

## P-Channel 20V(D-S) MOSFET

Product summary		
$V_{DS}$	-20	V
$R_{DS(ON)}$ (at $V_{GS}=-4.5V$ ) Typ.	90	m $\Omega$
$R_{DS(ON)}$ (at $V_{GS}=-2.5V$ ) Typ.	120	m $\Omega$
$I_D$ ( $T_A=25^\circ C$ )	-2.0	A

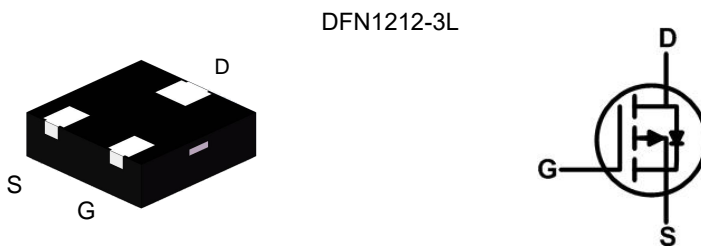
### Features

- Operated at Low Logic Level Gate Drive
- Low  $R_{DS(on)}$

### Applications

- Load Switching
- Logic Level Shift

### Pin Configuration



### Packing Information

Device	Package	Reel Size	Quantity(Min. Package)
ECAJ2201	DFN1212-3L	7"	3000pcs

### Absolute Maximum Ratings (at $T_A=25^\circ C$ Unless Otherwise Noted)

Symbol	Parameter	Rating	Units	
$V_{DS}$	Drain-Source Voltage	-20	V	
$V_{GS}$	Gate-Source Voltage	$\pm 12$	V	
$I_D$	Continuous Drain Current <sup>A</sup>	$T_A=25^\circ C$	-2.0	A
		$T_A=70^\circ C$	-1.6	A
$I_{DM}$	Pulse Drain Current Tested <sup>B</sup>	-8.0	A	
$P_D$	Power Dissipation <sup>A</sup>	$T_A=25^\circ C$	0.8	W
$T_J, T_{STG}$	Junction and Storage Temperature Range	-55 to +150	$^\circ C$	

### Thermal Characteristics

Symbol	Parameter	Typical	Units
$R_{\theta JA}$	Thermal Resistance-Junction to ambient <sup>A</sup>	156	$^\circ C/W$

**Electrical Characteristics (at  $T_J = 25^\circ\text{C}$  Unless Otherwise Noted)**

Symbol	Parameter	Condition	Min.	Typ.	Max.	Units
<b>Static Parameters</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-20	--	--	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=-20V, V_{GS}=0V$	--	--	-1	$\mu A$
$I_{GSS}$	Gate-Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 12V$	--	--	$\pm 100$	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.4	-0.7	-1.0	V
$R_{DS(on)}$	Drain-Source On-State Resistance <sup>B</sup>	$V_{GS}=-4.5V, I_D=-1.2A$	--	90	125	m $\Omega$
		$V_{GS}=-2.5V, I_D=-1.0A$	--	120	160	m $\Omega$
$V_{SD}$	Forward Voltage	$I_{SD}=-1.2A, V_{GS}=0V$	--	--	1.2	V
<b>Dynamic Parameters <sup>C</sup></b>						
$C_{iss}$	Input Capacitance	$V_{GS}=0V, V_{DS}=-10V$ $f=1\text{MHZ}$	--	288	--	pF
$C_{oss}$	Output Capacitance		--	47	--	pF
$C_{rss}$	Reverse Transfer Capacitance		--	28	--	pF
$Q_g$	Total Gate Charge	$V_{DS}=-10V, I_D=-2A$ $V_{GS}=-4.5V$	--	3.8	--	nC
$Q_{gs}$	Gate-Source Charge		--	0.7	--	nC
$Q_{gd}$	Gate-Drain Charge		--	0.9	--	nC
$t_{D(on)}$	Turn-on Delay Time	$V_{DD}=-10V$ $I_D=-1A,$ $R_{GEN}=2.5\Omega,$ $V_{GS}=-4.5V$	--	13	--	nS
$t_r$	Turn-on Rise Time		--	55	--	nS
$t_{D(off)}$	Turn-off Delay Time		--	15	--	nS
$t_f$	Turn-off Fall Time		--	9	--	nS

A. The data tested by surface mounted on a 1 inch x 1 inch FR-4 board with 20Z copper.

B. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty cycle  $\leq 2\%$ .

