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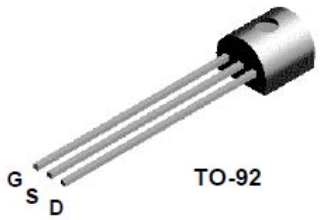
FAIRCHILD SEMICONDUCTOR®

September 2013

J105 / J106 / J107
N-Channel Switch

Description

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



Ordering Informations

Part Number	Marking	Package	Packing Method
J105	J105	TO-92 3L	Bulk
J106	J106		
J107	J107		

Absolute Maximum Ratings(1)

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at T_A = 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

Notes:

1. These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.
2. These ratings are based on a maximum junction temperature of 150°C.
3. These are steady-state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

Thermal Characteristics[4]

Values are at T_A = 25°C unless otherwise noted.

Symbol	Parameter	Maximum	Units
P_D	Power Dissipation	625	mW
	Derate above 25°C	5.0	mW/°C
$R_{\theta JC}$	Thermal Resistance, Junction to Case	125	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	357	°C/W

Note:

4. PCB board size FR-4 76 x 114 x 0.6T mm^3 (3.0 inch x 4.5 inch x 0.062 inch) with minimum land pattern size.

Electrical Characteristics

Values are at T_A = 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	
$I_{D(off)}$	Gate-Source Cut-Off Voltage	V_{DS} = -5.0 V, V_{GS} = -10 V			3.0	nA
$V_{GS(off)}$	Gate-Source Cut-Off Voltage	V_{DS} = 5.0 V, I_D = 1.0 mA	J105	-4.5	-10.0	V
			J106	-2.0	-6.0	
			J107	-0.5	-4.5	
ON CHARACTERISTICS						
I_{DSS}	Zero-Gate Voltage Drain Current[5]	V_{DS} = 15 V, I_{GS} = 0	J105	500		mA
			J106	200		
			J107	100		
$R_{DS(on)}$	Drain-Source On Resistance	V_{DS} ≤ 0.1 V, V_{GS} = 0	J105		3.0	Ω
			J106		6.0	
			J107		8.0	
SMALL SIGNAL CHARACTERISTICS						
$C_{dg(on)}$	Drain-Gate On Capacitance	V_{DS} = 0, V_{GS} = 10 V, f = 1.0 MHz			160	pF
$C_{sg(on)}$	Source-Gate On Capacitance					
$C_{dg(off)}$	Drain-Gate Off Capacitance				35	pF
$C_{sg(off)}$	Source-Gate Off Capacitance					pF

Note:

