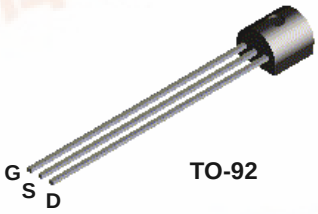
FAIRCHILD SEMICONDUCTOR TM

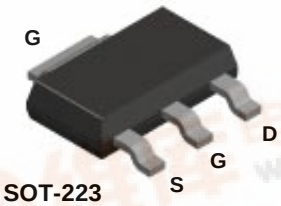
Discrete POWER & Signal Technologies

J105
J106
J107

JFTJ105



TO-92



SOT-223

N-Channel Switch

This device is designed for analog or digital switching applications where very low On Resistance is mandatory. Sourced from Process 59.

Absolute Maximum Ratings*

TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V_{DG}	Drain-Gate Voltage	25	V
V_{GS}	Gate-Source Voltage	- 25	V
I_{GF}	Forward Gate Current	10	mA
T_J, T_{stg}	Operating and Storage Junction Temperature Range	-55 to +150	°C

*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

NOTES:
1) These ratings are based on a maximum junction temperature of 150 degrees C.
2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

Thermal Characteristics

TA = 25°C unless otherwise noted

Symbol	Characteristic	Max	Units
		J105 / J106 / J107	
P_D	Total Device Dissipation Derate above 25°C	350 2.8	mW mW/°C
$R_{\theta JC}$	Thermal Resistance, Junction to Case	125	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	357	°C/W

N-Channel Switch
(continued)

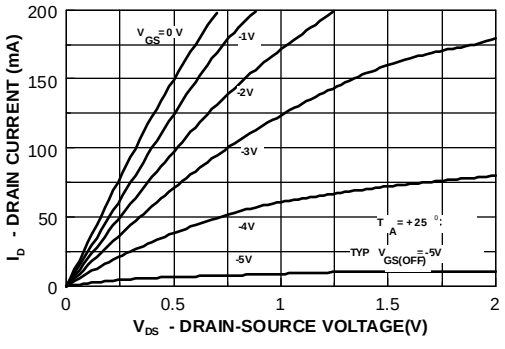
Electrical Characteristics
TA = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions		Min	Max	Units
OFF CHARACTERISTICS						
$V_{(BR)GSS}$	Gate-Source Breakdown Voltage	I_G = - 10 µA, V_{DS} = 0		- 25		V
I_{GSS}	Gate Reverse Current	V_{GS} = - 15 V, V_{DS} = 0			- 3.0	nA
		V_{GS} = - 15 V, V_{DS} = 0, T_A = 100°C			- 200	nA
$V_{GS(off)}$	Gate-Source Cutoff Voltage	V_{DS} = 15 V, I_D = 10 nA	**J105**	- 4.5	- 10	V
			J106	- 2.0	- 6.0	V
			J107	- 0.5	- 4.5	V
ON CHARACTERISTICS						
I_{DSS}	Zero-Gate Voltage Drain Current*	V_{DS} = 15 V, I_{GS} = 0	**J105**	500		mA
			J106	200		mA
			J107	100		mA
$r_{DS(on)}$	Drain-Source On Resistance	V_{DS} ≤ 0.1 V, V_{GS} = 0	**J105**		3.0	Ω
			J106		6.0	Ω
			J107		8.0	Ω
SMALL SIGNAL CHARACTERISTICS						
$C_{dg(on)}$ $C_{sg(on)}$	Drain Gate & Source Gate On Capacitance	V_{DS} = 0, V_{GS} = 10 V, f = 1.0 MHz			160	pF
$C_{dg(off)}$	Drain-Gate Off Capacitance	V_{DS} = 0, V_{GS} = 10 V, f = 1.0 MHz			35	pF
$C_{sg(off)}$	Source-Gate Off Capacitance	V_{DS} = 0, V_{GS} = 10 V, f = 1.0 MHz			35	pF

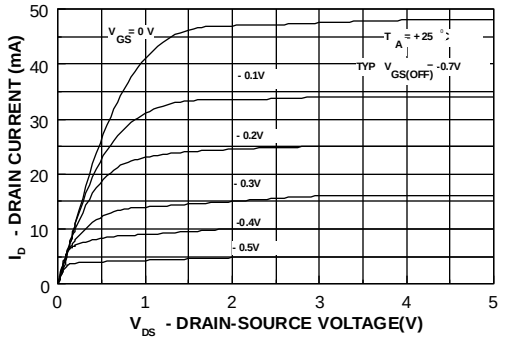
*Pulse Test: Pulse Width ≤ 300 µs, Duty Cycle ≤ 2.0%

