

## N-Channel 20V(D-S) MOSFET With Schottky Diode

Product summary		
$V_{DS}$	20	V
$R_{DS(ON)}$ (at $V_{GS}=4.5V$ ) Max.	0.35	$\Omega$
$V_R$	20	V
$I_F$	1	A

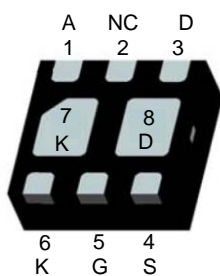
### Features

- Small package DFN2x2-6L
- High DC current gain
- RoHS and Halogen-Free Compliant

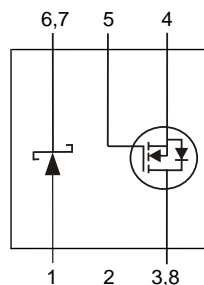
### Applications

- Power management
- Charging Switch

### Pin Configuration



DFN2X2-6L



### Packing Information

Device	Package	Reel Size	Quantity(Min. Package)
EC4516	DFN2X2-6L	7"	3000pcs

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

Symbol	Parameter	Rating	Units
<b>N-MOSFET</b>			
$V_{DS}$	Drain-Source Voltage	20	V
$V_{GS}$	Gate-Source Voltage	$\pm 8$	V
$I_D$	Continuous Drain Current <sup>A</sup>	0.6	A
$I_{DM}$	Pulse Drain Current <sup>B</sup>	1.9	A
<b>Schottky Barrier Diode</b>			
$V_R$	Peak Repetitive Reverse Voltage	20	V
$I_F$	Average Rectified Forward Current	1	A
$I_{FM}$	Pulsed Forward Current	6	A
<b>Power Dissipation, Temperature and Thermal Resistance</b>			
$P_D$	Maximum Power Dissipation <sup>A</sup>	1.1	W
$R_{\theta JA}$	Thermal Resistance-Junction to ambient <sup>A</sup>	114	$^\circ\text{C}/\text{W}$
$T_J, T_{STG}$	Junction and Storage Temperature Range	-55 to +150	$^\circ\text{C}$

**N-Channel 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	$V_{DS}=16V, V_{GS}=0V$	--	--	1	$\mu A$
$I_{GSS}$	Gate-Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 8V$	--	--	$\pm 10$	$\mu A$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	0.5	0.71	1.0	V
$R_{DS(on)}$	Drain-Source On-State Resistance <sup>B</sup>	$V_{GS}=4.5V, I_D=0.5A$	--	--	0.35	$\Omega$
		$V_{GS}=2.5V, I_D=0.5A$	--	--	0.55	$\Omega$
$V_{SD}$	Diode Forward Voltage	$I_S=0.5A, V_{GS}=0V$	--	0.7	1.3	V
<b>Dynamic Parameters <sup>C</sup></b>						
$C_{iss}$	Input Capacitance	$V_{GS}=0V, V_{DS}=10V$ $f=1MHz$	--	67	--	pF
$C_{oss}$	Output Capacitance		--	18	--	pF
$C_{rss}$	Reverse Transfer Capacitance		--	6	--	pF
$Q_g$	Total Gate Charge	$V_{DD}=10V, I_D=0.5A$ $V_{GS}=4.5V$	--	1.4	--	nC
$Q_{gs}$	Gate-Source Charge		--	0.21	--	nC
$Q_{gd}$	Gate-Drain Charge		--	0.21	--	nC
$t_{D(on)}$	Turn-on Delay Time	$V_{DD}=10V$ $I_D=0.15A,$ $R_{GEN}=10\Omega,$ $V_{GS}=4V$	--	2.8	--	nS
$t_r$	Turn-on Rise Time		--	20	--	nS
$t_{D(off)}$	Turn-off Delay Time		--	23	--	nS
$t_f$	Turn-off Fall Time		--	24	--	nS

