

## P-Channel 14V(D-S) MOSFET

Product summary		
$V_{DS}$	-14	V
$R_{DS(ON)}$ (at $V_{GS}=-4.5V$ ) Typ.	46	m $\Omega$
$R_{DS(ON)}$ (at $V_{GS}=-2.5V$ ) Typ.	65	m $\Omega$
$I_D$ ( $T_A=25^{\circ}C$ )	-2.1	A

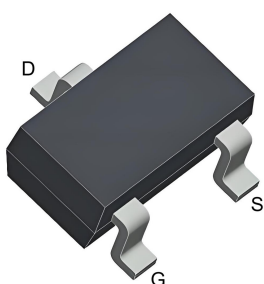
### Features

- Trench Power LV MOSFET technology
- Low Gate Charge

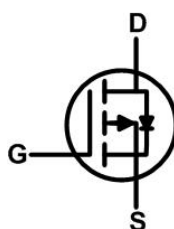
### Applications

- Power management
- Switching Circuits

### Pin Configuration



SOT-323



### Packing Information

Device	Package	Reel Size	Quantity(Min. Package)
ECDF2205	SOT-323	7"	3000pcs

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

Symbol	Parameter		Rating	Units
$V_{DS}$	Drain-Source Voltage		-14	V
$V_{GS}$	Gate-Source Voltage		$\pm 10$	V
$I_D$	Continuous Drain Current at $V_{GS}=-4.5V$	$T_A=25^{\circ}C$	-2.1	A
		$T_A=70^{\circ}C$	-1.7	A
$I_{DM}$	Pulse Drain Current Tested <sup>A</sup>		-11	A
$P_D$	Power Dissipation		0.4	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>B</sup>	312	$^{\circ}C/W$

# 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	$V_{GS}=0V, I_D=-250\mu A$	-14	--	--	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=-12V, V_{GS}=0V$	--	--	-1	$\mu A$
$I_{GSS}$	Gate-Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 9V$	--	--	$\pm 100$	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.4	-0.6	-1.0	V
$R_{DS(on)}$	Drain-Source On-State Resistance <sup>C</sup>	$V_{GS}=-4.5V, I_D=-2A$	--	46	60	m $\Omega$
		$V_{GS}=-2.5V, I_D=-1A$	--	65	90	m $\Omega$
$V_{SD}$	Forward Voltage	$I_{SD}=-1A, V_{GS}=0V$	--	--	-1.3	V
<b>Dynamic Parameters <sup>D</sup></b>						
$C_{iss}$	Input Capacitance	$V_{GS}=0V, V_{DS}=-10V$ $f=1\text{MHz}$	--	140	--	pF
$C_{oss}$	Output Capacitance		--	112	--	pF
$C_{rss}$	Reverse Transfer Capacitance		--	25	--	pF
$Q_g$	Total Gate Charge	$V_{DS}=-6V, I_D=-2A$ $V_{GS}=-4.5V$	--	7	--	nC
$Q_{gs}$	Gate-Source Charge		--	0.9	--	nC
$Q_{gd}$	Gate-Drain Charge		--	1.8	--	nC
$t_{D(on)}$	Turn-on Delay Time	$V_{DD}=-6V$ $I_D=-2A, R_G=3.3\Omega,$ $V_{GS}=-4.5V$	--	10	--	ns
$t_r$	Turn-on Rise Time		--	12	--	ns
$t_{D(off)}$	Turn-off Delay Time		--	27	--	ns
$t_f$	Turn-off Fall Time		--	20	--	ns

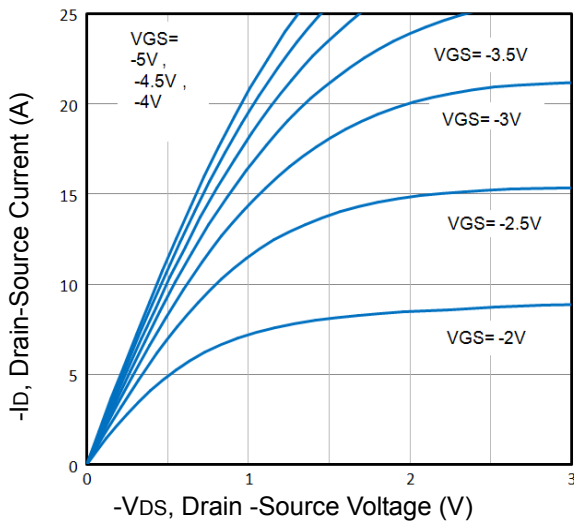
A. Pulse width limited by maximum allowable junction temperature.

