

P-Channel 20V (D-S) MOSFET with Schottky Diode

$V_{(BR)DSS}/V_R$	$R_{DS(on)MAX}$	I_D/I_F
-20V	110mΩ@-4.5V	-2.9A
	150mΩ@-2.5V	
	230mΩ@-1.8V	
20V	/	1A

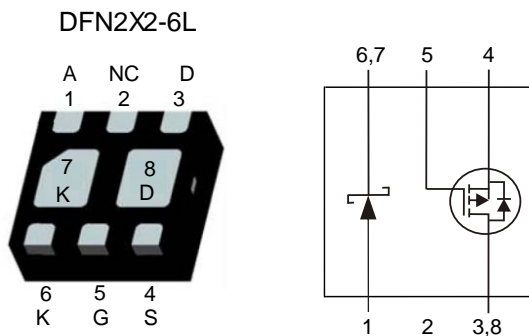
Features

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

Applications

- Charging Switch for Portable Devices
- Power management

Pin Configuration



Packing Information

Device	Marking	Reel Size	Tape Width	Quantity
EC4511	13D .XXX	7"	8mm	3000pcs

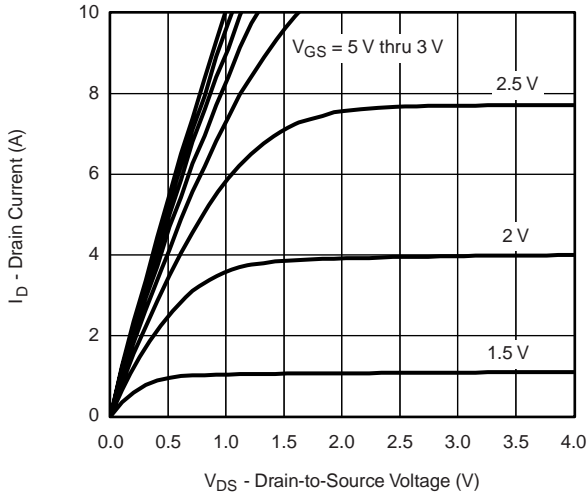
Absolute Maximum Ratings (T_J=25 °C Unless Otherwise Noted)

Symbol	Parameter	Value	Unit
P-MOSFET			
V_{DS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-Source Voltage	±8	V
I_D	Continuous Drain Current	-2.9	A
I_{DM}	Pulse Drain Current	-9	A
Schottky Barrier Diode			
V_B	Peak Repetitive Reverse Voltage	20	V
I_F	Average Rectified Forward Current	1.0	A
I_{FM}	Pulsed Forward Current	6	A
Power Dissipation, Temperature and Thermal Resistance			
P_D	Maximum Power Dissipation	1.1	W
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient	114	°C/W
T_j	Junction Temperature	150	°C
T_{stg}	Storage Temperature	-55~+150	°C
T_L	Lead Temperature for Soldering Purposes(1/8" from case for 10 s)	260	°C