5. Pulse test: pulse width ≤ 300 μs, duty cycle ≤ 2.0%.

Typical Performance Characteristic

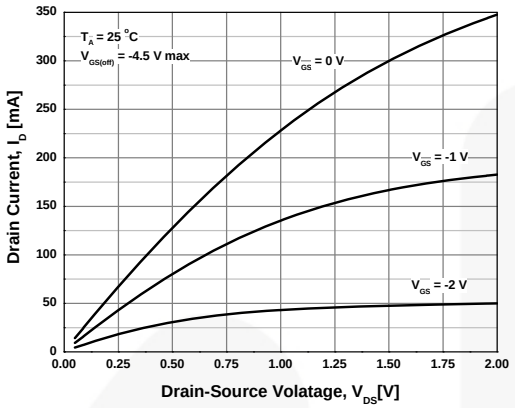


Figure 1. Common Drain-Source Characteristics

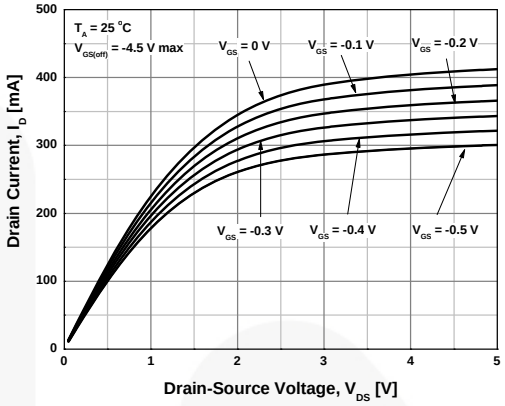


Figure 2. Common Drain-Source Characteristics

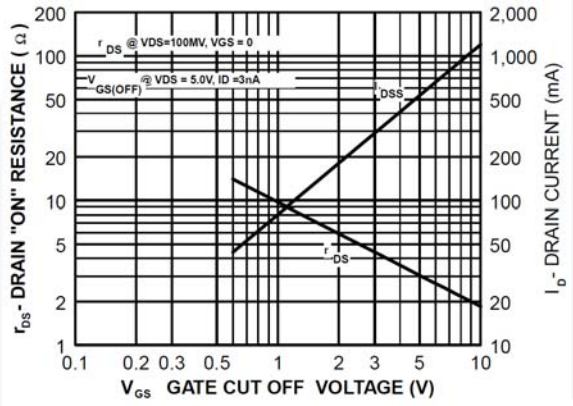


Figure 3. Parameter Interactions

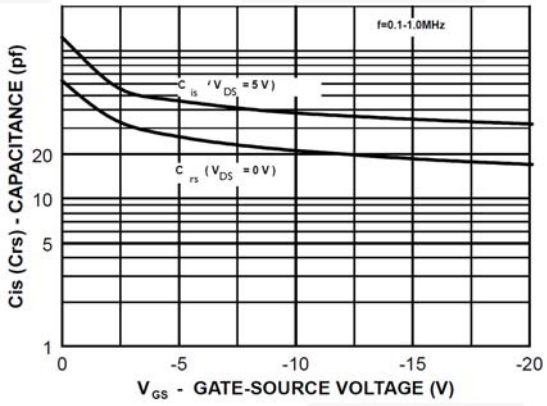


Figure 4. Capacitance vs. Voltage

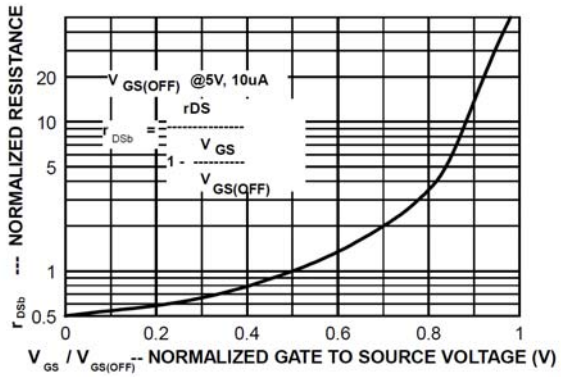


Figure 5. Normalized Drain Resistance vs. Bias Voltage

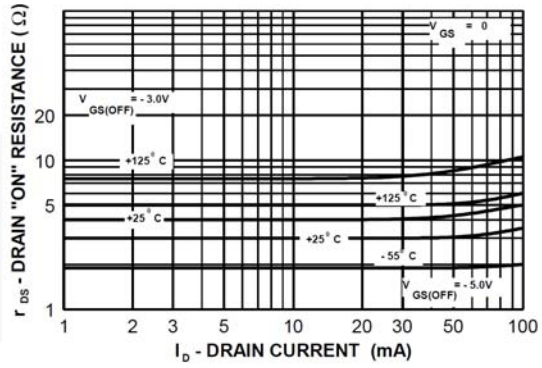


Figure 6. On Resistance vs. Drain Current

Typical Performance Characteristic (Continued)

