

NST1P0C075K SiC Power MOSFET

1 Features and Benefits

- High Blocking Voltage with Low On-Resistance
- High Speed Switching with Low Capacitances
- Easy to Parallel and Simple to Drive
- Avalanche Ruggedness
- Halogen Free, RoHS Compliant
- Higher System Efficiency
- Reduced Cooling Requirements
- Increased Power Density
- Increased System Switching Frequency

3 Description

NST1P0C075K is a 750V SiC MOSFET that contributes to miniaturization and low power consumption of applications. By leveraging advanced SiC technology, it delivers a superior balance between conduction efficiency and switching speed.

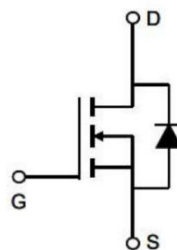
Device information

Part Number	Package	Device Marking
NST1P0C075K	TO252	NST1P0C075K

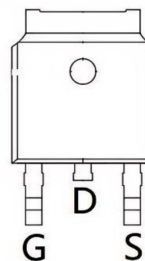
2 Application

- Solar Inverters
- Switch Mode Power Supplies
- High Voltage DC/DC Converters
- Battery Chargers
- Motor Drives
- Pulsed Power applications

TO252 Pin Configuration



Schematic Diagram



Pin Assignment



4 Selection Guide

Part Number	TYPE	R _{DS_(ON)}	VDS	VTH
NST1P0C075K	N	1Ω	750V	2.6V

5 Ordering Guide

Part Number	LOGO	Package
NST1P0C075K	 NST1P0C075K XXXXXX	TO252

6 Revision history

Version	Content	Time
V1.0	Create	2024.12.13

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7 Function Pin Description

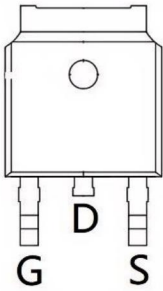


Figure7-1 3-Pin TO252 Top view

Table7-1 Lead Definitions

Symbol	Description
G	GATE
D	DRAIN
S	SOURCE

8 Product specifications

8.1 Absolute Maximum Ratings

PARAMETER	SYMBOL	MAX	UNIT
Drain-Source Voltage	V_{DS}	750	V
Gate-Source Voltage	V_{GS}	-8/+22	V
Drain Current-Continuous	$I_D(T_C=25^{\circ}C)$	3.5	A
	$I_D(T_C=100^{\circ}C)$	2.2	
Drain Current-Pulsed	I_{DM}	10	A
Maximum Power Dissipation	P_D	55	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 175	$^{\circ}C$

Thermal Characteristic

Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	2.7	$^{\circ}C/W$
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8.2 Electrical Characteristics (TA=25°C unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = 100\mu A$	750	--	--	V
Gate-Threshold Voltage	$V_{th(GS)}$	$V_{DS} = V_{GS}, I_D = 300\mu A, T_J=25^{\circ}C$	2.4	2.6	--	V
		$V_{DS} = V_{GS}, I_D = 300\mu A, T_J=150^{\circ}C$	--	1.8	--	V
Gate-Body Leakage	I_{GSS+}	$V_{DS} = 0V, V_{GS} = +22V$	--	10	100	nA
Gate-Body Leakage	I_{GSS-}	$V_{DS} = 0V, V_{GS} = -8V$	--	--	-200	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 650V, V_{GS} = 0V$	--	1	50	μA
Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS} = 18V, I_D = 2A, T_J=25^{\circ}C$	--	1	1.2	Ω
		$V_{GS} = 18V, I_D = 2A, T_J=125^{\circ}C$	--	1.5	--	Ω

Dynamic Characteristics

Input Capacitance	C_{iss}	$V_{DS} = 400V, V_{GS} = 0V, F = 1MHz$	--	67	--	pF
Output Capacitance	C_{oss}		--	8.5	--	
Reverse Transfer Capacitance	C_{rss}		--	0.8	--	