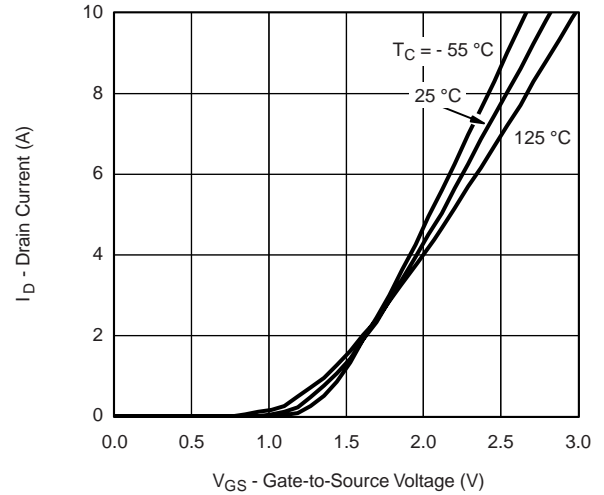
Electrical Characteristics (T_J = 25°C Unless Otherwise Specified)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
P-MOSFET						
STATIC PARAMETERS						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = -250μA	-20	-25		V
Zero gate voltage drain current	I _{DSS}	V _{DS} = -16V, V _{GS} = 0V			-1	μA
Gate-body leakage current	I _{GSS}	V _{GS} = ±8V, V _{DS} = 0V			±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250μA	-0.45	-0.65	-0.9	V
Drain-source on-resistance(note1)	R _{DS(on)}	V _{GS} = -4.5V, I _D = -2.7A			110	mΩ
		V _{GS} = -2.5V, I _D = -2.2A			150	mΩ
		V _{GS} = -1.8V, I _D = -1A			230	mΩ
Forward transconductance(note1)	g _{FS}	V _{DS} = -10V, I _D = -2.7A		7		S
Diode forward voltage(note1)	V _{SD}	I _S = -0.9A, V _{GS} = 0V		-0.8	-1.2	V
DYNAMIC PARAMETERS (note 2)						
Input capacitance	C _{iss}	V _{DS} = -10V, V _{GS} = 0V, f = 1MHz			300	pF
Output capacitance	C _{oss}				150	pF
Reverse transfer capacitance	C _{rss}				50	pF
SWITCHING PARAMETERS (note 2)						
Turn-on delay time	t _{d(on)}	V _{GS} = -4.5V, V _{DD} = -10V, R _L = 10Ω, R _G = 6Ω, I _D = -1A			25	ns
Turn-on rise time	t _r				45	ns
Turn-off delay time	t _{d(off)}				45	ns
Turn-off fall time	t _f				40	ns
Total Gate Charge	Q _g	V _{DS} = -10V, V _{GS} = -4.5V, I _D = -2.7A			7.7	nC
Gate-Source Charge	Q _{gs}			1.3		nC
Gate-Drain Charge	Q _{gd}			0.9		nC
SCHOTTKY BARRIER DIODE						
Forward voltage	V _F	I _F = 0.5A		0.42	0.47	V
Reverse current	I _R	V _R = 20V			100	μA
Junction capacitance	C _j	V _R = 10V, f = 1MHz		36		pF

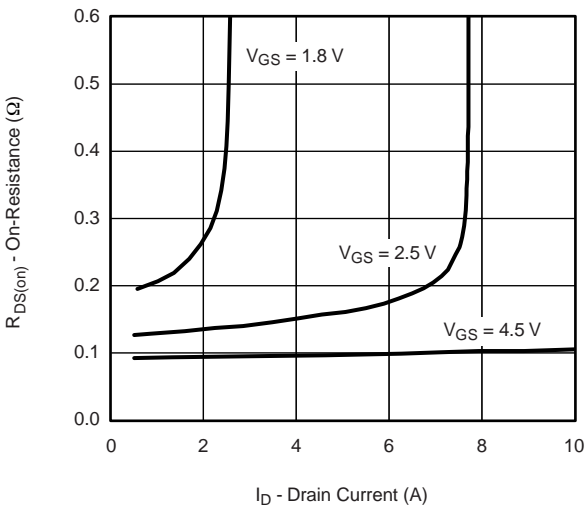
MOSFET TYPICAL CHARACTERISTICS (25°C, unless otherwise noted)



