

U290, U291

N-Channel Silicon Junction Field-Effect Transistor

- Choppers
- Low On Resistance Switches

Absolute maximum ratings at $T_A = 25^\circ\text{C}$

Reverse Gate Source & Reverse Gate Drain Voltage

– 30 V

Continuous Forward Gate Current

100 mA

Continuous Device Power Dissipation

500 mW

Power Derating

4 mW/°C

At 25°C free air temperature:

Static Electrical Characteristics

		U290		U291		Process NJ1800D		
		Min	Max	Min	Max	Unit	Test Conditions	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 30		– 30		V	$I_G = -1\ \mu\text{A}$, $V_{DS} = \emptyset\text{V}$	
Gate Reverse Current	I_{GSS}		– 1		– 1	nA	$V_{GS} = -15\text{V}$, $V_{DS} = \emptyset\text{A}$	
			– 1		– 1	μA	$V_{GS} = -15\text{V}$, $V_{DS} = \emptyset\text{A}$	$T_A = 150^\circ\text{C}$
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 4	– 10	– 1.5	– 4.5	V	$V_{DS} = 15\text{V}$, $I_D = 3\text{ nA}$	
Drain Saturation Current (Pulsed)	I_{DSS}	500		200		mA	$V_{DS} = 10\text{V}$, $V_{GS} = \emptyset\text{V}$	
Drain Cutoff Current	$I_{D(OFF)}$		1		1	nA	$V_{DS} = 5\text{V}$, $V_{GS} = -10\text{V}$	
			1		1	μA	$V_{DS} = 5\text{V}$, $V_{GS} = -10\text{V}$	$T_A = 150^\circ\text{C}$
Drain Source ON Voltage	$V_{DS(ON)}$		30		70	mV	$V_{GS} = \emptyset\text{V}$, $I_D = 10\text{ mA}$	
Static Drain Source ON Resistance	$r_{DS(ON)}$	1	3	2	7	Ω	$V_{GS} = \emptyset\text{V}$, $I_D = 10\text{ mA}$	

Dynamic Electrical Characteristics

Drain Source ON Resistance	$r_{ds(on)}$	1	3	2	7	Ω	$V_{GS} = \emptyset\text{V}$, $I_D = \emptyset$	$f = 1\text{ kHz}$
Drain Gate OFF Capacitance	C_{dgo}		30		30	pF	$V_{DG} = 15\text{V}$, $I_S = \emptyset\text{V}$	$f = 1\text{ MHz}$
Source Gate OFF Capacitance	C_{sgo}		30		30	pF	$V_{DG} = 15\text{V}$, $I_S = \emptyset\text{V}$	$f = 1\text{ MHz}$
Source Gate Plus Drain Gate	C_{iss}		160		160	pF	$V_{DG} = \emptyset\text{V}$, $V_{GS} = \emptyset\text{V}$	$f = 1\text{ MHz}$

Switching Characteristics

Turn ON Delay Time	$t_{d(on)}$		15		15	ns	$V_{DD} = 1.5\text{V}$, $I_{D(ON)} = 30\text{ mA}$ $R_L = 50\Omega$ $V_{GS(ON)} = \emptyset\text{V}$ (U290) $V_{GS(OFF)} = -12\text{V}$ (U291) $V_{GS(OFF)} = -7\text{V}$
Rise Time	t_r		20		20	ns	
Turn OFF Delay Time	$t_{d(off)}$		15		15	ns	
Fall Time	t_f		20		20	ns	

TO-52 Package

Dimensions in Inches (mm)

Pin Configuration

1 Source, 2 Drain, 3 Gate & Case

