

700 V, 165 mΩ typ., 10 A, e-mode PowerGaN transistor

Features

Order code	V_{DS}	$R_{DS(on)}$ max.	I_D	Series
SGT240R70ITK	700 V	240 mΩ	10 A	G-HEMT

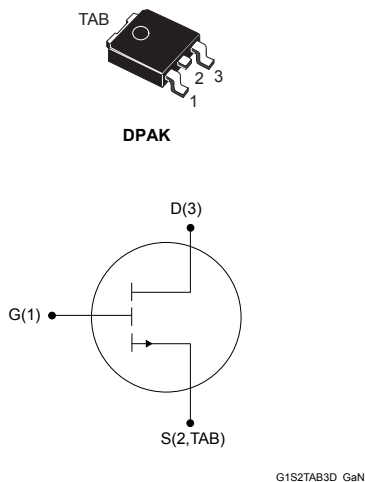
- Enhancement mode normally off transistor
- Very high switching speed
- High power management capability
- Extremely low capacitances
- Zero reverse recovery charge
- ESD safeguard

Applications

- Adapters for tablets, notebook and AIO
- DC-DC converters
- USB type-C PD adapters and quick chargers

Description

The **SGT240R70ITK** is a 700 V, 10 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

[SGT240R70ITK](#)

Product summary

Order code	SGT240R70ITK
Marking	240R70I
Package	DPAK
Packing	Tape and reel

1 Electrical ratings

$T_C = 25\text{ °C}$ unless otherwise specified.

Table 1. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{DS}	Drain-source voltage	700 ⁽¹⁾	V
	Drain-source voltage (transient, $t_p < 200\text{ }\mu\text{s}$)	800	
V_{GS}	Gate-source voltage	-6 to 7	V
I_D	Drain current (continuous) at $T_C = 25\text{ °C}$	10	A
I_{DM}	Pulse drain current ($t_p = 10\text{ }\mu\text{s}$)	18	A
P_{TOT}	Total power dissipation at $T_C = 25\text{ °C}$	77	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	1.62	°C/W
R_{thJA} ⁽¹⁾	Thermal resistance, junction-to-ambient	55	°C/W

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

2 Electrical characteristics

$T_C = 25\text{ }^{\circ}\text{C}$ unless otherwise specified.

Table 3. Static

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{DSS}	Drain-source leakage current	$V_{GS} = 0\text{ V}, V_{DS} = 700\text{ V}$		0.4	20	μA
		$V_{GS} = 0\text{ V}, V_{DS} = 700\text{ V}, T_J = 150\text{ }^{\circ}\text{C}$		5		
I_{GSS}	Gate-source leakage current	$V_{DS} = 0\text{ V}, V_{GS} = 6\text{ V}$		50		μA
$V_{GS(th)}$	Gate threshold voltage	$V_{DS} = V_{GS}, I_D = 11\text{ mA}$	1.2	1.7	2.5	V
$R_{DS(on)}$	Static drain-source on-resistance	$V_{GS} = 6\text{ V}, I_D = 3\text{ A}$		165	240	m Ω
		$V_{GS} = 6\text{ V}, I_D = 3\text{ A}, T_J = 150\text{ }^{\circ}\text{C}$		360		

Table 4. Dynamic

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
C_{iss}	Input capacitance	$V_{GS} = 0\text{ V}, V_{DS} = 400\text{ V}, f = 100\text{ kHz}$	-	79	-	pF
C_{oss}	Output capacitance		-	25	-	pF
C_{rss}	Reverse transfer capacitance		-	0.2	-	pF
$C_{o(er)}^{(1)}$	Equivalent output capacitance energy related	$V_{GS} = 0\text{ V}, V_{DS} = 0\text{ to }400\text{ V}$	-	36	-	pF
$C_{o(tr)}^{(2)}$	Equivalent output capacitance time related		-	52	-	pF
R_g	Intrinsic gate resistance	$f = 5\text{ MHz}, I_D = 0\text{ A}$	-	6	-	Ω
V_{plat}	Gate plateau voltage	$V_{DS} = 400\text{ V}, I_D = 3\text{ A}$	-	2.5	-	V
Q_g	Total gate charge	$V_{GS} = 0\text{ to }6\text{ V}, V_{DS} = 400\text{ V}, I_D = 3\text{ A}$	-	2	-	nC
Q_{gs}	Gate-source charge		-	0.2	-	nC
Q_{gd}	Gate-drain charge		-	0.7	-	nC
Q_{rr}	Reverse recovery charge	$V_{GS} = 0\text{ V}, V_{DS} = 400\text{ V}$	-	0	-	nC
Q_{oss}	Output charge		-	21	-	nC

- $C_{o(er)}$ 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.
- $C_{o(tr)}$ 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. Switching times

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-on delay time	$V_{DS} = 400\text{ V}, I_D = 6\text{ A}, V_{GS} = 6\text{ V},$ $R_{G(on)} = 10\text{ }\Omega, R_{G(off)} = 2\text{ }\Omega, L = 318\text{ }\mu\text{H}$	-	2	-	ns
t_r	Rise time		-	5	-	ns
$t_{d(off)}$	Turn-off delay time		-	4	-	ns
t_f	Fall time		-	6	-	ns

Table 6. Reverse conduction

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
V_{SD}	Source-drain reverse voltage	$V_{GS} = 0\text{ V}$, $I_{SD} = 3\text{ A}$	-	2.6	-	V

Revision history

Table 7. Document revision history

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

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