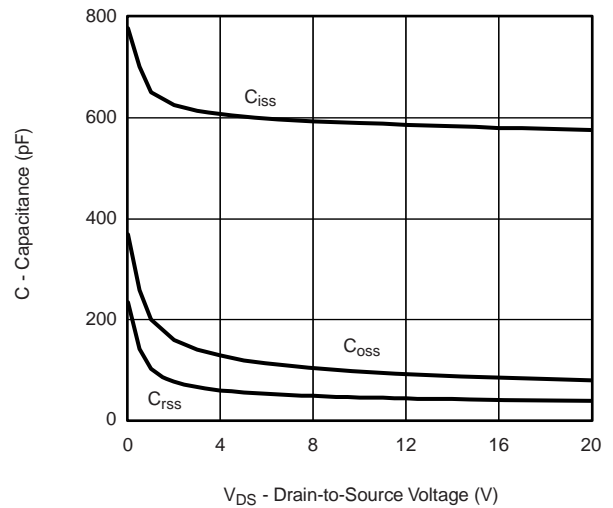
Output Characteristics



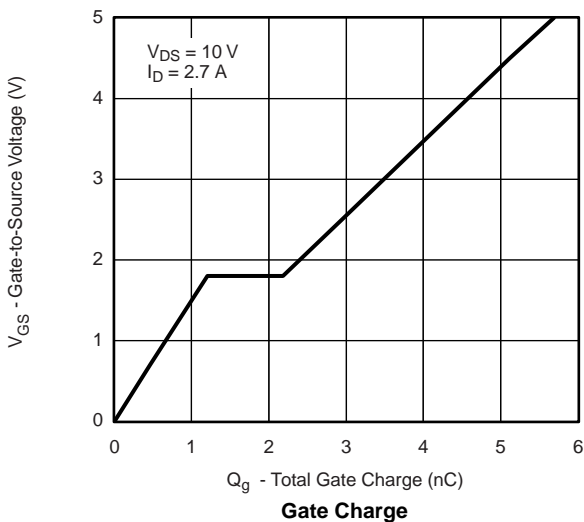
Transfer Characteristics



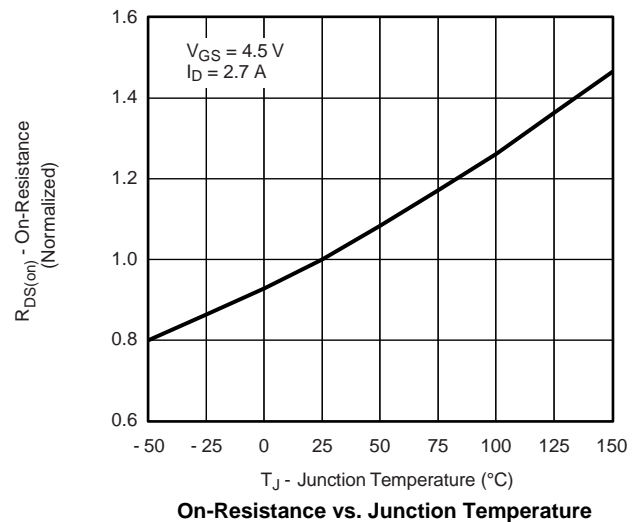
On-Resistance vs. Drain Current



