N

Discrete POWER & Signal
Technologies

J108
J109
J110

TO-92

G
S
D
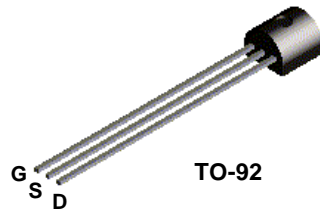
N-Channel Switch

This device is designed for analog or digital switching applications where
very low on resistance is mandatory. Sourced from Process 58.

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
		J108 / J109 / J110	
P_D	Total Device Dissipation	350	mW
	Derate above 25°C	2.8	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	$I_G = -10\ \mu A$, $V_{DS} = 0$		- 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	$V_{DS} = 15\ V$, $I_D = 10\ nA$	**J108**	- 3.0	- 10	V
			J109	- 2.0	- 6.0	V
			J110	- 0.5	- 4.0	V
ON CHARACTERISTICS						
I_{DSS}	Zero-Gate Voltage Drain Current*	$V_{DS} = 15\ V$, $I_{GS} = 0$	**J108**	80		mA
			J109	40		mA
			J110	10		mA
$r_{DS(on)}$	Drain-Source On Resistance	$V_{DS} \leq 0.1\ V$, $V_{GS} = 0$	**J108**		8.0	Ω
			J109		12	Ω
			J110		18	Ω
SMALL SIGNAL CHARACTERISTICS						
$C_{dg(on)}$ $C_{sg(off)}$	Drain Gate & Source Gate On Capacitance	$V_{DS} = 0$, $V_{GS} = 0$, $f = 1.0\ MHz$			85	pF
$C_{dg(off)}$	Drain-Gate Off Capacitance	$V_{DS} = 0$, $V_{GS} = -10\ V$, $f = 1.0\ MHz$			15	pF
$C_{sg(off)}$	Source-Gate Off Capacitance	$V_{DS} = 0$, $V_{GS} = -10\ V$, $f = 1.0\ MHz$			15	pF

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

Typical Characteristics

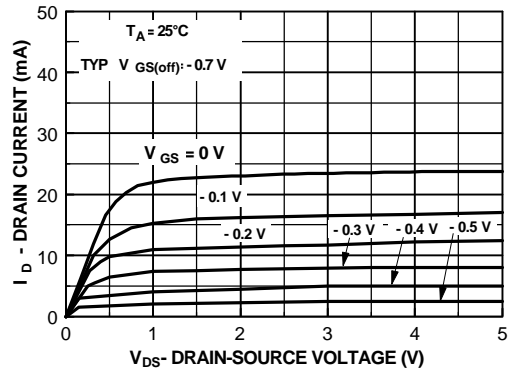### Common Drain-Source

Parameter Interactions
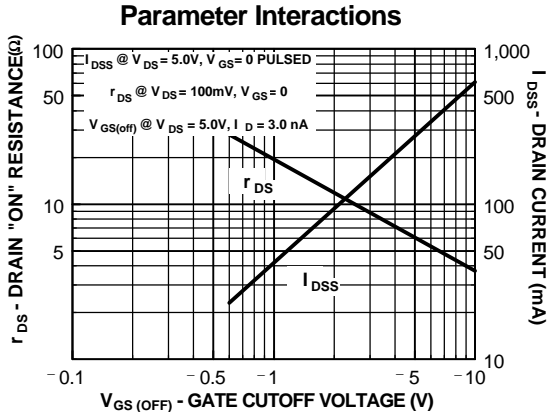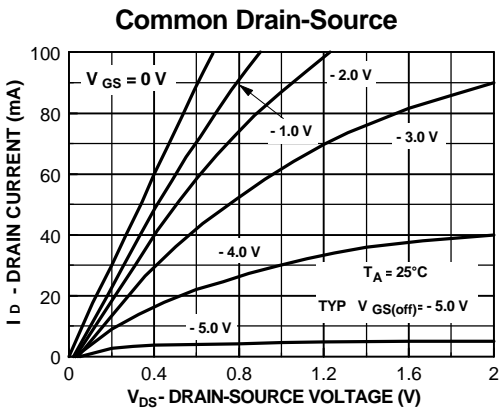
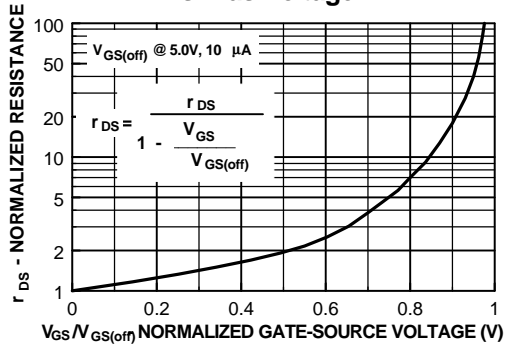## Typical Characteristics   (continued)
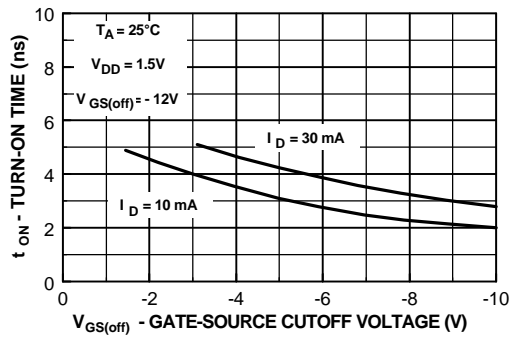
Common Drain-Source
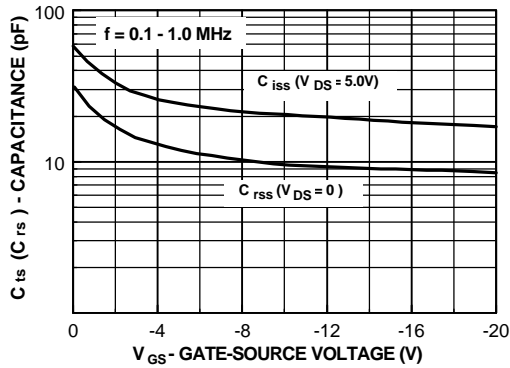
Common Drain-Source

