



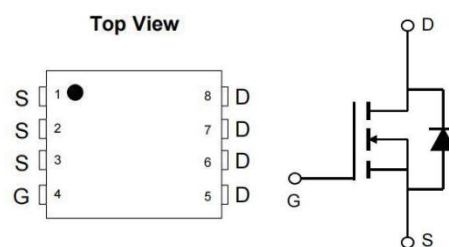
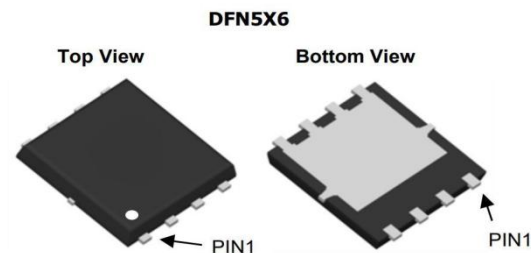
Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$ max	I_D max
60V	$<5.3m\Omega @V_{GS}=10V$	50A
	$<7.3m\Omega @V_{GS}=4.5V$	

Description and Applications

- Low $R_{DS(ON)}$
- Low Gate Charge
- ESD protected
- High efficiency power supply
- Secondary synchronous rectifier

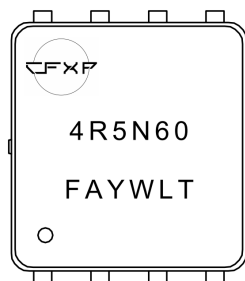
Package & Internal Circuit



Ordering Information

Part Number	Package Type	Package Qty
CFN4R5N60	DFN5x6	5,000/Tape & Reel

Marking Information



Green product

CFXP--Logo
4R5N60--Part Number
F--Fab location
A--Assembly location
Y--Year
W--Week
LT--Lot sequence

Absolute Maximum Rating ($T_{amb}=25^{\circ}C$ unless otherwise noted)

Parameter	Symbol	Value	Units
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current - Continuous	I_D	50	A
Pulsed Drain Current	I_{AS}	44.8	A
Single Pulse Avalanche Energy $L=0.2mH$	E_{AS}	196.2	mJ
Power Dissipation	P_D	48	W
	P_{DSM}	6.2	W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^{\circ}C$

Thermal Characteristics

Parameter	Symbol	Typ	Max	Units
Maximum Junction-to-Ambient	$R_{\theta JA}$		50	$^{\circ}\text{C/W}$
Maximum Junction-to-Case	$R_{\theta JC}$		2.6	$^{\circ}\text{C/W}$

Electrical Characteristics ($T_a=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Static Parameters						
BV_{DSS}	Drain-Source Breakdown Voltage	$I_D = 250\mu\text{A}$, $V_{GS} = 0\text{V}$	60			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 60\text{V}$, $V_{GS} = 0\text{V}$			1	μA
		$T_J = 55^{\circ}\text{C}$			5	μA
I_{GSS}	Gate-Body leakage current	$V_{DS} = 0\text{V}$, $V_{GS} = \pm 20\text{V}$			± 10	μA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}$, $I_D = 250\mu\text{A}$	1.1	1.5	2.0	V
$R_{DS(on)}$	Drain-Source on-Resistance	$V_{GS} = 10\text{V}$, $I_D = 20\text{A}$	3.8	4.5	5.3	m Ω
		$V_{GS} = 4.5\text{V}$, $I_D = 20\text{A}$	5.3	6.2	7.3	m Ω
g_{FS}	Forward Transconductance	$V_{DS} = 5\text{V}$, $I_D = 20\text{A}$		68		S
V_{SD}	Body Diode Forward Voltage	$I_S = 1\text{A}$, $V_{GS} = 0\text{V}$		0.68	1.0	V
Dynamic parameters						
C_{iss}	Input Capacitance	$V_{GS} = 0\text{V}$ $V_{DS} = 30\text{V}$ $f = 1.0\text{MHz}$		1978		pF
C_{oss}	Output Capacitance			386		pF
C_{rss}	Reverse Transfer Capacitance			14		pF
R_g	Gate resistance	$f = 1.0\text{MHz}$	3.5	4.5	5.5	Ω
Switching Parameters						
Q_g	Total Gate Charge	$V_{GS} = 10\text{V}$ $V_{DS} = 30\text{V}$ $I_D = 20\text{A}$		33.5		nC
Q_{gs}	Gate Source Charge			5		nC
Q_{gd}	Gate Drain Charge			6		nC
$t_{D(on)}$	Turn-On Delay Time	$V_{GS} = 10\text{V}$ $V_{DS} = 30\text{V}$ $R_L = 1.4\Omega$ $R_G = 3\Omega$		8		ns
t_r	Turn-On Rise Time			13		ns
$t_{D(off)}$	Turn-Off Delay Time			29		ns
t_f	Turn-Off Fall Time			8		ns
t_{rr}	Body Diode Reverse Recovery Time	$I_F = 10\text{A}$ $di/dt = 200\text{A}/\mu\text{s}$		34.4		ns
Q_{rr}	Body Diode Reverse Recovery Charge			54.6		nC