Capacitance

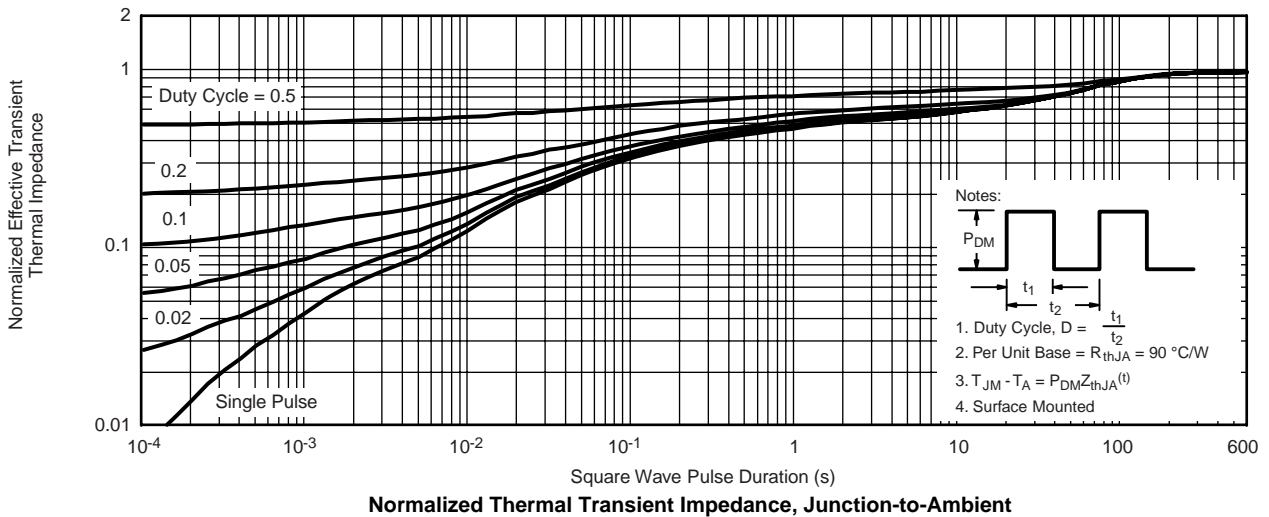
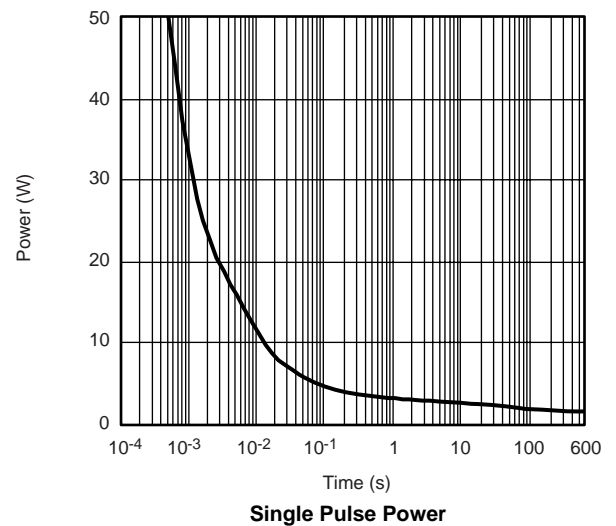
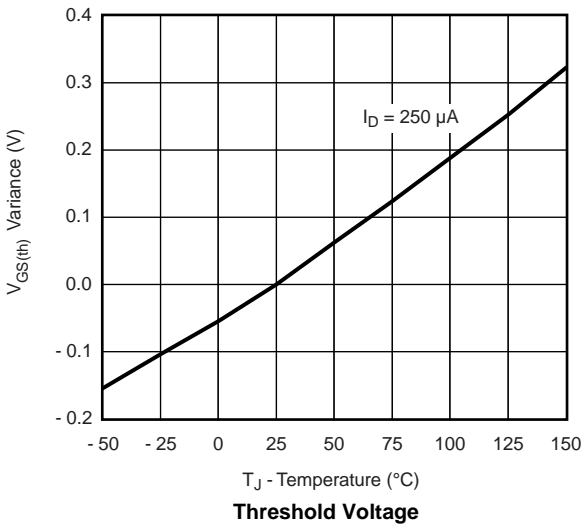
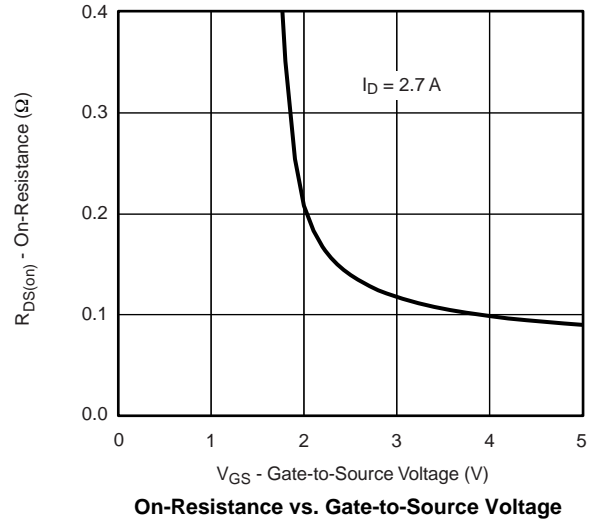
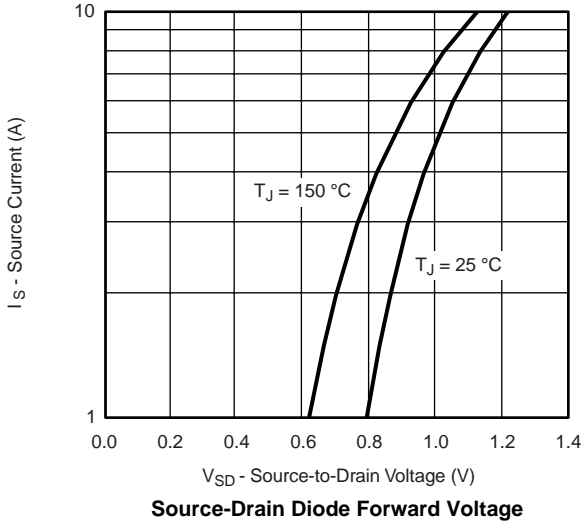


