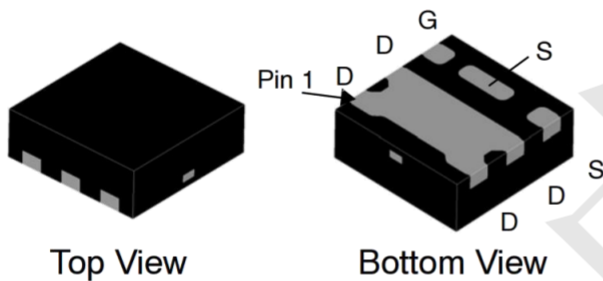


### Product Summary

- $V_{DS}$  20 V
- $I_{DS}$  ( $V_{GS}=4.5V$ ) 6.5 A
- $R_{DS(ON)}$  ( $V_{GS}=4.5V$ )  $\leq 22m\Omega$
- ESD protected gate typical

### Package and Pin Configuration

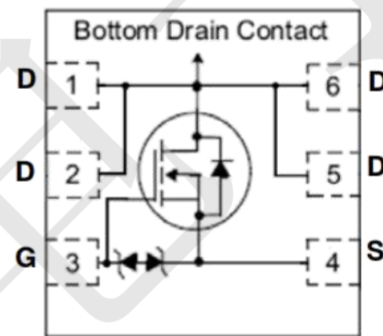


DFN1616-6

### Application

- Interfacing Switching
- DC-DC Converters
- Power management functions

### Circuit diagram



### Absolute Maximum Ratings ( $T_A=25^\circ C$ unless otherwise noted)

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	$V_{DS}$	20	V
Gate-Source Voltage	$V_{GS}$	$\pm 12$	V
Continuous Drain Current $T_A=25^\circ C$	$I_D$	6.5	A
Pulsed Drain Current ( $t = 100 \mu s$ )	$I_{DM}$	30	A
Maximum Power Dissipation	$P_D$	2.1	W
Operating Junction Temperature Range	$T_J$	-55 to +150	$^\circ C$
Storage Temperature Range	$T_{stg}$	-55 to +150	$^\circ C$

### Thermal Characteristic

PARAMETER	Symbol	Value	Unit
Thermal Resistance from Junction to Ambient( $t \leq 10s$ )	$R_{\theta JA}$	70	$^\circ C/W$
	PCB Mount (Note)		

**Note** : Device mounted on 1" x 1" FR-4 PCB with high coverage 2oz. Copper, single sided.

### Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise noted)

PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNIT
<b>Characteristics</b>						
Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> = 10μA	BV <sub>DSS</sub>	20	--	--	V
Gate-Source Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> = 250μA	V <sub>GS(th)</sub>	0.45	0.7	1.0	V
Gate-Source Leakage	V <sub>DS</sub> =0V, V <sub>GS</sub> = ±12V	I <sub>GSS</sub>	--	--	±10	μA
Zero Gate Voltage Drain Current	V <sub>DS</sub> = 20V, V <sub>GS</sub> =0V	I <sub>DSS</sub>	--	--	1.0	μA
Drain-Source On-State Resistance (Note 1)	V <sub>GS</sub> = 4.5V, I <sub>D</sub> =6.5A	R <sub>DS(on)</sub>	--	18	22	mΩ
	V <sub>GS</sub> = 2.5V, I <sub>D</sub> =5.5A		--	22	30	
	V <sub>GS</sub> = 1.8V, I <sub>D</sub> =5.0A		--	30	40	
Forward Transconductance (Note 2)	V <sub>DS</sub> = 5V, I <sub>D</sub> =6.5A	g <sub>fs</sub>	--	7	--	S
<b>Dynamic</b> (Note 2)						
Input Capacitance	V <sub>DS</sub> = 10V, V <sub>GS</sub> = 0V, F= 1.0MHz	C <sub>iss</sub>	--	1160	--	pF
Output Capacitance		C <sub>oss</sub>	--	200	--	
Reverse Transfer Capacitance		C <sub>rss</sub>	--	140	--	
<b>Switching</b>						
Turn-On Delay Time (Note 3)	V <sub>DS</sub> = 10V, V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 1A, R <sub>G</sub> = 3Ω.	t <sub>d(on)</sub>	--	6.5	--	nS
Rise Time (Note 3)		t <sub>r</sub>	--	13	--	
Turn-Off Delay Time (Note 3)		t <sub>d(off)</sub>	--	50	--	
Fall Time (Note 3)		t <sub>f</sub>	--	30	--	
Total Gate Charge	V <sub>DS</sub> = 10V, I <sub>D</sub> = 6.5A, V <sub>GS</sub> = 4.5V	Q <sub>g</sub>	--	10	--	nC
Gate Source Charge		Q <sub>gs</sub>	--	2.3	--	
Gate Drain Charge		Q <sub>gd</sub>	--	3.1	--	
<b>Source-Drain Diode Ratings and Characteristics</b> (Note 2)						
Forward Voltage	V <sub>GS</sub> = 0V, I <sub>F</sub> = 1A	V <sub>SD</sub>	--	0.8	1.1	V
Continuous Source Current	Integral reverse diode in the MOSFET	I <sub>S</sub>	--	--	6.5	A
Pulsed Current (Note 1)		I <sub>SM</sub>	--	--	30	A

