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FAIRCHILD
 SEMICONDUCTOR™

*Discrete POWER & Signal
 Technologies*

**2N5457
 2N5458
 2N5459**

**MMBF5457
 MMBF5458
 MMBF5459**



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	*MMBF5457	
P _D	Total Device Dissipation	625	350	mW
	Derate above 25°C	5.0	2.8	mW/°C
R _{θJC}	Thermal Resistance, Junction to Case	83.3		°C/W
R _{θJA}	Thermal Resistance, Junction to Ambient	200	357	°C/W

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

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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	$I_G = 10 \mu A, V_{DS} = 0$	-25			V
I_{GSS}	Gate Reverse Current	$V_{GS} = -15 V, V_{DS} = 0$			-1.0	nA
		$V_{GS} = -15 V, V_{DS} = 0, T_A = 100^\circ C$			-200	nA
$V_{GS(off)}$	Gate-Source Cutoff Voltage	$V_{DS} = 15 V, I_D = 10 nA$				
		2N5457	-0.5		-6.0	V
		2N5458	-1.0		-7.0	V
		2N5459	-2.0		-8.0	V
V_{GS}	Gate-Source Voltage	$V_{DS} = 15 V, I_D = 100 \mu A$			-2.5	V
		$V_{DS} = 15 V, I_D = 200 \mu A$			-3.5	V
		$V_{DS} = 15 V, I_D = 400 \mu A$			-4.5	V

ON CHARACTERISTICS

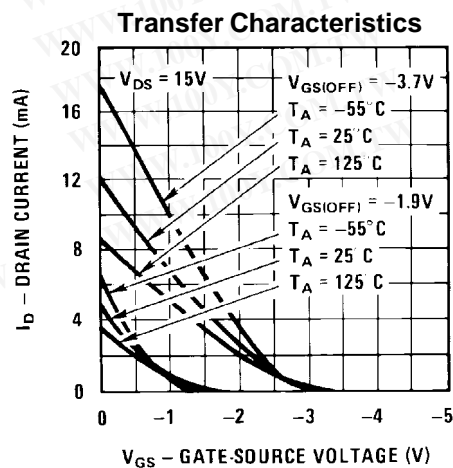
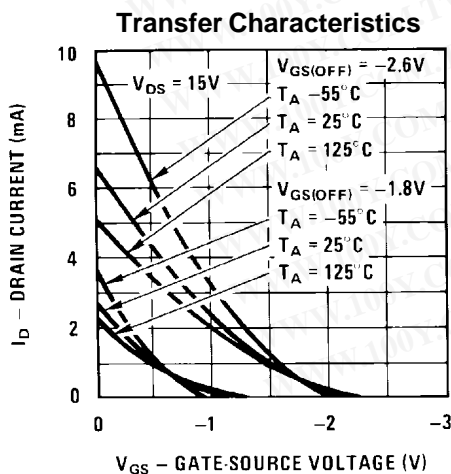
I_{DSS}	Zero-Gate Voltage Drain Current*	$V_{DS} = 15 V, V_{GS} = 0$	2N5457	1.0	3.0	5.0	mA
			2N5458	2.0	6.0	9.0	mA
			2N5459	4.0	9.0	16	mA