Gate Charge

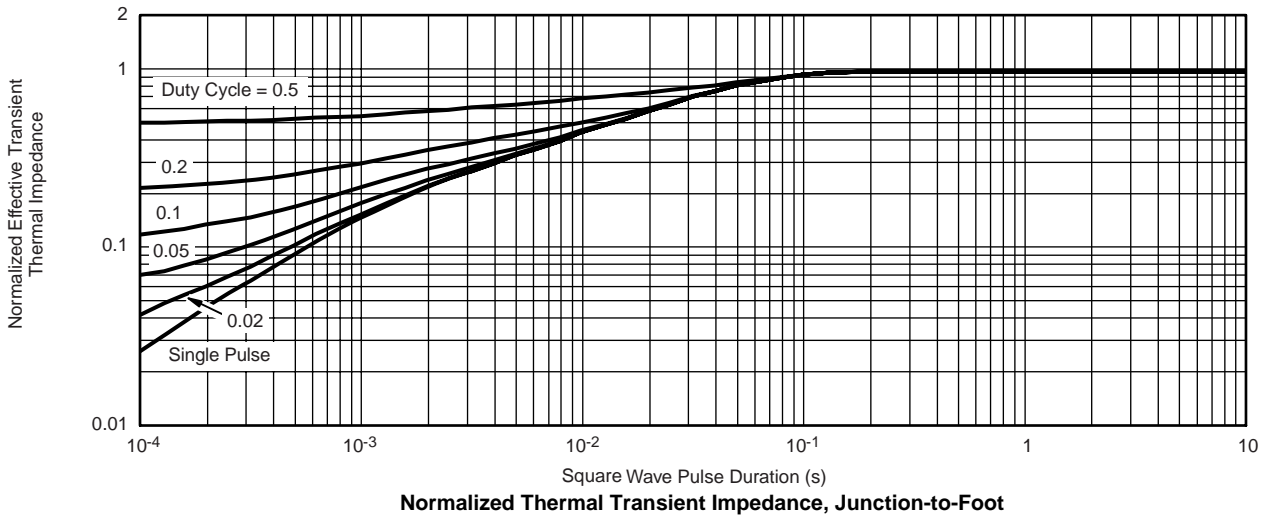
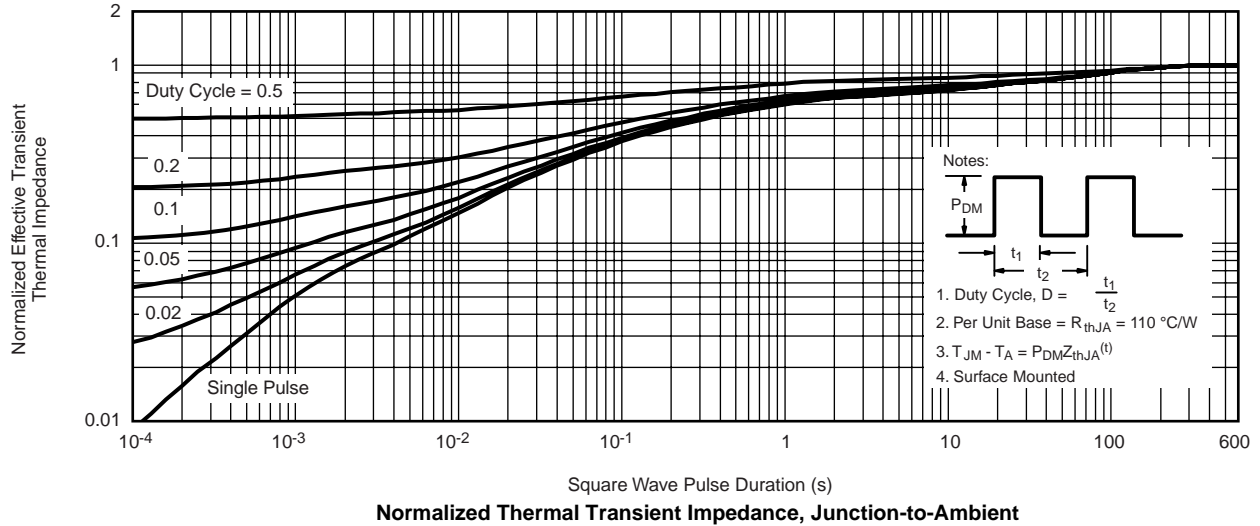