Switching Capacitance

Turn-On Delay Time	$t_{d(on)}$	$V_{DS} = 400V, R_L = 2.7\Omega, V_{GS} = 18V/-3V, L = 1.2mH$	--	8	--	ns
Turn-On Rise Time	t_r		--	12	--	ns
Turn-Off Delay Time	$t_{d(off)}$		--	20	--	ns
Turn-Off Fall Time	t_f		--	15	--	ns
Input Capacitance	C_{iss}	$V_{DS} = 400V, f = 1MHz, V_{GS} = 0V$	--	67	--	pf
Output Capacitance	C_{oss}		--	8.5	--	pf
Reverse Transfer Capacitance	C_{rss}		--	0.8	--	pf

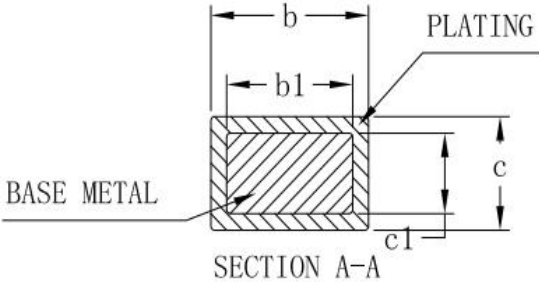
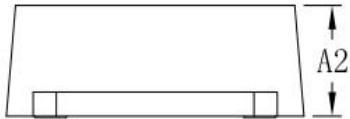
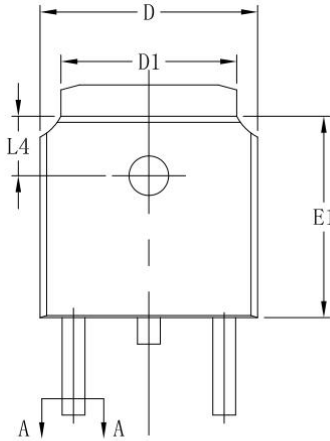
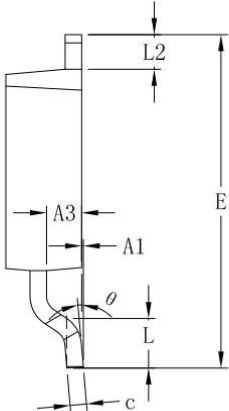
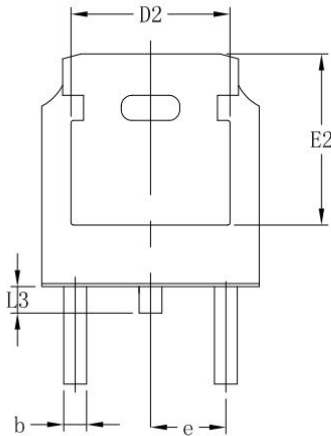
Drain-Source Diode Characteristics

Diode Forward Voltage	V_{SD}	$V_{GS} = -4V, I_{SD} = 1.5A, T_J=25^{\circ}C$	--	4.4	--	V
		$V_{GS} = -4V, I_{SD} = 1.5A, T_J=150^{\circ}C$	--	4.1	--	V

9 Package Information

TO-252 Package Information

SYMBOL	MILLIMETER			SYMBOL	MILLIMETER		
	MIN(mm)	TYP(mm)	MAX(mm)		MIN(mm)	NOM(mm)	MAX(mm)
A1	0.00	—	0.10	E	9.90	10.10	10.30
A2	2.20	2.30	2.40	E1	6.00	6.10	6.20
A3	1.02	1.07	1.12	E2	5.30REF		
b	0.65		0.77	e	2.286BSC		
b1	0.64	0.69	0.74	L	1.40	1.50	1.60
C	0.51	—	0.55	L2	0.90	—	1.25
c1	0.50	0.51	0.52	L3	0.60	0.80	1.00
D	6.50	6.60	6.70	L4	1.70	1.80	1.90
D1	5.33REF			θ	0		8°
D2	4.83REF						



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