Notes:

1. Pulse test; pulse width ≤ 300 μS, duty cycle ≤ 2%.
2. Guaranteed by design, not subject to production testing.
3. Independent of operating temperature

### TYPICAL CHARACTERISTICS

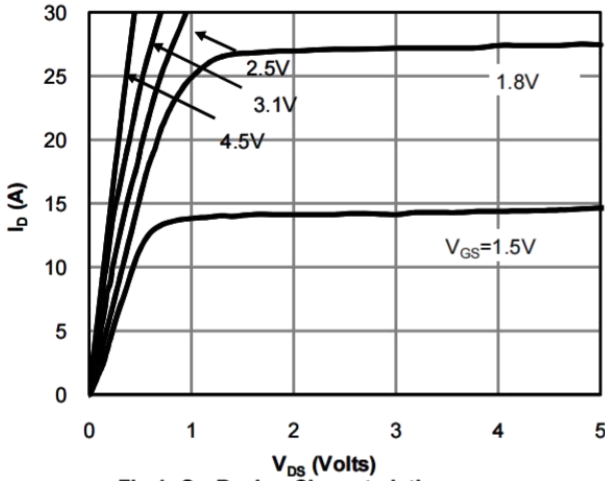


Fig 1: On-Region Characteristics

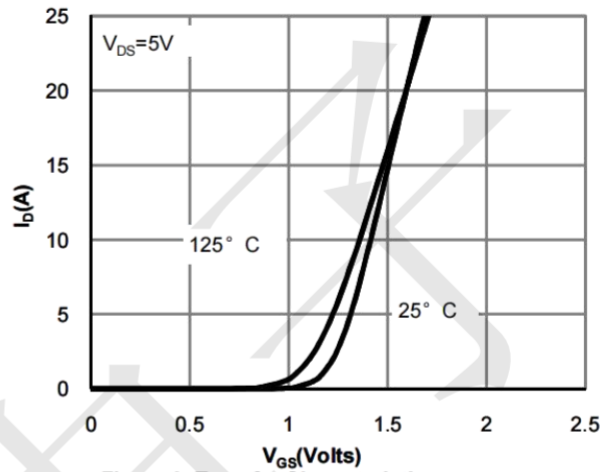


Figure 2: Transfer Characteristics

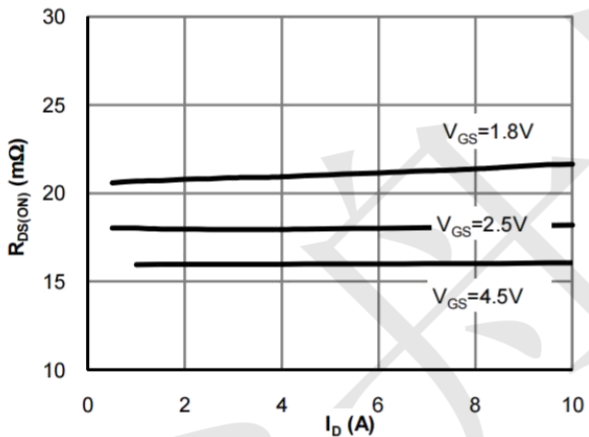


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

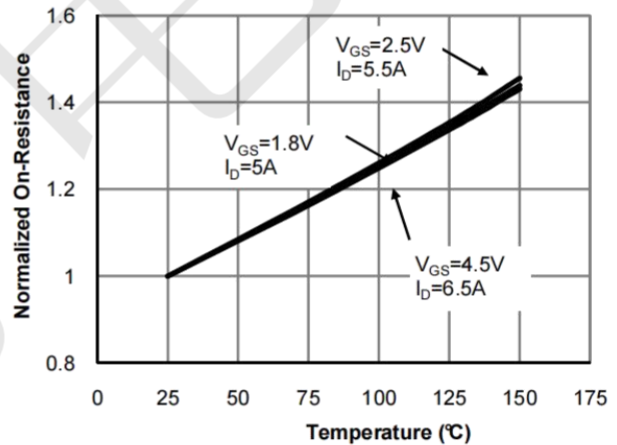


Figure 4: On-Resistance vs. Junction Temperature

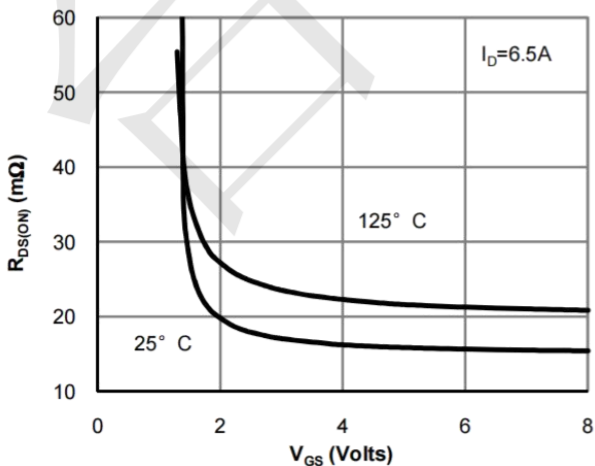


Figure 5: On-Resistance vs. Gate-Source Voltage

