

STN3PF06-VB Datasheet P-Channel 60-V (D-S) MOSFET

PRODUCT SUMMARY						
V _{DS} (V)	$R_{DS(on)}(\Omega)$	I _D (A) ^a	Q _g (Typ.)			
- 60	0.055 at V _{GS} = - 10 V	- 7.0	30 nC			
	0.065 at V _{GS} = - 4.5 V	- 6.0	30110			

FEATURES

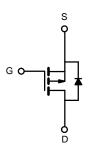
- TrenchFET® Power MOSFET
- 100 % UIS Tested

APPLICATIONS

Load Switch







P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS Parameter	- (A == =; sime	Symbol	Limit	Unit	
			- 60	Onn	
Drain-Source Voltage		V _{DS}		V	
Gate-Source Voltage		V_{GS}	± 20		
	$T_C = 25 ^{\circ}C$		- 7.0 ^a		
Continuous Drain Current (T _J = 150 °C)	T _C = 70 °C] ,	- 5.2		
Continuous Diain Current (1) = 130 °C)	T _A = 25 °C	I _D	- 4.8 ^b	А	
	T _A = 70 °C		- 4.1 ^b	A	
Pulsed Drain Current	<u>.</u>	I _{DM}	- 25		
Avalanche Current Pulse	L = 0.1 mH	I _{AS}	- 4.5		
Single Pulse Avalanche Energy	L = 0.1 IIII	E _{AS}	10.1	mJ	
Continuous Source-Drain Diode Current	T _C = 25 °C	_	6.9 ^a	А	
Continuous Source-Drain Diode Current	T _A = 25 °C	I _S	3.5 ^b	A	
	T _C = 25 °C		10.4 ^a		
	T _C = 70 °C		6.6 ^a	14/	
Maximum Power Dissipation	T _A = 25 °C	P _D	2.1 ^b	W	
	T _A = 70 °C	Ī	1.1 ^b	1.1 ^b	
Operating Junction and Storage Temperature Ra	ange	T _J , T _{stg}	- 55 to 150	°C	

THERMAL RESISTANCE RATINGS								
Parameter		Symbol	Typical	Maximum	Unit			
Maximum Junction-to-Ambient ^b	Steady State	R_{thJA}	33	40	°C/W			
Maximum Junction-to-Case	Steady State	R _{thJC}	0.98	1.2	C/VV			

Notes:

- a. Based on T_C = 25 °C.
- b. Surface mounted on 1" x 1" FR4 board.



Parameter	Symbol	Test Conditions	Min.	Тур.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V _{DS}	$V_{GS} = 0 \text{ V}, I_D = -250 \mu\text{A}$	- 60			V
V _{DS} Temperature Coefficient	$\Delta V_{DS}/T_{J}$	- I _D = - 250 μA		68		~~\//°C
V _{GS(th)} Temperature Coefficient	$\Delta V_{GS(th)}/T_{J}$	i _D = - 250 μA		- 5.2		mV/°C
Gate-Source Threshold Voltage	V _{GS(th)}	$V_{DS} = V_{GS}, I_{D} = -250 \mu A$	- 1.0		- 2.5	V
Gate-Source Leakage	I _{GSS}	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 20 \text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = - 60 V, V _{GS} = 0 V			- 1	μΑ
		$V_{DS} = -60 \text{ V}, V_{GS} = 0 \text{ V}, T_{J} = 55 \text{ °C}$			- 10	
On-State Drain Current ^a	I _{D(on)}	$V_{DS} = -5 \text{ V}, V_{GS} = -10 \text{ V}$	- 25			Α
Drain-Source On-State Resistance ^a		V _{GS} = - 10 V, I _D = - 3 A		0.055		
	R _{DS(on)}	$V_{GS} = -4.5 \text{ V}, I_D = -2 \text{ A}$		0.065		Ω
Forward Transconductance ^a	9 _{fs}	V _{DS} = - 15 V, I _D = - 5 A	20			S
Dynamic ^b			I.	•		
Input Capacitance	C _{iss}			1500		pF
Output Capacitance	C _{oss}	$V_{DS} = -25 \text{ V}, V_{GS} = 0 \text{ V}, f = 1 \text{ MHz}$		200		
Reverse Transfer Capacitance	C _{rss}			150		
Total Cata Charga	0	$V_{DS} = -30 \text{ V}, V_{GS} = -10 \text{ V}, I_{D} = -5 \text{ A}$		38	56	nC
Total Gate Charge	Qg			19	30	
Gate-Source Charge	Q_{gs}	$V_{DS} = -30 \text{ V}, V_{GS} = -4.5 \text{ V}, I_{D} = -5 \text{ A}$		9		
Gate-Drain Charge	Q _{gd}			10		
Gate Resistance	R _g	f = 1 MHz		5.2		Ω
Turn-On Delay Time	t _{d(on)}			10	15	
Rise Time	t _r	$V_{DD} = -2 V$, $R_L = 2 \Omega$		7	15	ns
Turn-Off Delay Time	t _{d(off)}	$I_D \cong$ - 5 A, V_{GEN} = - 10 V, R_g = 1 Ω		70	110	
Fall Time	t _f			40	60	
Drain-Source Body Diode Characteristic	s					
Continuous Source-Drain Diode Current	IS	$T_C = 25 ^{\circ}C$			- 6.9	۸
Pulse Diode Forward Current ^a	I _{SM}				- 15	A
Body Diode Voltage	V _{SD}	I _S = - 3 A		- 1	- 1.5	V
Body Diode Reverse Recovery Time	t _{rr}			45	68	ns
Body Diode Reverse Recovery Charge	Q _{rr}	L = 5 A di/dt = 10 A/vs T = 25 °C		59	120	nC
Reverse Recovery Fall Time	t _a	$I_F = -5 \text{ A}, \text{ di/dt} = 10 \text{ A/}\mu\text{s}, T_J = 25 \text{ °C}$		29		ns
Reverse Recovery Rise Time	t _b			16		