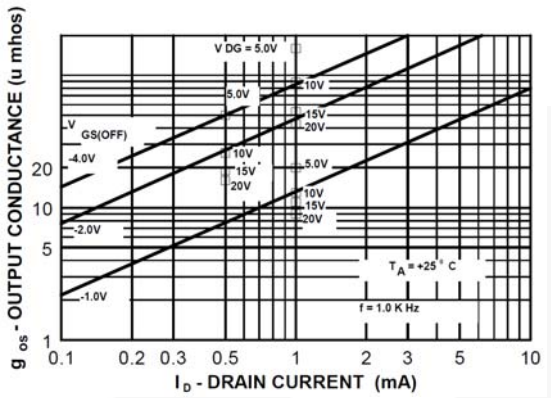


Figure 7. Output Conductance vs. Drain Current

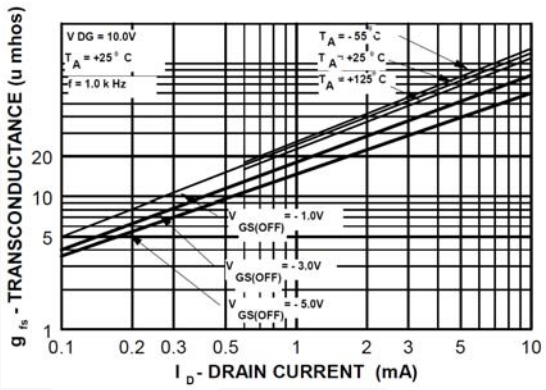


Figure 8. Transconductance vs. Drain Current

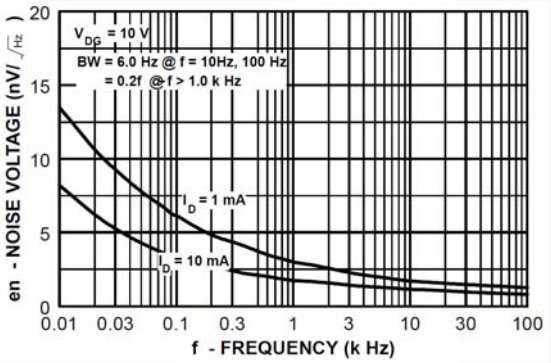


Figure 9. Noise Voltage vs. Frequency

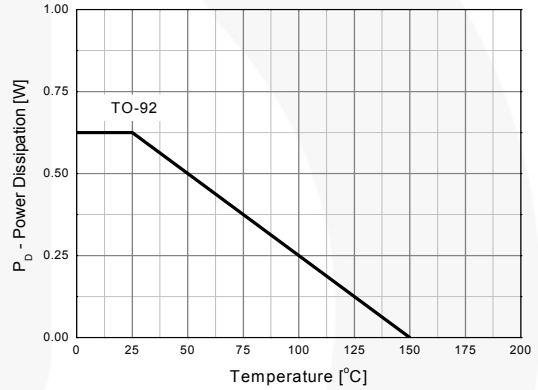
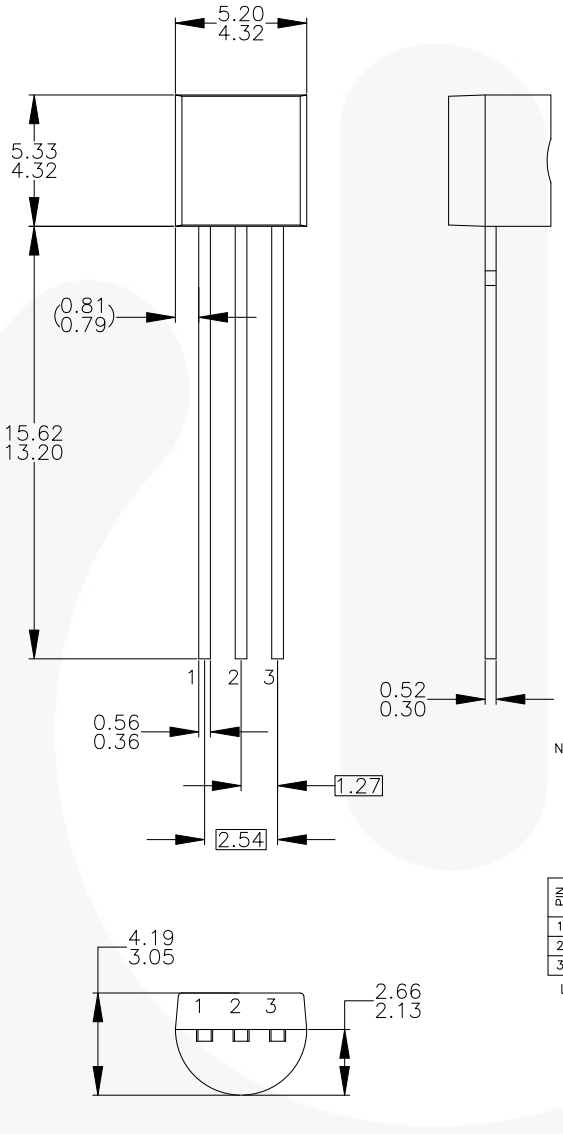


Figure 10. Power Dissipation vs. Ambient Temperature

Physical Dimensions

TO-92



NOTES: UNLESS OTHERWISE SPECIFIED

A) DRAWING WITH REFERENCE TO JEDEC TO-92 RECOMMENDATIONS.
B) ALL DIMENSIONS ARE IN MILLIMETERS.
C) DRAWING CONFORMS TO ASME Y14.5M-1994.
D) TO-92 (92,94,96,97,98) PIN CONFIGURATION:

PIN	92			94			96			97			98		
	P	F	M	P	F	M	B	F	M	P	F	M	P	F	M
1	E	S	S	E	S	S	B	D	G	C	G	D	C	G	D
2	B	D	G	C	G	D	E	S	S	B	D	G	E	S	S
3	C	G	D	B	D	G	C	G	D	E	S	S	B	D	G

LEGEND:
P – BIPOLAR
F – JFET
M – DMOS
E – EMITTER
B – BASE
C – COLLECTOR
D – DRAIN
S – SOURCE
G – GATE

E) FOR PACKAGE 92, 94, 96, 97 AND 98: PIN CONFIGURATION DRAIN "D" AND SOURCE "S" ARE INTERCHANGEAGLE AT JFET "F" OPTION.
F) DRAWING FILENAME: MKT-ZA03DREV3.

Figure 11. 3-LEAD, TO-92, MOLDED, STD STRAIGHT LD (NO EOL CODE)

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Rev. I66

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