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

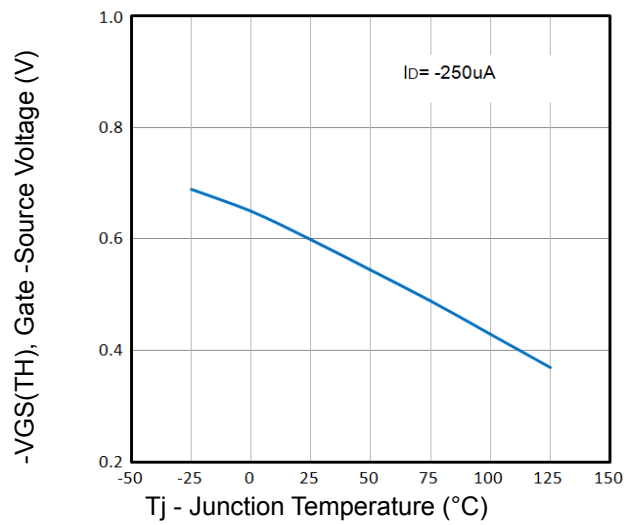
C. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty cycle  $\leq 2\%$ .

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

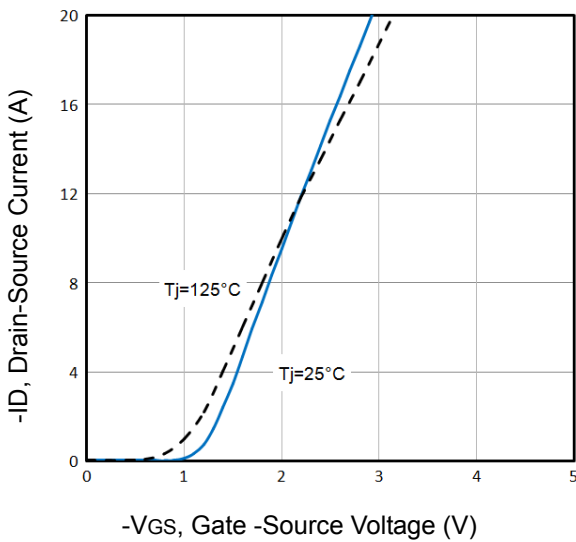
## Typical Characteristics



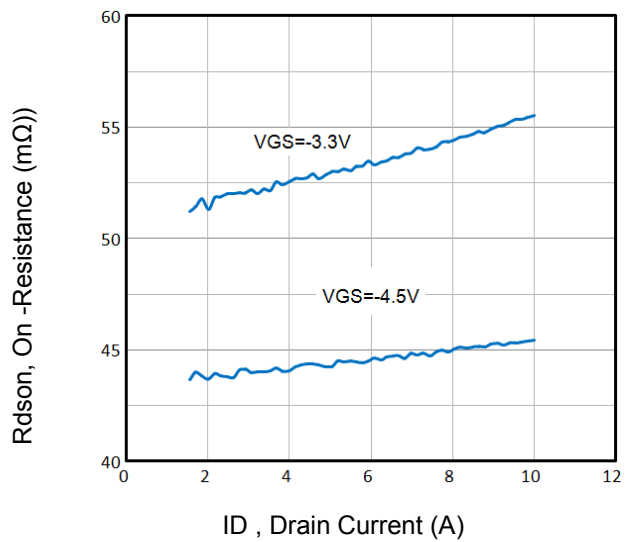
**Fig1.** Typical Output Characteristics



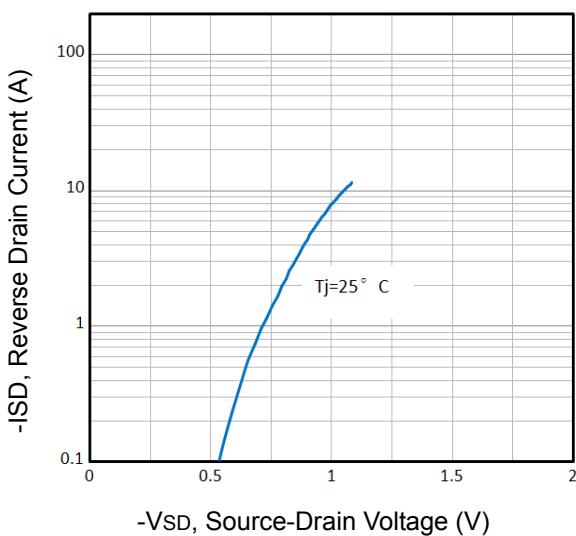
**Fig2.** VGS(TH) Voltage Vs. Temperature