C. Guaranteed by design, not subject to production testing.

Typical Characteristics

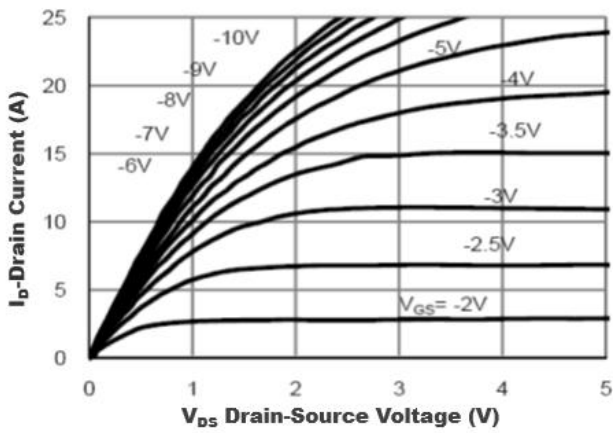


Figure1. Output Characteristics

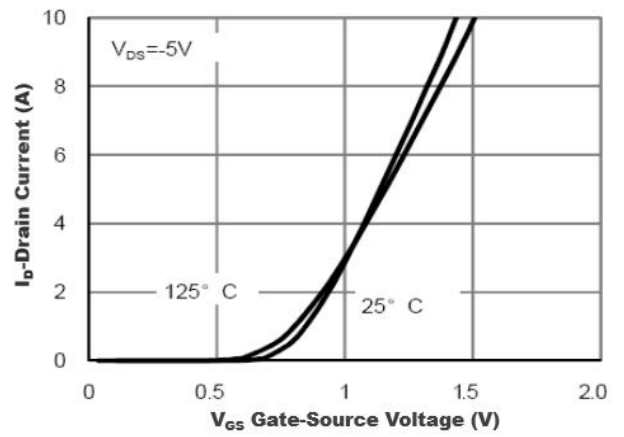


Figure2. Transfer Characteristics

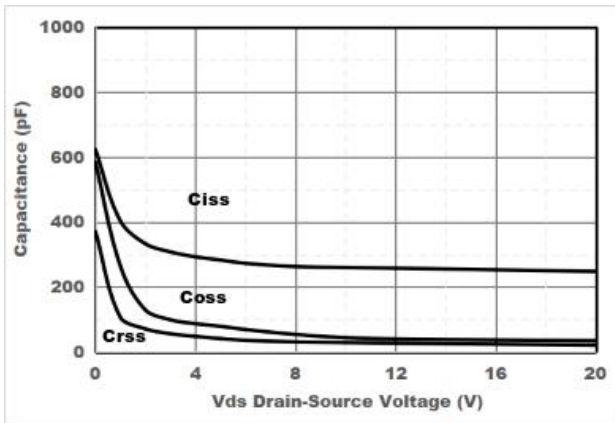


Figure3. Capacitance Characteristics

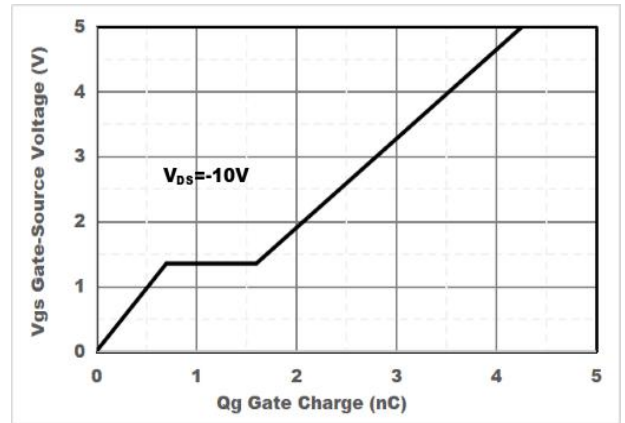


Figure4. Gate Charge

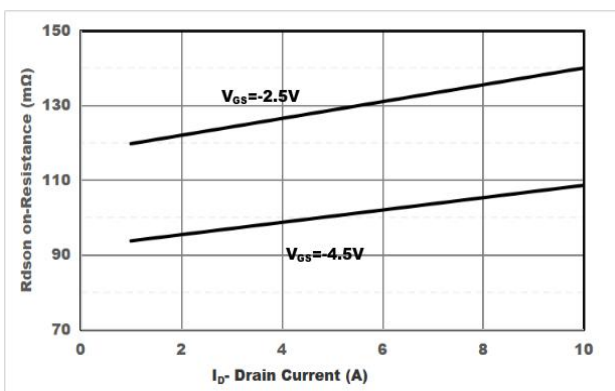


Figure5. Drain-Source on Resistance

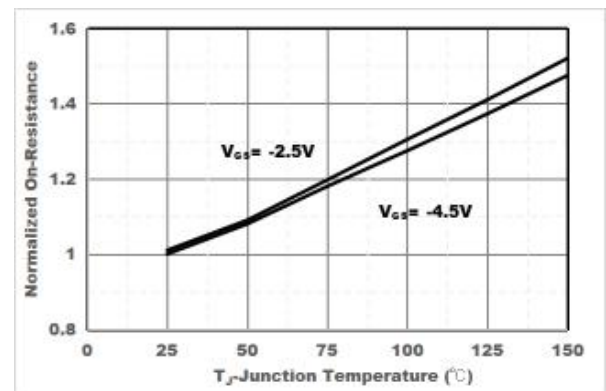


