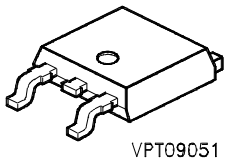
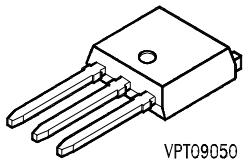
Cool MOSä Power Transistor

- N-Channel
- Enhancement mode
- Ultra low gate charge
- Avalanche rated
- d*v*/d*t* rated
- 150°C operating temperature





1	2	3
G	D	S

Type	V_{DS}	I_D	$R_{DS(on)}$	Marking	Package	Ordering Code
SPUX6N60S5	600 V	4.5 A	950 mΩ	X6N60S5	P-TO251-3-1	-
SPDX6N60S5					P-TO252	-

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

Parameter	Symbol	Value	Unit
Drain source voltage	V_{DSS}	600	V
Continuous drain current T_C = 25 °C T_C = 100 °C	I_D	 4.5 2.8	A
Pulsed drain current T_C = 25 °C	$I_{D\ puls}$	9	
Avalanche energy, single pulse I_D = 4.5 A, V_{DD} = 50 V, R_{GS} = 25 Ω	E_{AS}	140	mJ
Avalanche current (periodic, limited by T_{jmax})	I_{AR}	tbd	A
Avalanche energy (10 kHz, limited by T_{jmax})	E_{AR}	tbd	mJ
Reverse diode d*v*/d*t* I_S = 4.5 A, V_{DS}<V_{DSS}, d*i*/d*t* = 100 A/µs, T_{jmax} = 150 °C	d*v*/d*t*	6	KV/µs
Gate source voltage	V_{GS}	±20	V
Power dissipation, T_C = 25 °C	P_{tot}	50	W
Operating temperature	T_j	-55 ...+150	°C
Storage temperature	T_{stg}	-55 ... +150	
IEC climatic category; DIN IEC 68-1		55/150/56	

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}	-	-	2.5	K/W
Thermal resistance, junction - ambient (Leaded and through-hole packages)	R_{thJA}	-	100	-	
SMD version, device on PCB: @ min. footprint @ 6 cm^2 cooling area [1)]	R_{thJA}	 - -	 tbd tbd	 - -	
Static Characteristics					
Drain- source breakdown voltage V_{GS} = 0 V, I_D = 0.25 mA	$V_{(BR)DSS}$	600	-	-	V
Gate threshold voltage, V_{GS} = V_{DS} I_D = 200 µA, T_j = 25 °C I_D = 200 µA, T_j = 150 °C	$V_{GS(th)}$	 3.5 tbd	 4.5 -	 5.5 -	
Zero gate voltage drain current, V_{DS}=V_{DSS} V_{GS} = 0 V, T_j = -40 °C V_{GS} = 0 V, T_j = 25 °C V_{GS} = 0 V, T_j = 150 °C	I_{DSS}	 - - -	 - 0.5 -	 0.1 1 tbd	µA
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 = 2.8 A	$R_{DS(on)}$	-	tbd	950	mΩ

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.	
Characteristics					
Transconductance $V_{DS} \geq 2 * I_D * R_{DS(on)max}$, I_D = 2.8 A	g_{fs}	-	tbd	-	S
Input capacitance V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	C_{iss}	-	580	tbd	pF
Output capacitance V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	C_{oss}	-	375	tbd	
Reverse transfer capacitance V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	C_{rss}	-	20	tbd	
Turn-on delay time V_{DD} = 350 V, V_{GS} = 10 V, I_D = 4.5 A, R_G = 18 Ω	$t_{d(on)}$	-	tbd	tbd	ns
Rise time V_{DD} = 350 V, V_{GS} = 10 V, I_D = 4.5 A, R_G = 18 Ω	t_r	-	tbd	-	
Turn-off delay time V_{DD} = 350 V, V_{GS} = 10 V, I_D = 4.5 A, R_G = 18 Ω	$t_{d(off)}$	-	tbd	tbd	
Fall time V_{DD} = 350 V, V_{GS} = 10 V, I_D = 4.5 A, R_G = 18 Ω	t_f	-	tbd	-	

Electrical Characteristics

Parameter at T_j = 25 °C, unless otherwise specified	Symbol	Values			Unit
		min.	typ.	max.	
Gate Charge Characteristics					
Gate-source charge I_D = 4.5 A, V_{DD} = 400 V	Q_{gs}	-	tbd	-	nC
Gate-drain charge I_D = 4.5 A, V_{DD} = 400 V	Q_{gd}	-	tbd	-	
Total gate charge V_{DD} = 400 V, I_D = 4.5 A, V_{GS} = 0 to 10 V	Q_G	-	19	tbd	
Reverse Diode					
Continuous source current T_C = 25 °C	I_S	-	-	4.5	A
Pulsed source current T_C = 25 °C	I_{SM}	-	-	9	
Inverse diode forward voltage V_{GS} = 0 V, I_F = 4.5 A	V_{SD}	-	tbd	1.2	V
Reverse recovery time V_R = 100 V, I_F=I_S , di_F/dt = 100 A/µs	t_{rr}	-	tbd	-	ns
Reverse recovery charge V_R = 100 V, I_F=I_S , di_F/dt = 100 A/µs	Q_{rr}	-	tbd	-	µC

Edition 7.97
Published by Siemens AG,
Bereich Halbleiter Vetrieb,
Werbung, Balanstraße 73,
81541 München

Attention please!

As far as patents or other rights of third parties are concerned, liability is only assumed for components, not for applications, processes and circuits implemented within components or assemblies.
The information describes a type of component and shall not be considered as warranted characteristics.
Terms of delivery and rights to change design reserved.
For questions on technology, delivery and prices please contact the Semiconductor Group Offices in Germany or the Siemens Companies and Representatives worldwide (see address list).
Due to technical requirements components may contain dangerous substances. For information on the types in question please contact your nearest Siemens Office, Semiconductor Group.
Siemens AG is an approved CECC manufacturer.

Packing

Please use the recycling operators known to you. We can also help you - get in touch with your nearest sales office. By agreement we will take packing material back, if it is sorted. You must bear the costs of transport. For packing material that is returned to us unsorted or which we are not obliged to accept, we shall have to invoice you for any costs incurred.

Components used in life-support devices or systems must be expressly authorized for such purpose!

Critical components[1] of the Semiconductor Group of Siemens AG, may only be used in life-support devices or systems[2] with the express written approval of the Semiconductor Group of Siemens AG.

1)A critical component is a component used in a life-support device or system whose failure can reasonably be expected to cause the failure of that life-support device or system, or to affect its safety or effectiveness of that device or system.

2)Life support devices or systems are intended (a) to be implanted in the human body, or (b) to support and/or maintain and sustain and/or protecf human life. If they fail, it is reasonable to assume that the health of the