On-Resistance vs. Junction Temperature

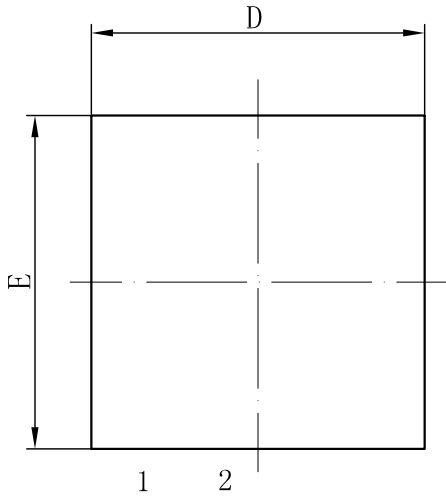
MOSFET TYPICAL CHARACTERISTICS (25°C, unless otherwise noted)



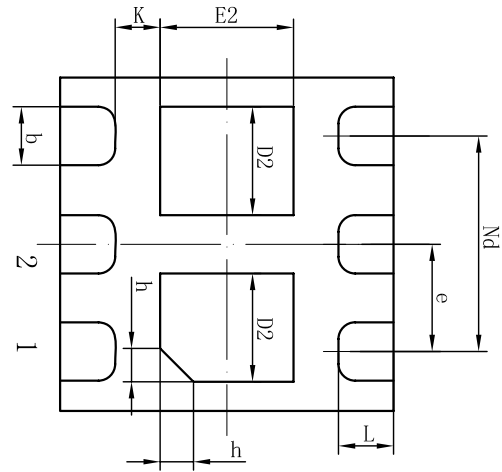
SCHOTTKY TYPICAL CHARACTERISTICS (25°C, unless otherwise noted)



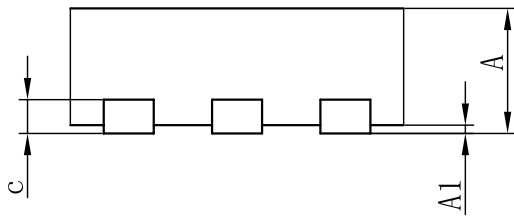
DFN2X2-6L Package Information



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