Figure6. Drain-Source on Resistance

Typical Characteristics

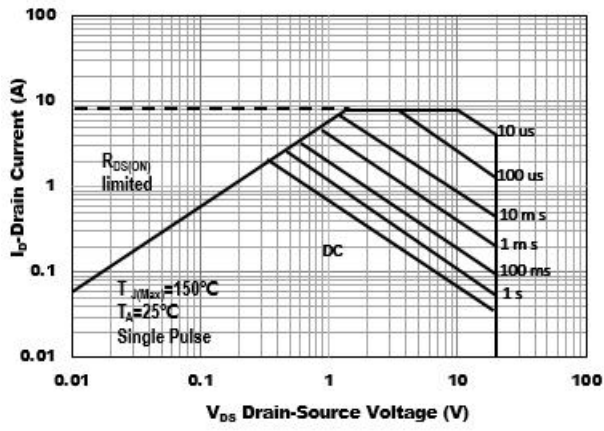


Figure7. Safe Operation Area

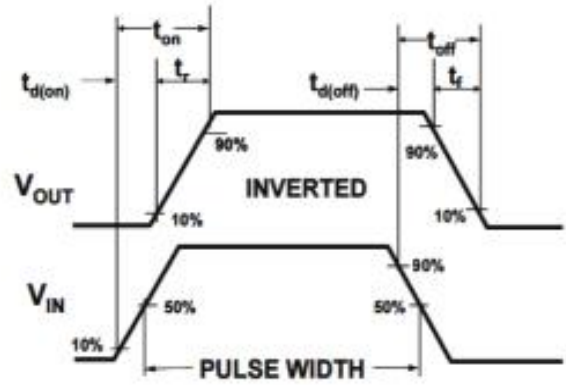
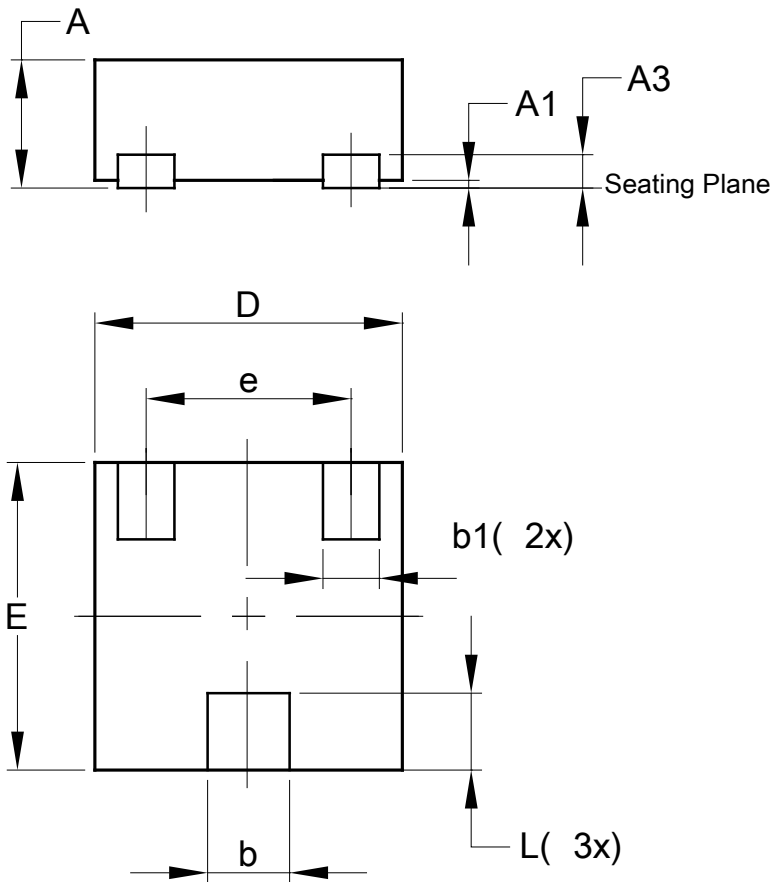


Figure8. Switching wave

## DFN1212-3L Package Information



DFN1212-3			
Dim	Min	Max	Typ
<b>A</b>	0.47	0.53	0.50
<b>A1</b>	0	0.05	0.02
<b>A3</b>	-	-	0.13
<b>b</b>	0.27	0.37	0.32
<b>b1</b>	0.17	0.27	0.22
<b>D</b>	1.15	1.25	1.20
<b>E</b>	1.15	1.25	1.20
<b>e</b>	-	-	0.80
<b>L</b>	0.25	0.35	0.30
<b>All Dimensions in mm</b>			