



Solid State Devices, Inc.

14701 Firestone Blvd * La Mirada, CA 90638
Phone: (562) 404-4474 * Fax: (562) 404-1773
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DESIGNER'S DATA SHEET

Part Number / Ordering Information ^{1/}

SFC 200 N 90 P6

Screening ^{2/}

— = Not Screened
TX = TX Level
TXV = TXV Level
S = S Level

Lead Bend Options

— = Straight Leads
DB = Down Bend
UB = Up Bend

Package

P6 = 6 Pin TO-259
P6-1 = 6 Pin TO-259
without tabs

Voltage

90 = 900 V

Drain Current

200 = 200 A

SFC200N90

200 AMP, 900 VOLTS, 10 mΩ SiC Power MOSFET Enhancement Mode N-Channel

Features:

- Fast Switching, Low Capacitance
- High Blocking Voltage, Low $R_{DS(ON)}$
- Easy to Parallel, Simple to Drive
- Resistant to Latch-Up
- Hermetically Sealed Power Packaging
- TX, TXV, S-Level Screening Available

Applications:

- High Voltage DC-DC Converters
- PFC Boost Converters
- Switch Mode Power Supplies
- Motor Drive
- Aerospace, Hi-Rel, Military

Maximum Ratings ^{3/}

	Symbol	Value	Unit
Drain – Source Voltage	V_{DS}	900	V
Gate – Source Voltage, transient	V_{GS}	-8, +19	V
Gate – Source Voltage, continuous	V_{GS}	-4, +15	V
Continuous Drain Current $V_{GS} = 15\text{ V}, T_C = 25^\circ\text{C}$	I_{D1}	200	A
Pulsed Drain Current Pulse width t_P limited by T_{Jmax}	I_{D2}	800	A
Total Power Dissipation	P_D	428	W
Operating & Storage Temperature	$T_{OP} \text{ \& } T_{STG}$	-55 to +175	°C
Maximum Thermal Resistance Junction to Case	$R_{\theta JC}$	0.35 (typ 0.25)	°C/W

NOTES:

*Pulse Test: Pulse Width = 300 μsec , Duty Cycle = 2%.

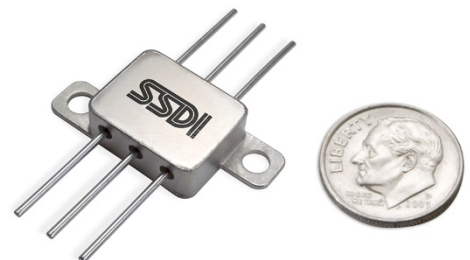
^{1/} For ordering information, price, and availability - contact factory.

^{2/} Screening based on MIL-PRF-19500. Screening flows available on request.

^{3/} Unless otherwise specified, all electrical characteristics @25°C.

^{5/} Ionizing Radiation (total dose) per Mil-Std-750 Method 1019 Condition A,
High Dose Rate, VDS bias of 720 V and VGS bias of 3.5 V.

6 Pin TO-259 (P6)



***dime used for size reference

NOTE: All specifications are subject to change without notification.
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SFC200N90