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

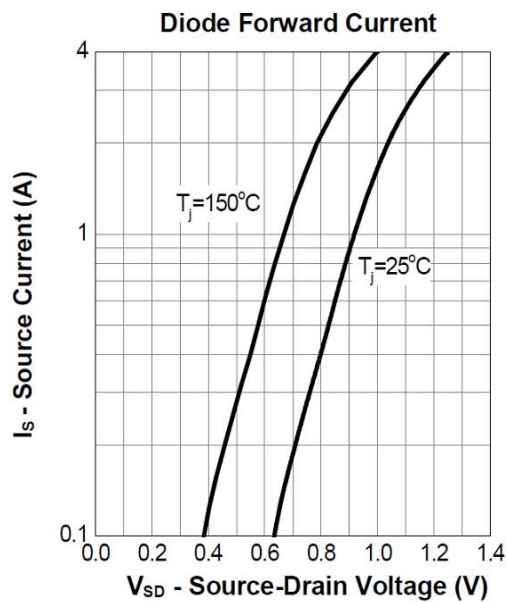
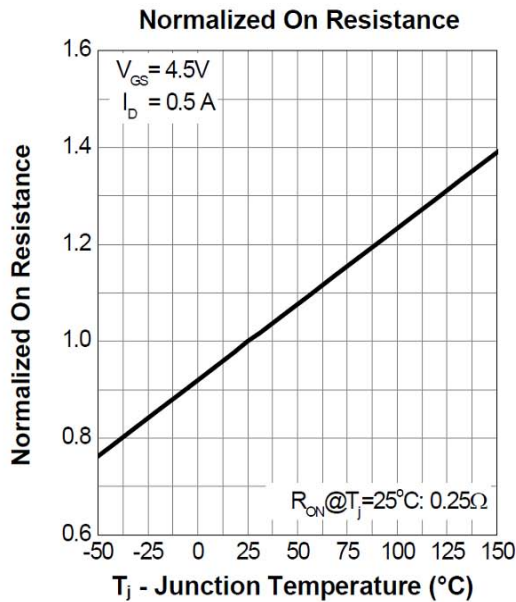
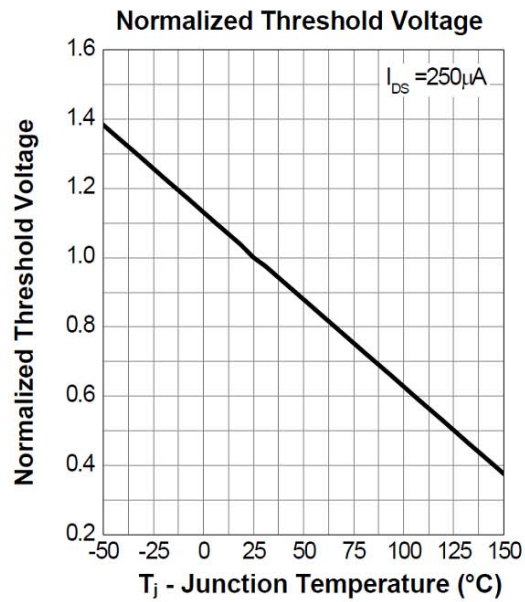
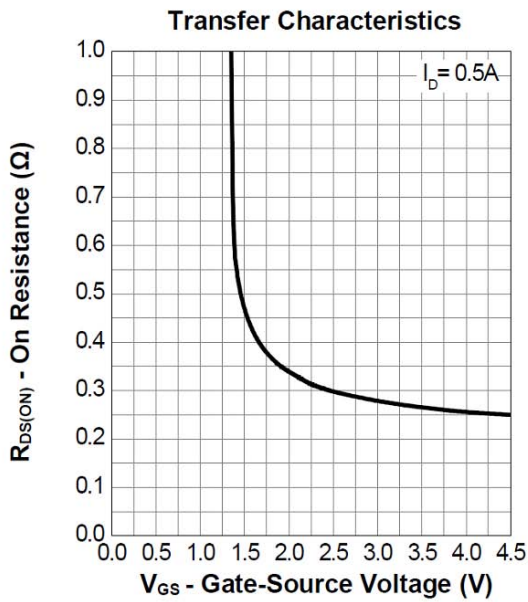
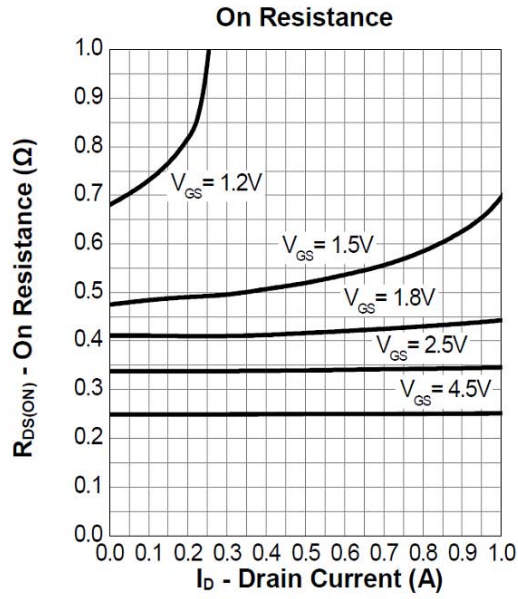
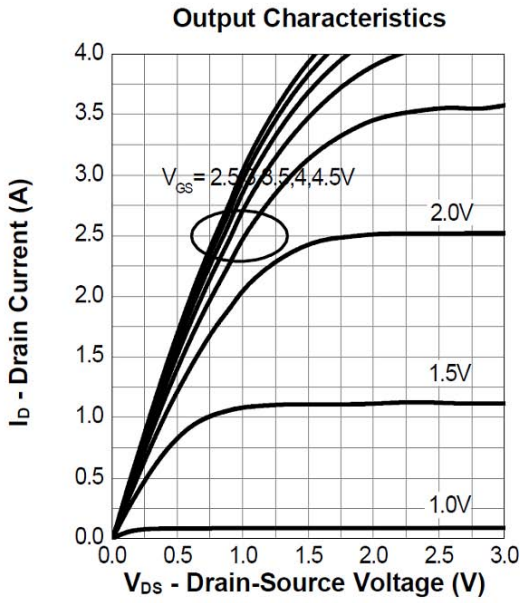
B. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty cycle  $\leq 2\%$ .