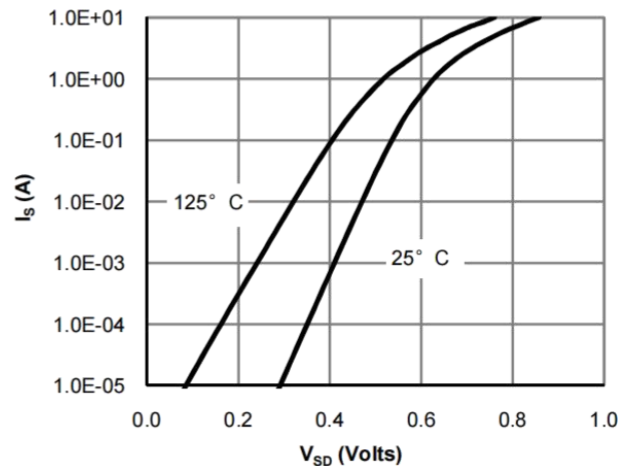
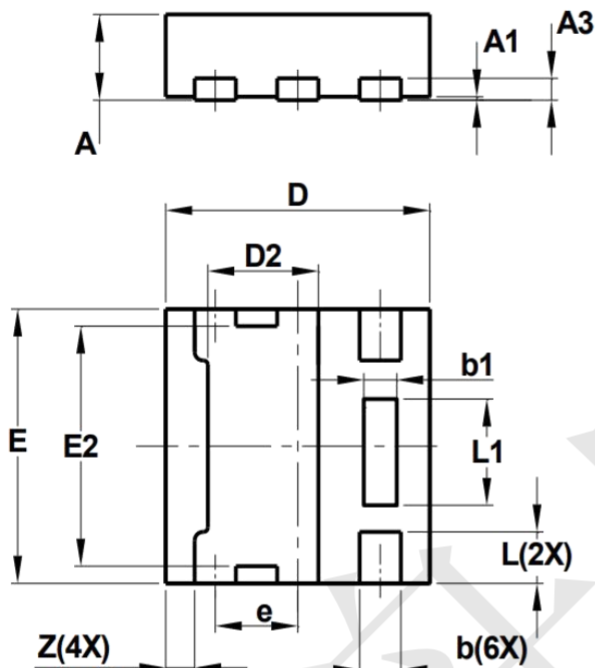


Figure 6: Body-Diode Characteristics

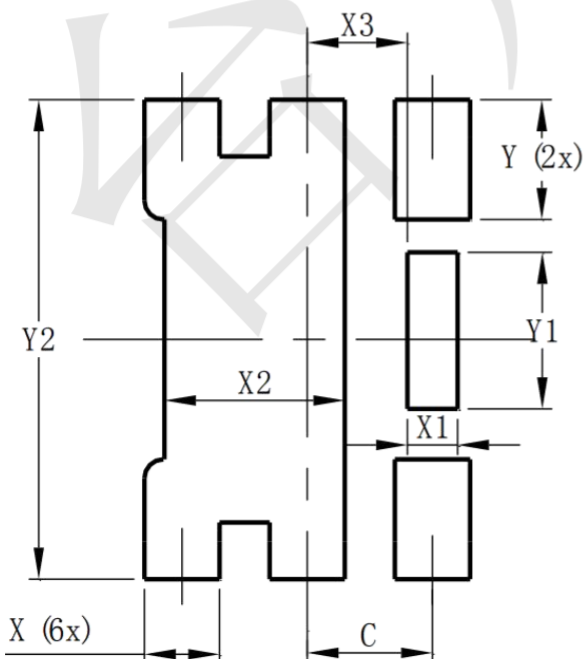
### Package Outline Dimensions

DFN1616-6 & DFN-6(1.6X1.6)



DFN1616-6 Type E			
Dim	Min	Max	Typ
A	0.47	0.53	0.50
A1	0	0.05	0.02
A3	—	—	0.13
b	0.20	0.30	0.25
b1	0.10	0.30	0.20
D	1.55	1.65	1.60
D2	0.57	0.77	0.67
E	1.55	1.65	1.60
E2	1.30	1.50	1.40
e	—	—	0.50
L	0.25	0.35	0.30
L1	0.52	0.72	0.62
Z	—	—	0.175
All Dimensions in mm			

### Mounting Pad Layout



Dimensions	Value (in mm)
C	0.500
X	0.300
X1	0.200
X2	0.720
X3	0.400
Y	0.475
Y1	0.620
Y2	1.900