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

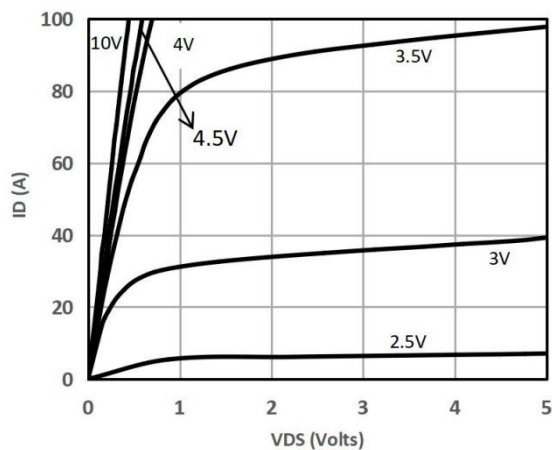


Figure 1: On-Region Characteristics

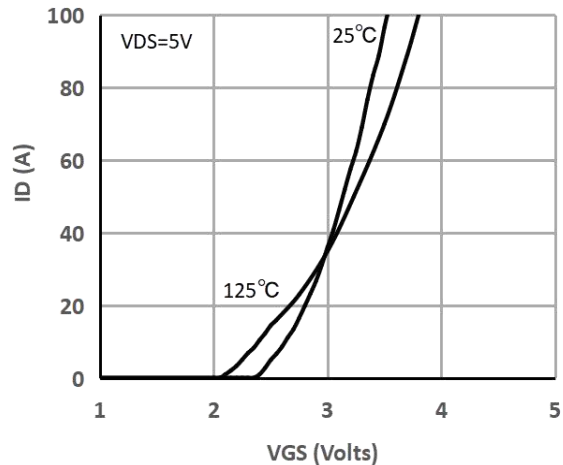


Figure 2: Transfer Characteristics

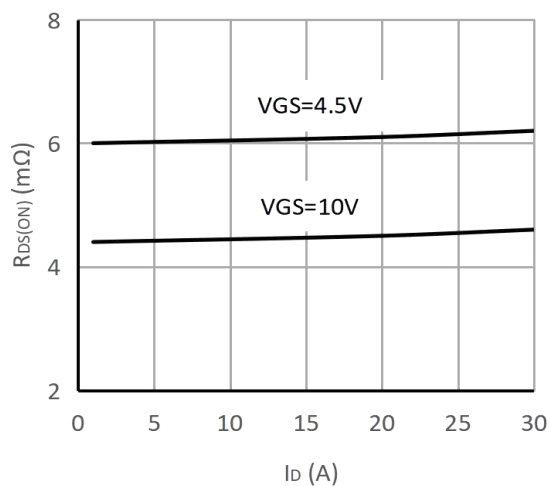


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

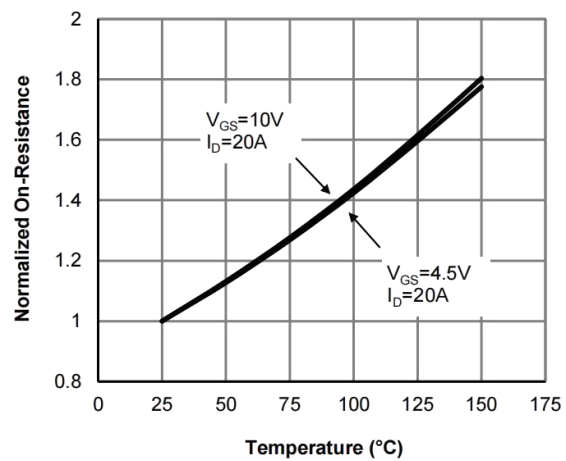


Figure 4: On-Resistance vs. Junction Temperature

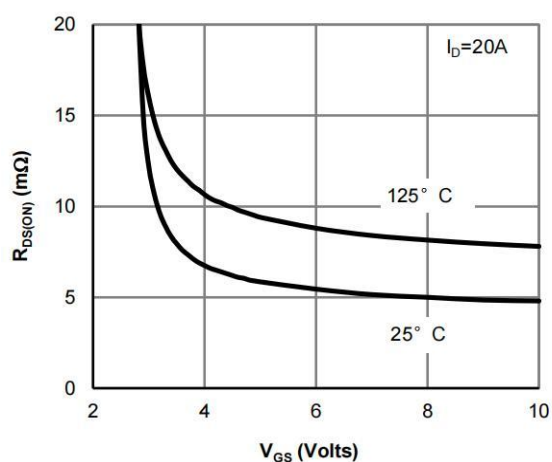


Figure 5: On-Resistance vs. Gate-Source Voltage

