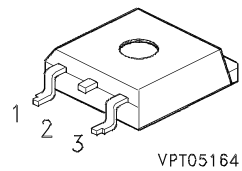
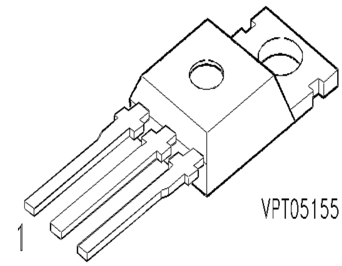
SIEMENS Target data sheet **SPPX2N60S5** **SPBX2N60S5**

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
SPPX2N60S5	600 V	11.3 A	380 mΩ	X2N60S5	P-TO220-3-1	-
SPBX2N60S5					P-TO263-3-2	-

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	 11.3 7.1	A
Pulsed drain current T_C = 25 °C	$I_{D\ puls}$	22.6	
Avalanche energy, single pulse I_D = 11.3 A, V_{DD} = 50 V, R_{GS} = 25 Ω	E_{AS}	340	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 = 11.3 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}	125	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}	-	-	1	K/W
Thermal resistance, junction - ambient (Leaded and through-hole packages)	R_{thJA}	-	62	-	
SMD version, device on PCB:	R_{thJA}				
@ min. footprint		-	tbd	-	
@ 6 cm^2 cooling area [1)]		-	35	-	

Static Characteristics

Parameter	Symbol	min.	typ.	max.	Unit
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}	$V_{GS(th)}$				
I_D = 0.5 mA, T_j = 25 °C		3.5	4.5	5.5	
I_D = 0.5 mA, T_j = 150 °C		tbd	-	-	
Zero gate voltage drain current, V_{DS}=V_{DSS}	I_{DSS}				µA
V_{GS} = 0 V, T_j = -40 °C		-	-	0.1	
V_{GS} = 0 V, T_j = 25 °C		-	0.5	1	
V_{GS} = 0 V, T_j = 150 °C		-	-	tbd	
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 = 7.1 A	$R_{DS(on)}$	-	tbd	380	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 = 7.1 A	g_{fs}	-	tbd	-	S
Input capacitance V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	C_{iss}	-	1500	tbd	pF
Output capacitance V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	C_{oss}	-	960	tbd	
Reverse transfer capacitance V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	C_{rss}	-	50	tbd	
Turn-on delay time V_{DD} = 350 V, V_{GS} = 10 V, I_D = 11.3 A, R_G = 6.8 Ω	$t_{d(on)}$	-	tbd	tbd	ns
Rise time V_{DD} = 350 V, V_{GS} = 10 V, I_D = 11.3 A, R_G = 6.8 Ω	t_r	-	tbd	-	
Turn-off delay time V_{DD} = 350 V, V_{GS} = 10 V, I_D = 11.3 A, R_G = 6.8 Ω	$t_{d(off)}$	-	tbd	tbd	
Fall time V_{DD} = 350 V, V_{GS} = 10 V, I_D = 11.3 A, R_G = 6.8 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 = 11.3 A, V_{DD} = 400 V	Q_{gs}	-	tbd	-	nC
Gate-drain charge I_D = 11.3 A, V_{DD} = 400 V	Q_{gd}	-	tbd	-	
Total gate charge V_{DD} = 400 V, I_D = 11.3 A, V_{GS} = 0 to 10 V	Q_G	-	50	tbd	

Reverse Diode

Continuous source current T_C = 25 °C	I_S	-	-	11.3	A
Pulsed source current T_C = 25 °C	I_{SM}	-	-	22.6	
Inverse diode forward voltage V_{GS} = 0 V, I_F = 11.3 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

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