Electrical Characteristics ^{3/}		Symbol	Min	Typ	Max	Unit
Drain - Source Breakdown Voltage $V_{GS} = 0\text{ V}, I_D = 100\text{ }\mu\text{A}$		$V_{(BR)DSS}$	900	-	-	V
Gate Threshold Voltage $V_{DS} = V_{GS}, I_D = 66\text{ mA}$ $V_{DS} = V_{GS}, I_D = 66\text{ mA}, T_J = 175^\circ\text{C}$		$V_{GS(th)}$	1.4 -	2.0 1.7	3.5 -	V
Zero Gate Voltage Drain Current $V_{DS} = 900\text{ V}, V_{GS} = 0\text{ V}$		I_{DSS}	-	8	100	μA
Gate - Source Leakage $V_{GS} = 15\text{ V}, V_{DS} = 0\text{ V}$		I_{GSS}	-	5	250	nA
Drain - Source On-State Resistance* $V_{GS} = 15\text{ V}, I_D = 100\text{ A}$ $V_{GS} = 15\text{ V}, I_D = 100\text{ A}, T_J = 175^\circ\text{C}$		$R_{DS(on)}$	- -	7 17	10 -	m Ω
Forward Transconductance* $V_{DS} = 20\text{ V}, I_{DS} = 100\text{ A}$ $V_{DS} = 20\text{ V}, I_{DS} = 100\text{ A}, T_J = 175^\circ\text{C}$		g_{fs}	- -	79 71	- -	S
Input Capacitance	$V_{GS} = 0\text{ V}, V_{DS} = 600\text{ V}, f = 0.1\text{ MHz},$ $V_{AC} = 25\text{ mV}$	C_{iss}	-	9000	-	pF
Output Capacitance		C_{oss}	-	700	-	
Reverse Transfer Capacitance		C_{rss}	-	25	-	
C_{oss} Stored Energy $V_{GS} = 0\text{ V}, V_{DS} = 600\text{ V}, f = 0.1\text{ MHz}, V_{AC} = 25\text{ mV}$		E_{oss}	-	175	-	μJ
Internal Gate Resistance $V_{AC} = 25\text{ mV}, f = 1\text{ MHz}$		$R_{G(Int)}$	-	1.0	-	Ω
Gate to Source Charge	$V_{DS} = 600\text{ V}, V_{GS} = -4\text{ V} / 15\text{ V}$ $I_D = 100\text{ A}$	Q_{gs}	-	105	-	nC
Gate to Drain Charge		Q_{gd}	-	140	-	
Total Gate Charge		Q_g	-	420	-	
Reverse Diode Characteristics ^{3/}		Symbol	Min	Typ	Max	Unit
Diode Forward Voltage* $V_{GS} = -4\text{ V}, I_{SD} = 100\text{ A}$ $V_{GS} = -4\text{ V}, I_{SD} = 100\text{ A}, T_J = 175^\circ\text{C}$		V_{SD}	- -	4.4 4.0	- -	V
Reverse Recovery Time	$V_{GS} = -4\text{ V}, I_{SD} = 100\text{ A},$ $V_R = 600\text{ V}, \text{dif}/\text{dt} = 3750\text{ A}/\mu\text{s}, T_J$ $= 175^\circ\text{C}$	t_{rr}	-	36	-	ns
Reverse Recovery Charge		Q_{rr}	-	1350	-	nC

NOTES:

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3/ Unless otherwise specified, all electrical characteristics @25°C.

5/ Ionizing Radiation (total dose) per Mil-Std-750 Method 1019 Condition A, High Dose Rate, VDS bias of 720 V and VGS bias of 3.5 V.

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Radiation Performance

Electrical Characteristics: 50K rads (Si) ^{5/}		Symbol	Min	Typ	Max	Unit
Drain - Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 100\text{ }\mu\text{A}$	$V_{(BR)DSS}$	900	-	-	V
Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 66\text{ mA}$	$V_{GS(th)}$	1.4	1.8	3.5	V
Zero Gate Voltage Drain Current	$V_{DS} = 900\text{ V}, V_{GS} = 0\text{ V}$	I_{DSS}	-	12	100	μA
Gate - Source Leakage	$V_{GS} = 15\text{ V}, V_{DS} = 0\text{ V}$	I_{GSS}	-	12	250	nA
Drain - Source On-State Resistance	$V_{GS} = 15\text{ V}, I_D = 100\text{ A}$	$R_{DS(on)}$	-	7	10	m Ω

Electrical Characteristics: 100K rads (Si) ^{5/}		Symbol	Min	Typ	Max	Unit
Drain - Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 200\text{ }\mu\text{A}$	$V_{(BR)DSS}$	900	-	-	V
Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 66\text{ mA}$	$V_{GS(th)}$	1.4	1.6	3.5	V
Zero Gate Voltage Drain Current	$V_{DS} = 900\text{ V}, V_{GS} = 0\text{ V}$	I_{DSS}	-	16	100	μA
Gate - Source Leakage	$V_{GS} = 15\text{ V}, V_{DS} = 0\text{ V}$	I_{GSS}	-	12	250	nA
Drain - Source On-State Resistance	$V_{GS} = 15\text{ V}, I_D = 100\text{ A}$	$R_{DS(on)}$	-	7	10	m Ω

Electrical Characteristics: 300K rads (Si) ^{5/}		Symbol	Min	Typ	Max	Unit
Drain - Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 400\text{ }\mu\text{A}$	$V_{(BR)DSS}$	900	-	-	V
Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 66\text{ mA}$	$V_{GS(th)}$	1.0	1.2	3.5	V
Zero Gate Voltage Drain Current	$V_{DS} = 900\text{ V}, V_{GS} = 0\text{ V}$	I_{DSS}	-	160	400	μA
Gate - Source Leakage	$V_{GS} = 15\text{ V}, V_{DS} = 0\text{ V}$	I_{GSS}	-	12	250	nA
Drain - Source On-State Resistance	$V_{GS} = 15\text{ V}, I_D = 100\text{ A}$	$R_{DS(on)}$	-	7	10	m Ω

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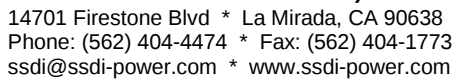
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