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

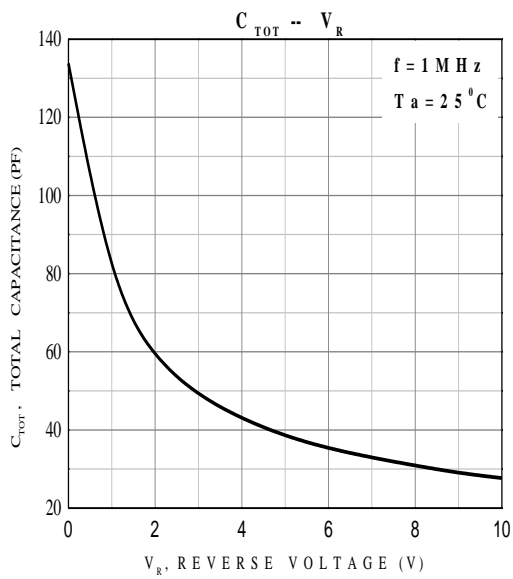
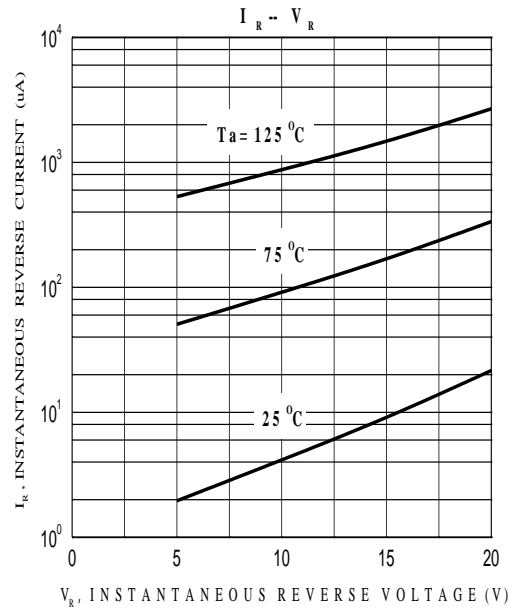
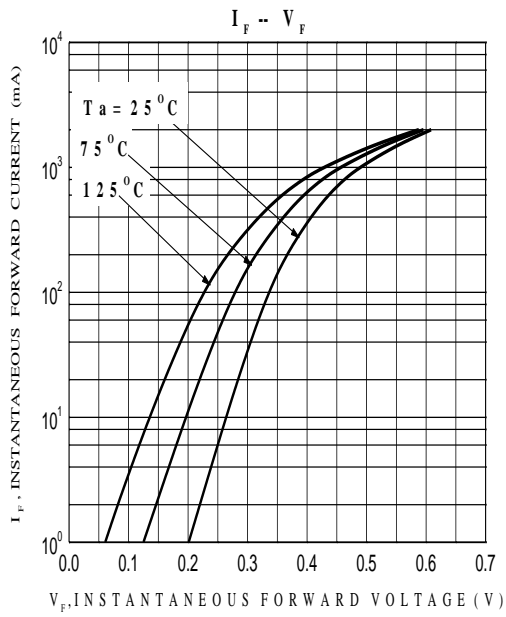
**Schottky Diode Electrical Characteristics (at  $T_J = 25^\circ\text{C}$  Unless Otherwise Noted)**