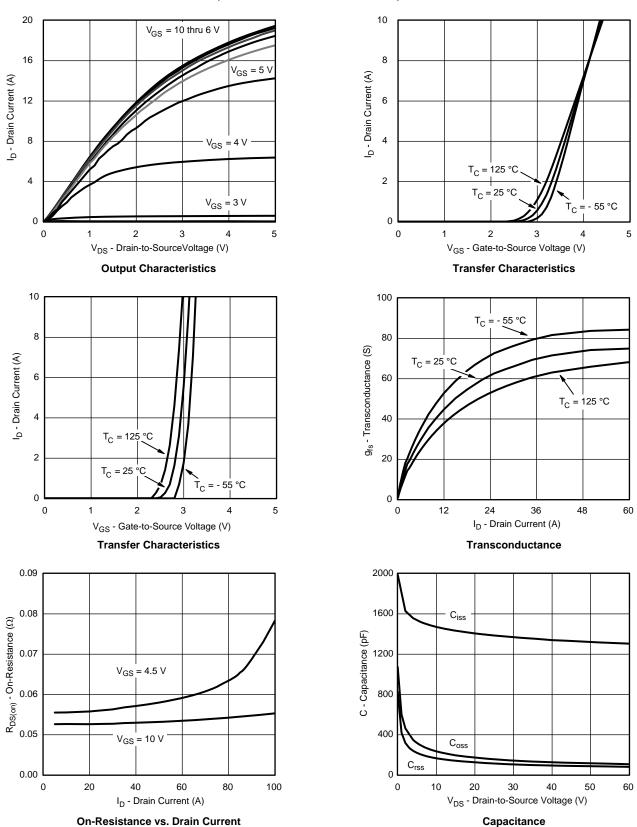
Notes:

- a. Pulse test; pulse width $\leq 300~\mu s,$ duty cycle $\leq 2~\%.$
- b. Guaranteed by design, not subject to production testing.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

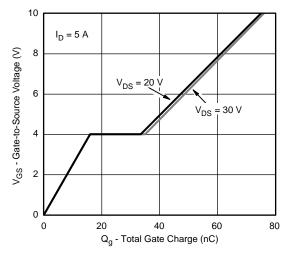


TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

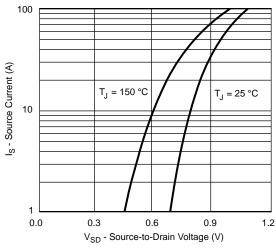




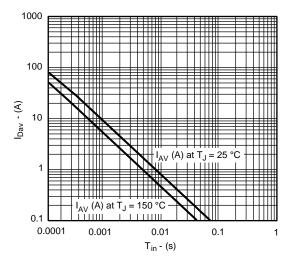
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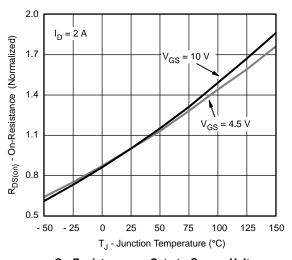