Typical Characteristics

Common Drain-Source Characteristics

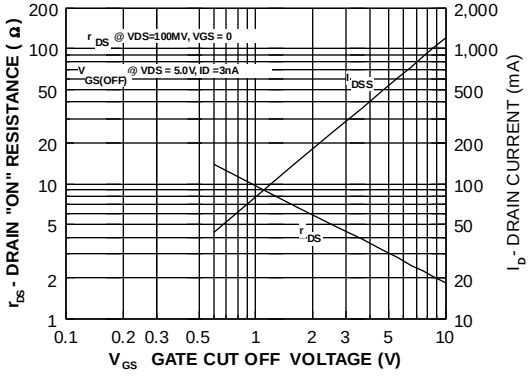


Common Drain-Source Characteristics

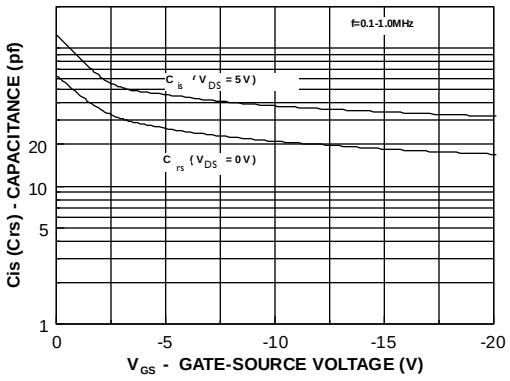


Typical Characteristics (continued)

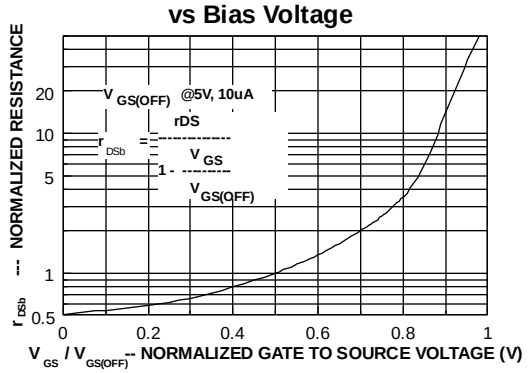
Parameter Interactions



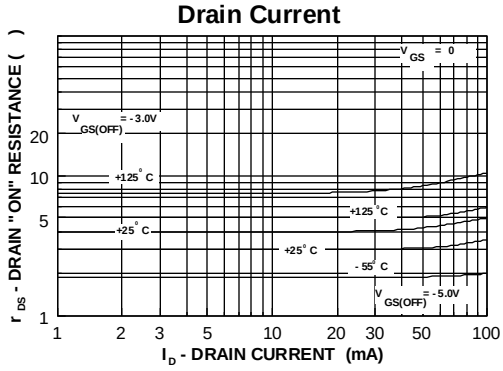
Capacitance vs Voltage



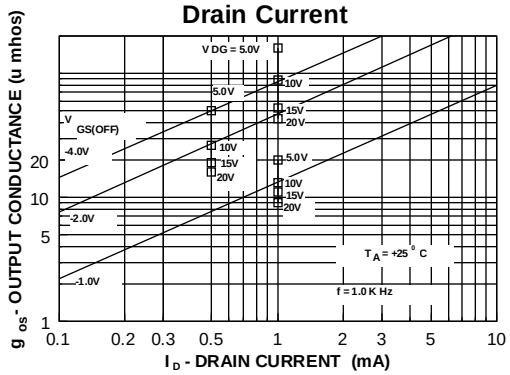
Normalized Drain Resistance vs Bias Voltage



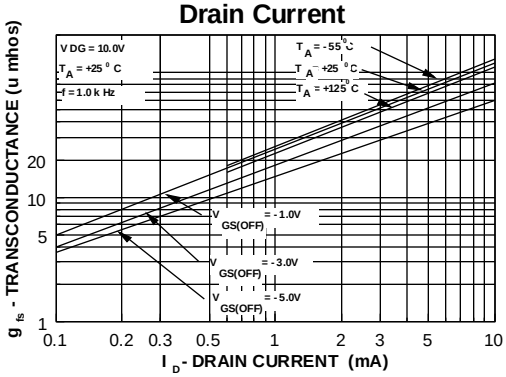
On Resistance vs Drain Current



Output Conductance vs Drain Current

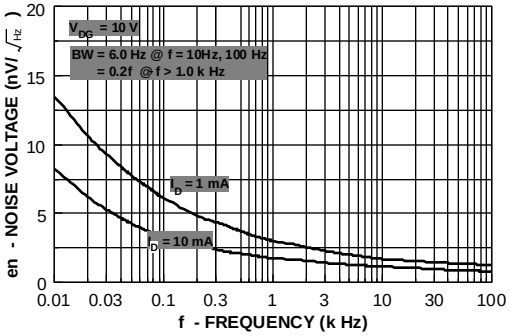


Transconductance vs Drain Current



Typical Characteristics (continued)

Noise Voltage vs Frequency



Power Dissipation vs Ambient Temperature