Symbol	Parameter	Condition	Min.	Typ.	Max.	Units
<b>Static Parameters</b>						
$V_R$	Reverse breakdown voltage	$I_R=1mA$	20	--	--	V
$I_R$	Reverse voltage leakage current	$V_R=20V$	--	--	100	$\mu A$
$V_F$	Forward voltage	$I_F=0.5A$	--	0.42	0.47	V
$C_D$	Diode capacitance	$V_R=10V, f=1MHz$	--	36	--	pF

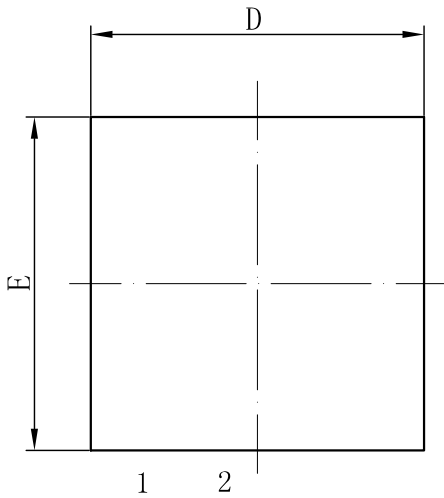
N-Channel MOSFET Typical Characteristics



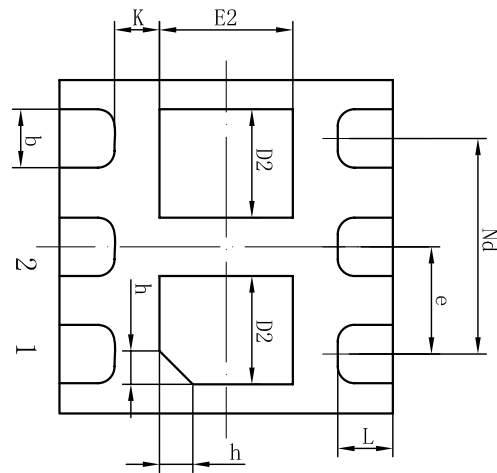
### Schottky Diode Typical Characteristics



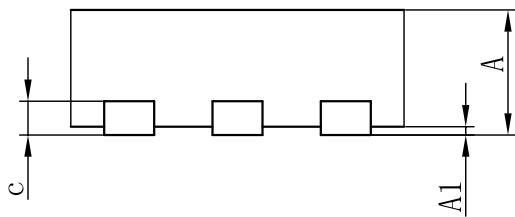
DFN2X2-6L Package Information



Top View



Bottom View



Side View

SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.70	0.75	0.80
A1	0	0.02	0.05
b	0.30	0.35	0.40
c	0.18	0.20	0.25
D	1.95	2.00	2.05
D2	0.60	0.65	0.70
e	0.65BSC		
Nd	1.30BSC		
E	1.95	2.00	2.05
E2	0.75	0.80	0.85
K	0.20	-	-
L	0.28	0.33	0.38
h	0.15	0.20	0.25