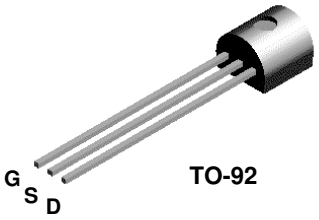
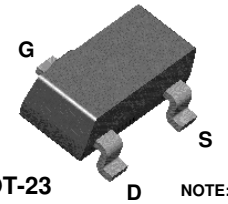
FAIRCHILD
SEMICONDUCTOR TM

2N5457
2N5458
2N5459

MMBF5457
MMBF5458
MMBF5459



TO-92



SOT-23
Mark: 6D / 61S / 6L

NOTE: Source & Drain are interchangeable

N-Channel General Purpose Amplifier

This device is a low level audio amplifier and switching transistors, and can be used for analog switching applications. Sourced from Process 55.

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
		2N5457-5459	*MMBF5457-5459	
P_D	Total Device Dissipation Derate above 25°C	625 5.0	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	556	°C/W

*Device mounted on FR-4 PCB 1.6" X 1.6" X 0.06."

N-Channel General Purpose Amplifier
(continued)

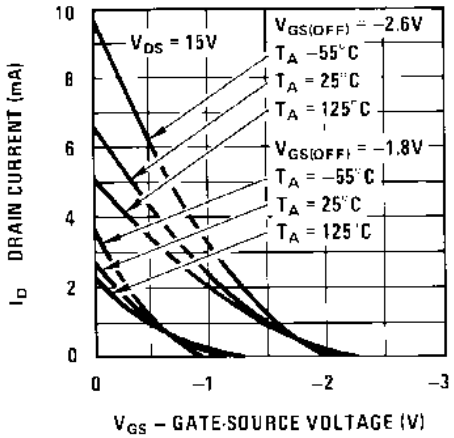
Electrical Characteristics
TA = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions		Min	Typ	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				- 1.0	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	**5457**	- 0.5		- 6.0	V
			5458	- 1.0		- 7.0	V
			5459	- 2.0		- 8.0	V
V_{GS}	Gate-Source Voltage	V_{DS} = 15 V, I_D = 100 μA	**5457**		- 2.5		V
		V_{DS} = 15 V, I_D = 200 μA	**5458**		- 3.5		V
		V_{DS} = 15 V, I_D = 400 μA	**5459**		- 4.5		V
ON CHARACTERISTICS							
I_{DSS}	Zero-Gate Voltage Drain Current*	V_{DS} = 15 V, V_{GS} = 0	**5457**	1.0	3.0	5.0	mA
			5458	2.0	6.0	9.0	mA
			5459	4.0	9.0	16	mA
SMALL SIGNAL CHARACTERISTICS							
g_{fs}	Forward Transfer Conductance*	V_{DS} = 15 V, V_{GS} = 0, f = 1.0 kHz					
			5457	1000		5000	μmhos
			5458	1500		5500	μmhos
			5459	2000		6000	μmhos
g_{os}	Output Conductance*	V_{DS} = 15 V, V_{GS} = 0, f = 1.0 kHz			10	50	μmhos
C_{iss}	Input Capacitance	V_{DS} = 15 V, V_{GS} = 0, f = 1.0 MHz			4.5	7.0	pF
C_{rss}	Reverse Transfer Capacitance	V_{DS} = 15 V, V_{GS} = 0, f = 1.0 MHz			1.5	3.0	pF
NF	Noise Figure	V_{DS} = 15 V, V_{GS} = 0, f = 1.0 kHz, R_G = 1.0 megohm, BW = 1.0 Hz				3.0	dB

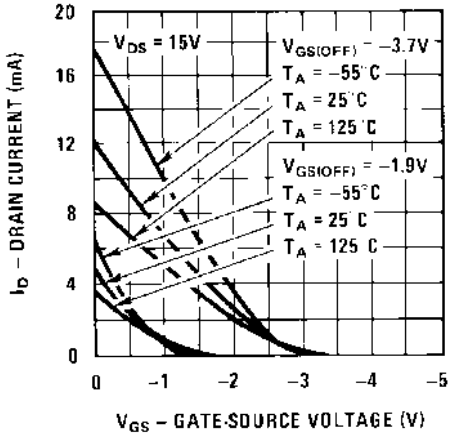
*Pulse Test: Pulse Width ≤ 300 ms, Duty Cycle ≤ 2%

