

# IFN5196, IFN5197, IFN5198, IFN5199

## N-Channel Matched Dual Silicon Junction Field-Effect Transistor

- Improved Replacement for the 2N5196, 2N5197, 2N5198, 2N5199
- Differential Inputs

**Absolute maximum ratings at T<sub>A</sub> = 25°C**  
 Reverse Gate Source & Gate Drain Voltage -50V  
 Continuous Forward Gate Current 50 mA  
 Continuous Device Power Dissipation 250 mW  
 Power Derating 2.6 mW/°C  
 Operating Temperature Range -55°C to +125°C  
 Storage Temperature Range -65°C to +150°C

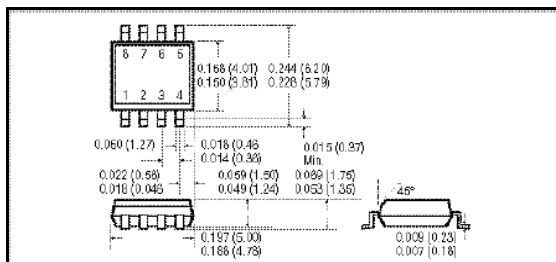
At 25°C free air temperature

Static Electrical Characteristics	IFN5196, IFN5197, IFN5198, IFN5199				Process NJ16	
	Min	Typ	Max	Unit	Test Conditions	
Gate Source Breakdown Voltage	V <sub>(BR)GSS</sub>	-50		V	I <sub>G</sub> = -1 uA, V <sub>DS</sub> = 0 V	
Gate Reverse Current	I <sub>GSS</sub>		-25 -50	pA nA	V <sub>GS</sub> = -30 V, V <sub>DS</sub> = 0 V 150°C	
Gate Current	I <sub>G</sub>		-50 -15	pA nA	V <sub>DG</sub> = 10 V, I <sub>D</sub> = -200 uA 125°C	
Gate Source Cutoff Voltage	V <sub>GS(OFF)</sub>	-0.7	-4	V	V <sub>DS</sub> = 20 V, I <sub>D</sub> = 1 nA	
Drain Saturation Current (pulsed)	I <sub>DSS</sub>	0.7	7	mA	V <sub>DS</sub> = 20 V, V <sub>GS</sub> = 0 V	
Gate Source Voltage	V <sub>GS</sub>	-0.2	-3.8	V	V <sub>DG</sub> = 20 V, I <sub>D</sub> = -200 uA	

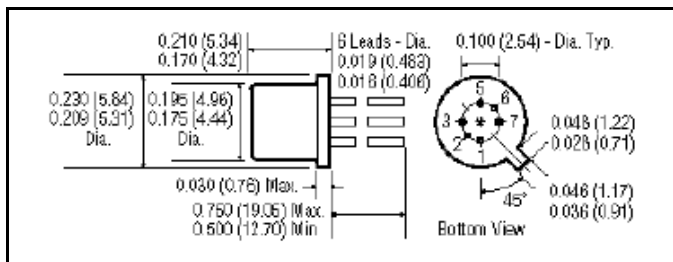
### Dynamic Electrical Characteristics

Common-Source Forward Transconductance	g <sub>fs</sub>	1		4	mS	V <sub>DS</sub> = 20 V, V <sub>GS</sub> = 0 V	f = 1 kHz
Common-Source Output Conductance	g <sub>os</sub>			50	μS	V <sub>DS</sub> = 20 V, V <sub>GS</sub> = 0 V	f = 1 kHz
Common-Source Input Capacitance	C <sub>iss</sub>			6	pF	V <sub>DS</sub> = 20 V, V <sub>GS</sub> = 0 V	f = 1 MHz
Common-Source Reverse Transfer Capacitance	C <sub>rss</sub>			2	pF	V <sub>DS</sub> = 20 V, V <sub>GS</sub> = 0 V	f = 1 MHz
Noise Factor R <sub>G</sub> = 10 MΩ	NF			0.5	dB	V <sub>DS</sub> = 20 V, V <sub>GS</sub> = 0 V	f = 100 Hz
Equivalent Short Circuit Input Noise Voltage	~e <sub>N</sub>			20	nV/√Hz	V <sub>DS</sub> = 20 V, V <sub>GS</sub> = 0 V	f = 1 kHz

		IFN5196		IFN5197		IFN5198		IFN5199		Units	Test Conditions
		Min	Max	Min	Max	Min	Max	Min	Max		
Differential Gate-Source Voltage	V <sub>GS1</sub> -V <sub>GS2</sub>		5		5		10		15	mV	V <sub>DG</sub> = 20 V, I <sub>D</sub> = -200 uA
Differential Gate Source Voltage with Temperature <sup>1</sup>	$\frac{\Delta  V_{GS1}-V_{GS2} }{\Delta T}$		5		10		20		40	μV/°C	V <sub>DG</sub> = 20 V, I <sub>D</sub> = -200 uA
Differential Gate Current @125°	I <sub>G1</sub> -I <sub>G2</sub>		5		5		5		5	nA	V <sub>DG</sub> = 20 V, I <sub>D</sub> = -200 uA
Saturation Drain Current Ratio	$\frac{I_{DSS1}}{I_{DSS2}}$	0.95	1	0.95	1	0.95	1	0.95	1		V <sub>DS</sub> = 20 V, V <sub>GS</sub> = 0 V
Transconductance Ratio @ f = 1 kHz	$\frac{g_{fs1}}{g_{fs2}}$	0.97	1	0.97	1	0.95	1	0.95	1		V <sub>DG</sub> = 20 V, I <sub>D</sub> = -200 uA
Differential Output Conductance @ f = 1 kHz	g <sub>os1</sub> -g <sub>os2</sub>		1		1		1		1	uS	V <sub>DG</sub> = 20 V, I <sub>D</sub> = -200 uA



**SOIC-8 Package Pin Configuration**  
 SMP5196, SMP5197, 1-G1, 2-D1, 3-S1, 4-G2,  
 SMP5198, SMP5199 5-G2, 6-D2, 7-S2, 8-G1



**TO-71 Pin Configuration**  
 IFN5196, IFN5197, 1-S1, 2-D1, 3-G1,  
 IFN5198, IFN5199 4-S2, 5-D2, 6-G2

Note 1: T = -55°C, 25°C, 125°C  
 Note 2: Dimensions in Inches (mm)



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