Normalized Drain Resistance vs Bias Voltage

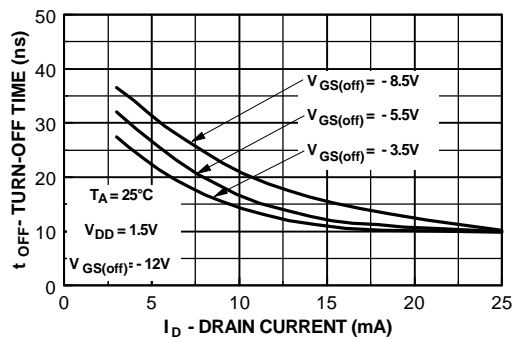$$r_{DS} = \frac{r_{DS}}{1 - \dfrac{V_{GS}}{V_{GS(off)}}}$$

Noise Voltage vs Frequency
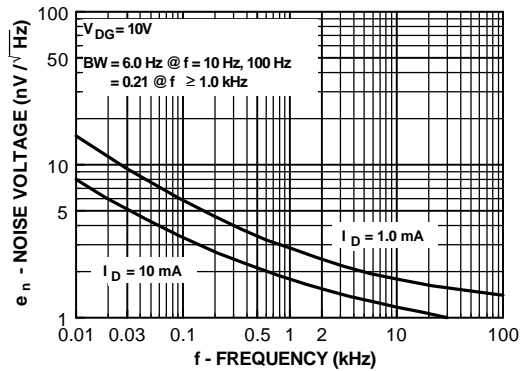
Switching Turn-On Time vs Gate-Source Cutoff Voltage

Switching Turn-On Time vs Drain Current

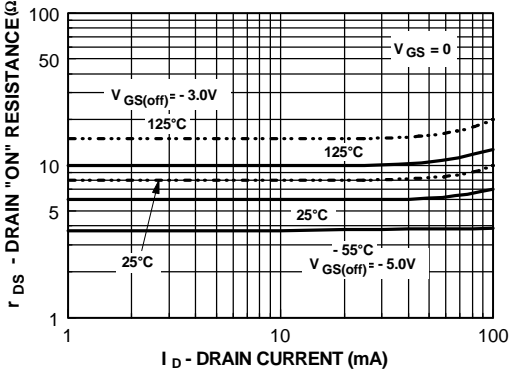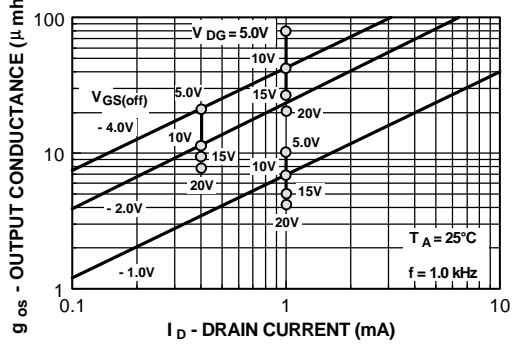## Typical Characteristics   (continued)

On Resistance vs Drain Current

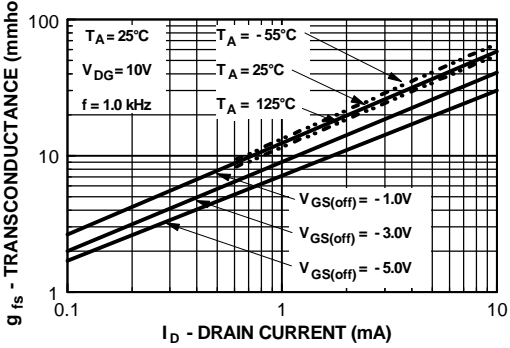### Output Conductance vs Drain Current

Transconductance vs Drain Current

Power Dissipation vs Ambient Temperature