Typical Characteristics

Transfer Characteristics

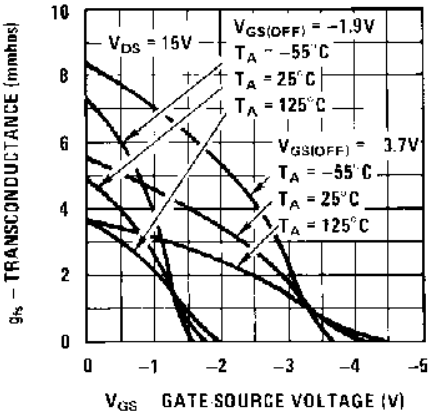


Transfer Characteristics

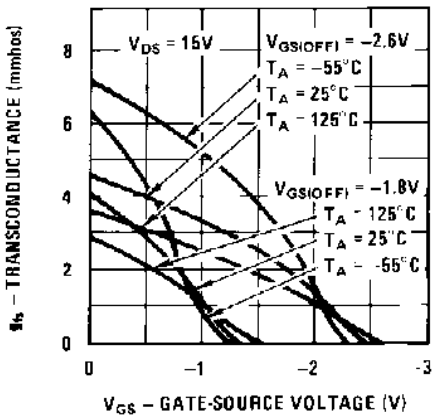


Typical Characteristics (continued)

