 6 V, I_D = 2.5 A		18	23	mΩ
		V_{GS} = 6 V, I_D = 26 A, T_J = 125 °C		36		

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	-	818	-	pF
C_{oss}	Output capacitance		-	233	-	pF
C_{rss}	Reverse transfer capacitance		-	2.2	-	pF
$C_{o(er)}$ (1)	Equivalent output capacitance energy related	V_{GS} = 0 V, V_{DS} = 0 to 400 V	-	329	-	pF
$C_{o(tr)}$ (2)	Equivalent output capacitance time related		-	474	-	pF
R_g	Intrinsic gate resistance	f = 5 MHz, I_D = 0 A	-	2.8	-	Ω
V_{plat}	Gate plateau voltage	V_{DS} = 400 V, I_D = 26 A	-	2.1	-	V
Q_g	Total gate charge	V_{GS} = 0 to 6 V, V_{DS} = 400 V, I_D = 26 A	-	18.2	-	nC
Q_{gs}	Gate-source charge		-	1.7	-	nC
Q_{gd}	Gate-drain charge		-	5.7	-	nC
Q_{rr}	Reverse recovery charge	V_{GS} = 0 V, V_{DS} = 400 V	-	0	-	nC
Q_{oss}	Output charge		-	190	-	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} = 26 A	-	2.3	-	V

Revision history

Table 6. **Document revision history**

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

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