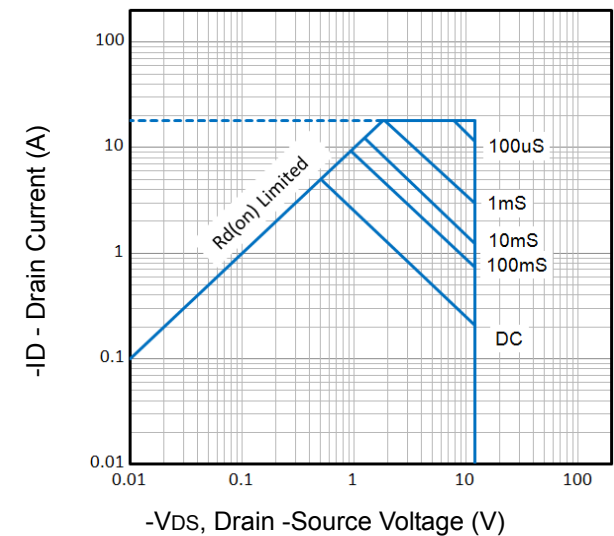
**Fig3.** Typical Transfer Characteristics



**Fig4.** On-Resistance vs. Drain Current and Gate V

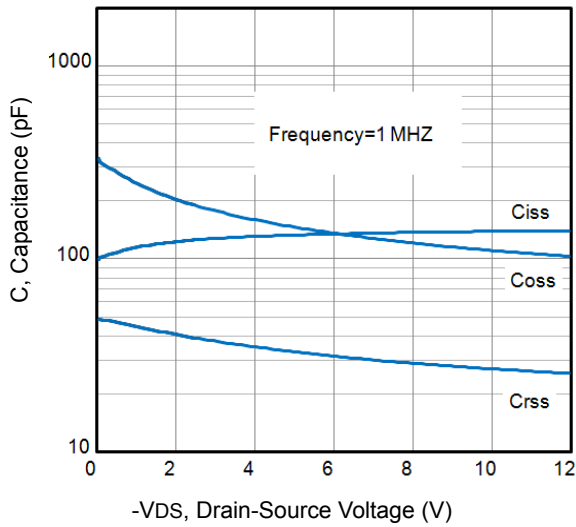


**Fig5.** Typical Source-Drain Diode Forward Voltage

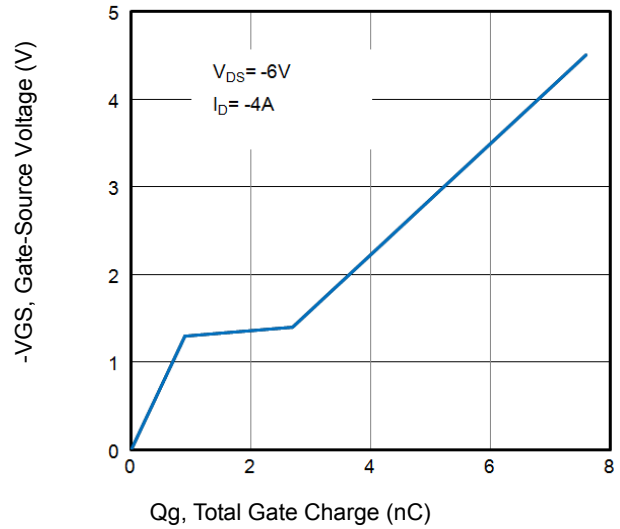


**Fig6.** Maximum Safe Operating Area

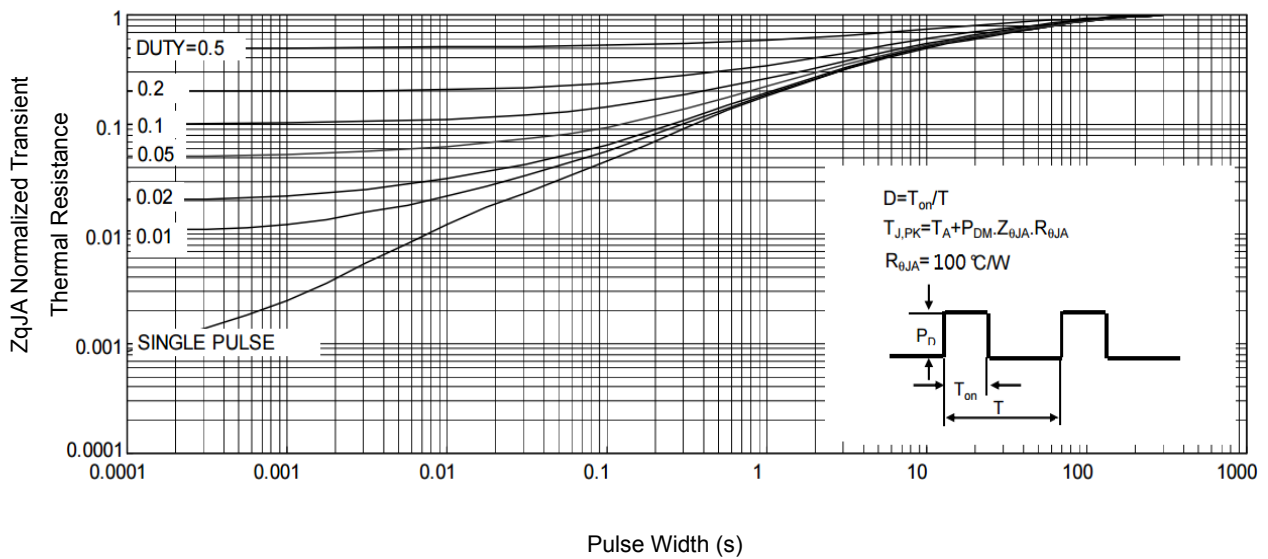
## Typical Characteristics



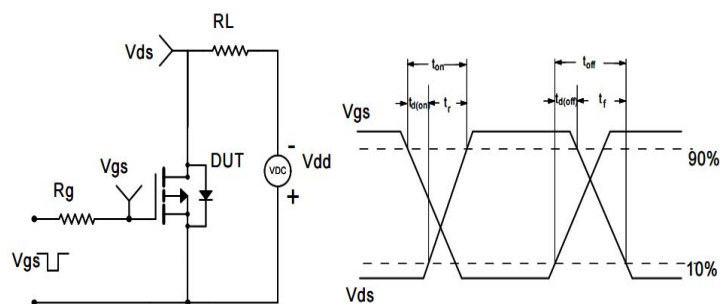