SMALL SIGNAL CHARACTERISTICS

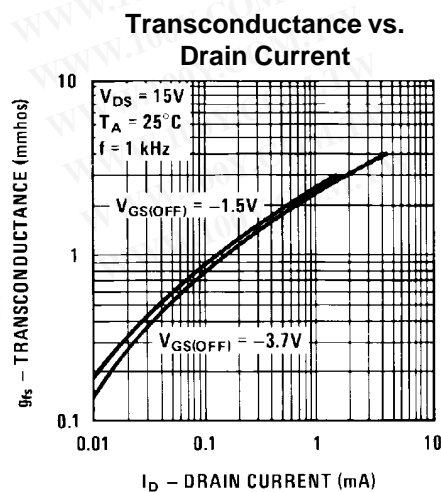
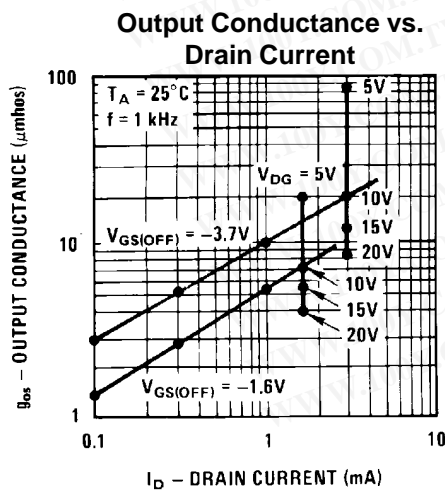
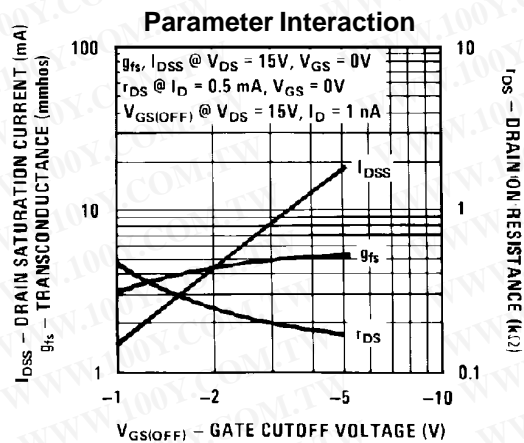
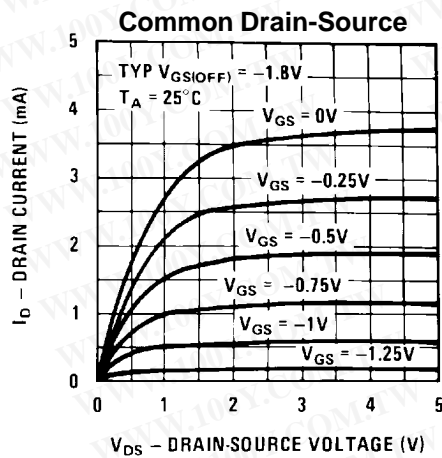
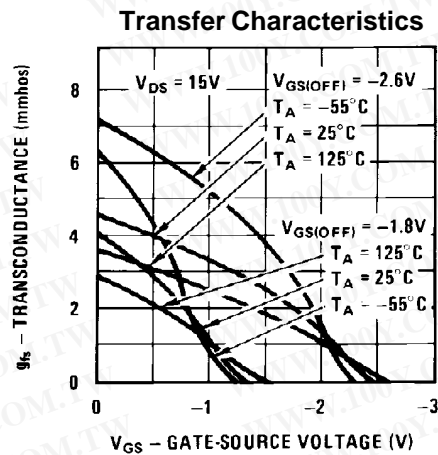
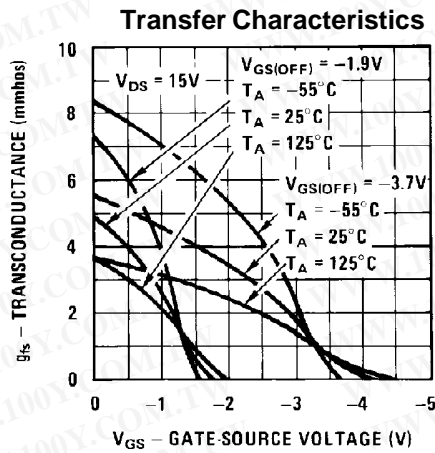
g_{fs}	Forward Transfer Conductance*	$V_{DS} = 15 V, V_{GS} = 0, f = 1.0 kHz$	2N5457	1000		5000	$\mu mhos$
			2N5458	1500		5500	$\mu mhos$
			2N5459	2000		6000	$\mu mhos$
g_{os}	Output Conductance*	$V_{DS} = 15 V, V_{GS} = 0, f = 1.0 kHz$		10	50		$\mu mhos$
C_{iss}	Input Capacitance	$V_{DS} = 15 V, V_{GS} = 0, f = 1.0 MHz$		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 $\leq 300 ms$, Duty Cycle $\leq 2\%$

Typical Characteristics



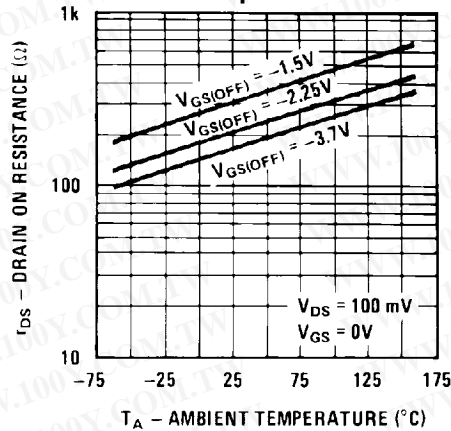
Typical Characteristics (continued)



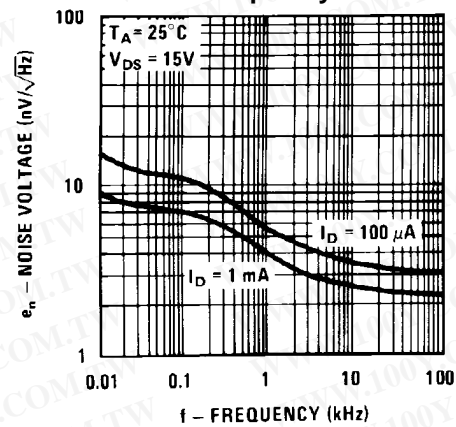
N-Channel General Purpose Amplifier (continued)

Typical Characteristics (continued)

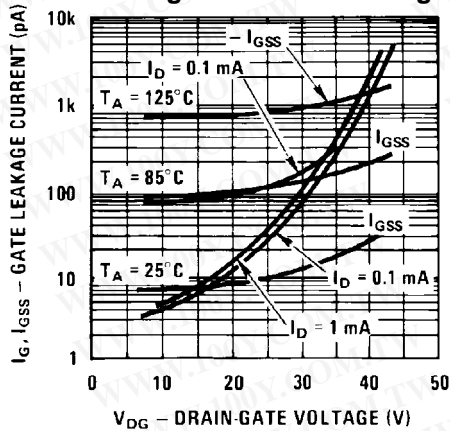
Channel Resistance vs. Temperature



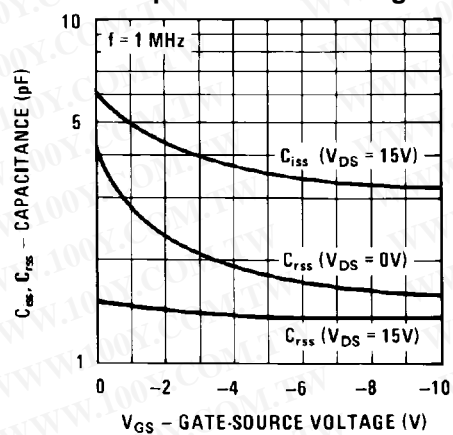
Noise Voltage vs. Frequency



Leakage Current vs. Voltage



Capacitance vs. Voltage



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