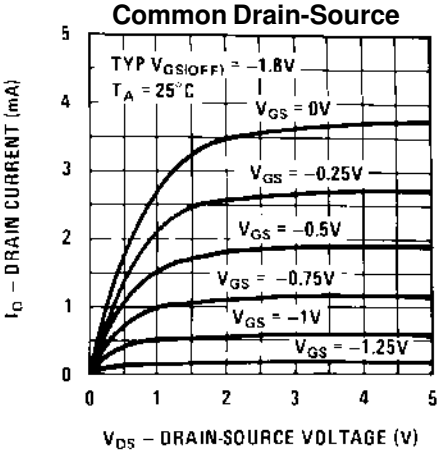
Transfer Characteristics



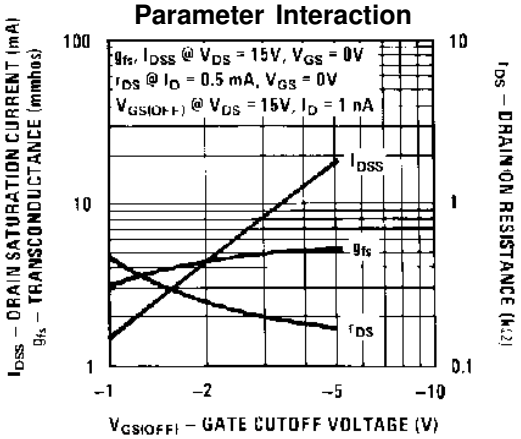
Transfer Characteristics



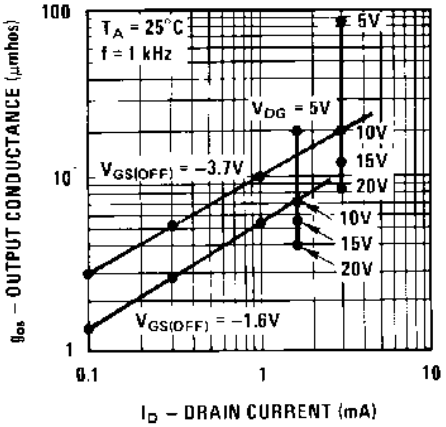
Common Drain-Source



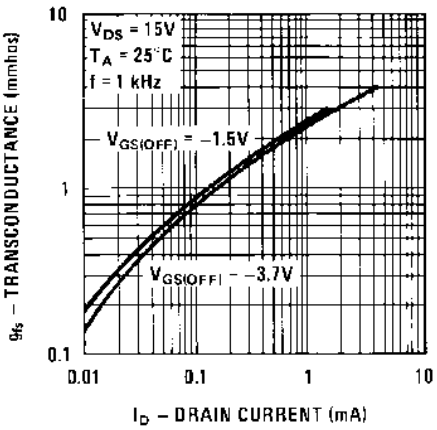
Parameter Interaction



Output Conductance vs. Drain Current

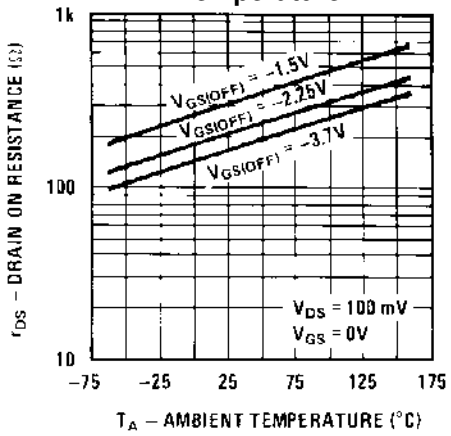


Transconductance vs. Drain Current

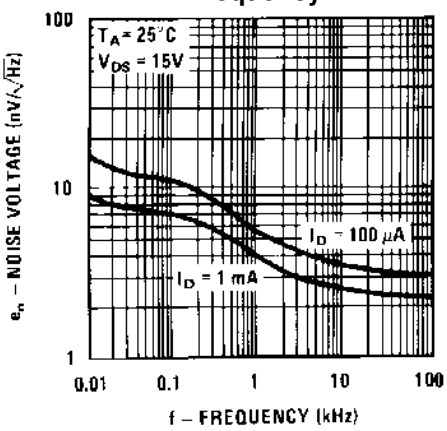


Typical Characteristics (continued)

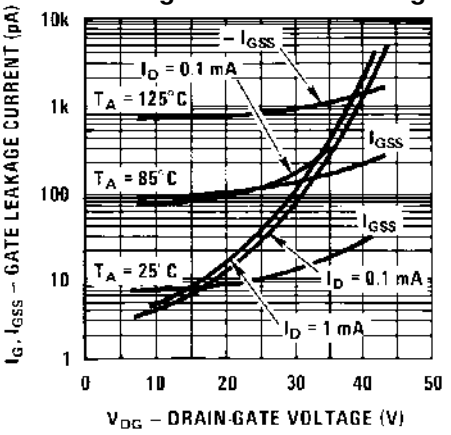
Channel Resistance vs. Temperature



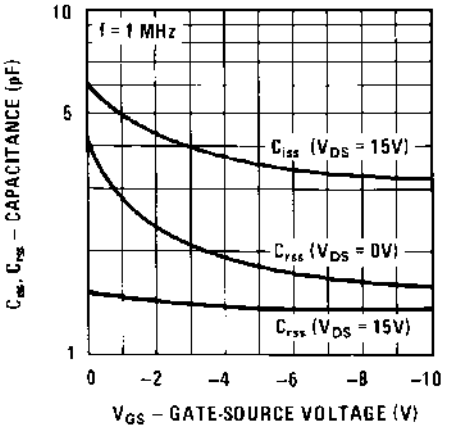
Noise Voltage vs. Frequency



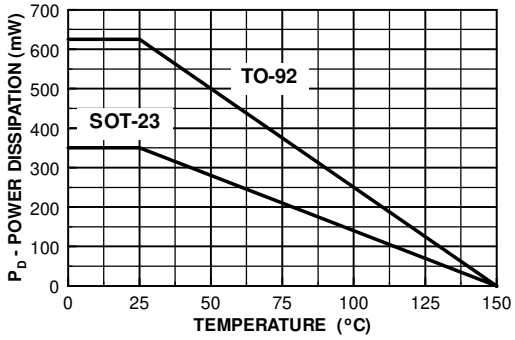
Leakage Current vs. Voltage



Capacitance vs. Voltage



Power Dissipation vs Ambient Temperature



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