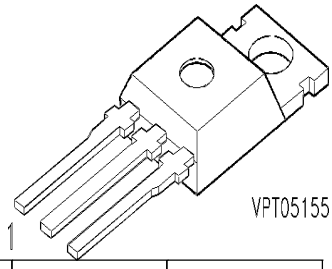
SIEMENS

Target data sheet

SIPMOS® Power Transistor

- N-Channel
- Enhancement mode
- Avalanche rated
- d*v*/d*t* rated
- 175°C operating temperature



Pin 1	Pin 2	Pin 3
G	D	S

Type	V_{DS}	I_D	$R_{DS(on)}$	@ V_{GS}	Package	Ordering Code
SPPXXN10 -	100 V	52 A	0.033 Ω	V_{GS} = 10 V	P-TO220-3-1 -	- -

Maximum Ratings, at T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Value	Unit
Continuous drain current T_C = 25 °C T_C = 100 °C	I_D	 52 36	A
Pulsed drain current T_C = 25 °C	I_{Dpulse}	208	
Avalanche energy, single pulse I_D = 52 A, V_{DD} = 25 V, R_{GS} = 25 Ω	E_{AS}	650	mJ
Avalanche current,periodic limited by T_{jmax}	I_{AR}	52	A
Avalanche energy,periodic limited by $T_{j(max)}$	E_{AR}	17.5	mJ
Reverse diode d*v*/d*t* I_S = 52 A, $V_{DD} \leq V_{(BR)DSS}$, d*i*/d*t* = 200 A/µs, T_{jmax} = 175 °C	d*v*/d*t*	6	kV/µs
Gate source voltage	V_{GS}	±20	V
Power dissipation T_C = 25 °C	P_{tot}	175	W
Operating temperature	T_j	-55 ... +175	°C
Storage temperature	T_{stg}	-55 ... +175	
IEC climatic category; DIN IEC 68-1		55/175/56	

Electrical Characteristics

Parameter at T_j = 25 °C, unless otherwise specified	Symbol	Values			Unit
		min.	typ.	max.	
Thermal Characteristics					
Thermal resistance, junction - case	R_{thJC}	-	tbd	0.85	K/W
Thermal resistance, junction - ambient	R_{thJA}	-	62.5	-	
SMD version, device on PCB:	R_{thJA}				
@ min. footprint		-	tbd	-	
@ 6 cm^2 cooling area[1)]		-	tbd	-	

Static Characteristics

Drain- source breakdown voltage V_{GS} = 0 V, I_D = 0.25 mA	$V_{(BR)DSS}$	100	-	-	V
Gate threshold voltage, V_{GS} = V_{DS} I_D = 0.75 mA	$V_{GS(th)}$	2.1	3	4	
Zero gate voltage drain current	I_{DSS}				µA
V_{DS} = 50 V, V_{GS} = 0 V, T_j = 25 °C		-	0.1	1	
V_{DS} = 50 V, V_{GS} = 0 V, T_j = 150 °C		-	-	100	
Gate-source leakage current V_{GS} = 20 V, V_{DS} = 0 V	I_{GSS}	-	10	100	nA
Drain-Source on-state resistance V_{GS} = 10 V, I_D = 36 A	$R_{DS(on)}$	-	-	0.033	Ω

1 Device on 50mm*50mm*1.5mm epoxy PCB FR4 with 6 cm2 (one layer, 70µm thick) copper area for drain connection. PCB is vertical without blown air.

Electrical Characteristics

Parameter at T_j = 25 °C, unless otherwise specified	Symbol	Values			Unit
		min.	typ.	max.	
Dynamic Characteristics					
Transconductance $V_{DS} \geq 2 * I_D * R_{DS(on)max}$, I_D = 36 A	g_{fs}	tbd	-	-	S
Input capacitance V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	C_{iss}	-	-	tbd	pF
Output capacitance V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	C_{oss}	-	-	tbd	
Reverse transfer capacitance V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	C_{rss}	-	-	tbd	
Turn-on delay time V_{DD} = 30 V, V_{GS} = 10 V, I_D = 52 A, R_G = 4.7 Ω	$t_{d(on)}$	-	-	tbd	ns
Rise time V_{DD} = 30 V, V_{GS} = 10 V, I_D = 52 A, R_G = 4.7 Ω	t_r	-	-	tbd	
Turn-off delay time V_{DD} = 30 V, V_{GS} = 10 V, I_D = 52 A, R_G = 4.7 Ω	$t_{d(off)}$	-	-	tbd	
Fall time V_{DD} = 30 V, V_{GS} = 10 V, I_D = 52 A, R_G = 4.7 Ω	t_f	-	-	tbd	

Electrical Characteristics

Parameter at T_j = 25 °C, unless otherwise specified	Symbol	Values			Unit
		min.	typ.	max.	
Dynamic Characteristics					
Gate charge at threshold V_{DD} = 0 V, I_D≥0,1 A, V_{GS} = 0 to 1 V	$Q_{G(th)}$	-	tbd	-	nC
Gate charge at V_{gs}=7V V_{DD} = 24 V, I_D = 52 A, V_{GS} = 0 to 7 V	$Q_{g(7)}$	-	tbd	-	nC
Gate charge total V_{DD} = 80 V, I_D = 52 A, V_{GS} = 0 to 10 V	Q_g	-	tbd	-	
Gate plateau voltage V_{DD} = - V, I_D = 52 A	$V_{(plateau)}$	-	tbd	-	V

Reverse Diode

Inverse diode continuous forward current T_C = 25 °C	I_S	-	-	52	A
Inverse diode direct current,pulsed T_C = 25 °C	I_{SM}	-	-	208	
Inverse diode forward voltage V_{GS} = 0 V, I_F = 104 A	V_{SD}	-	tbd	-	V
Reverse recovery time V_R = 80 V, I_F=I_S , di_F/dt = 100 A/µs	t_{rr}	-	-	tbd	ns
Reverse recovery charge V_R = 80 V, I_F=I_S , di_F/dt = 100 A/µs	Q_{rr}	-	-	tbd	µC

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