**Fig7.** Typical Capacitance Vs. Drain-Source Voltage



**Fig8.** Typical Gate Charge Vs. Gate-Source Voltage

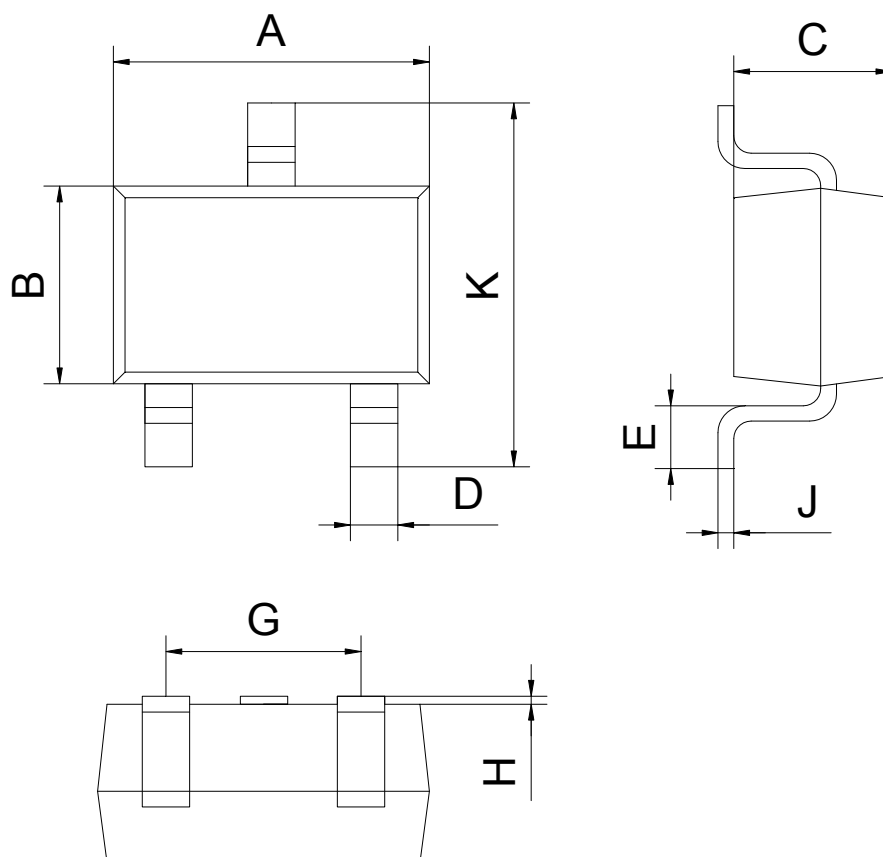


**Fig9.** Normalized Maximum Transient Thermal Impedance



**Fig10.** Switching Time Test Circuit and waveforms

# SOT-323 Package Information



SOT-323		
Dim	Min	Max
A	2.00	2.20
B	1.15	1.35
C	0.90	1.10
D	0.15	0.35
E	0.25	0.40
G	1.20	1.40
H	0.02	0.10
J	0.05	0.15
K	2.20	2.40
All Dimensions in mm		