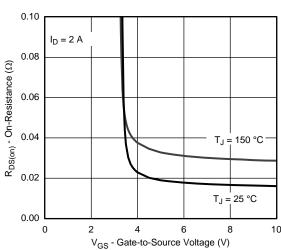
Source-Drain Diode Forward Voltage



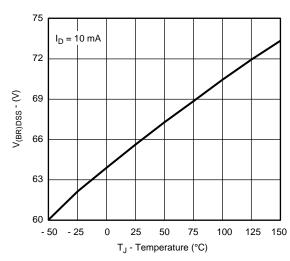
Single Pulse Avalanche Current Capability vs. Time



On-Resistance vs. Gate-to-Source Voltage



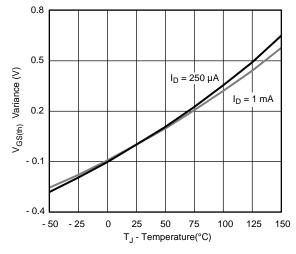
On-Resistance vs. Gate-to-Source Voltage

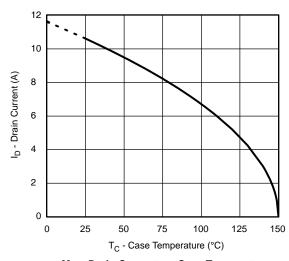


Drain-Source Breakdown Voltage vs. Junction Temperature

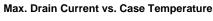


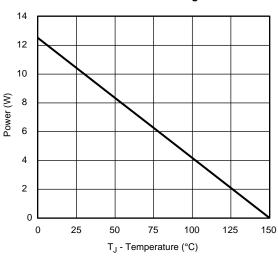
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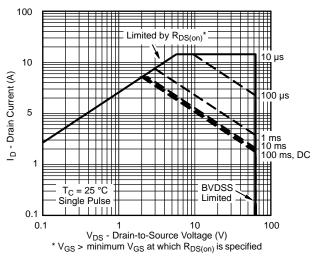




Threshold Voltage

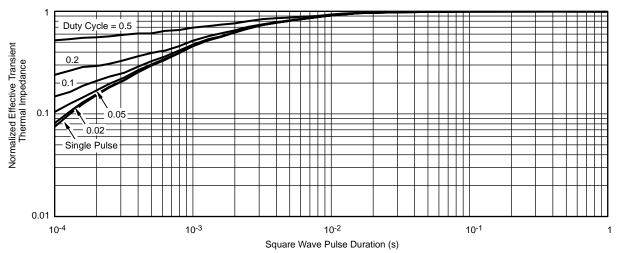






Power Derating, Junction-to-Case

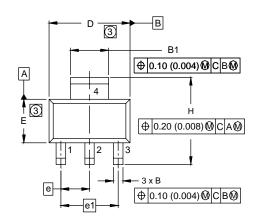
Safe Operating Area, Junction-to-Case

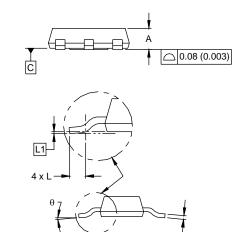


Normalized Thermal Transient Impedance, Junction-to-Case



SOT-223 (HIGH VOLTAGE)





DIM.	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
Α	1.55	1.80	0.061	0.071
В	0.65	0.85	0.026	0.033
B1	2.95	3.15	0.116	0.124
С	0.25	0.35	0.010	0.014
D	6.30	6.70	0.248	0.264
E	3.30	3.70	0.130	0.146
е	2.30	2.30 BSC		5 BSC
e1	4.60	4.60 BSC		BSC
Н	6.71	7.29	0.264	0.287
L	0.91	-	0.036	-
L1	0.061 BSC		0.0024	4 BSC
θ	-	10'	-	10'

ECN: S-82109-Rev. A, 15-Sep-08

DWG: 5969

Notes

- 1. Dimensioning and tolerancing per ASME Y14.5M-1994.
- 2. Dimensions are shown in millimeters (inches).
- 3. Dimension do not include mold flash.
- 4. Outline conforms to JEDEC outline TO-261AA.



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