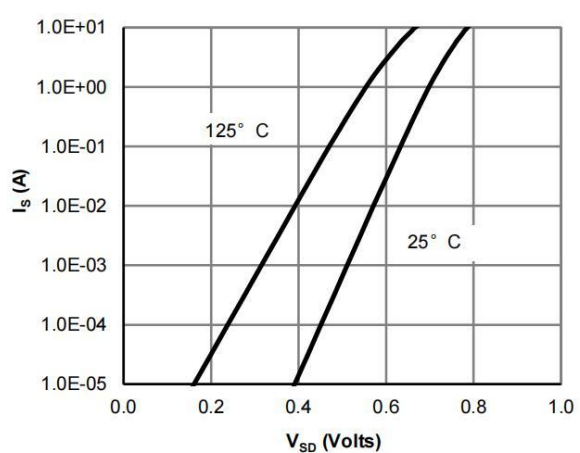


Figure 6: Body-Diode Characteristics

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

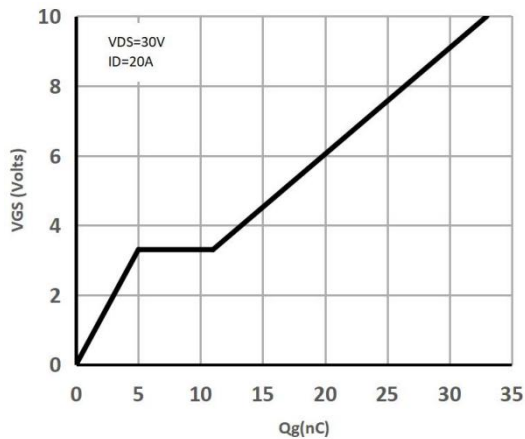


Figure 7: Gate-Charge Characteristics

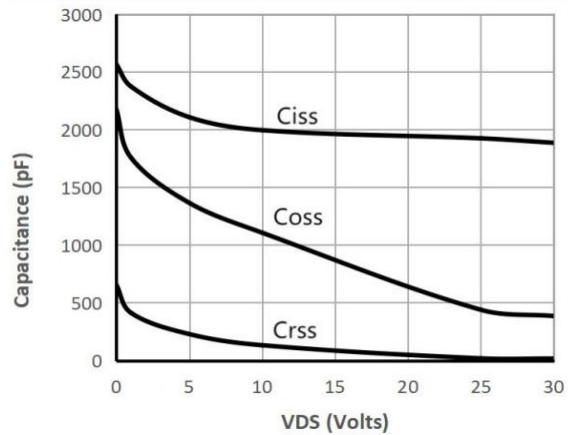


Figure 8: Capacitance Characteristics

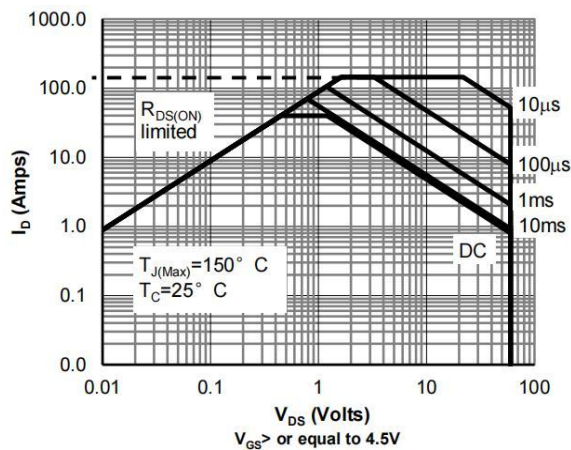


Figure 9: Maximum Forward Biased Safe Operating Area

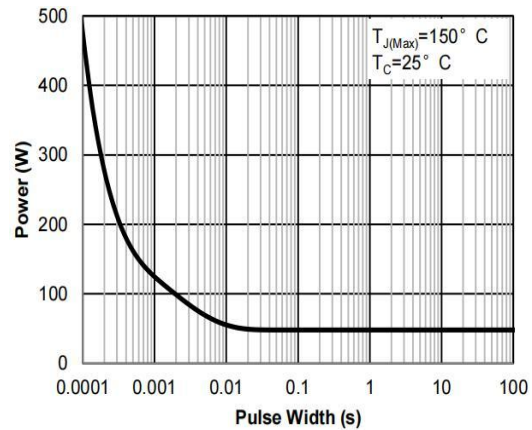


Figure 10: Single Pulse Power Rating Junction-to-Ambient

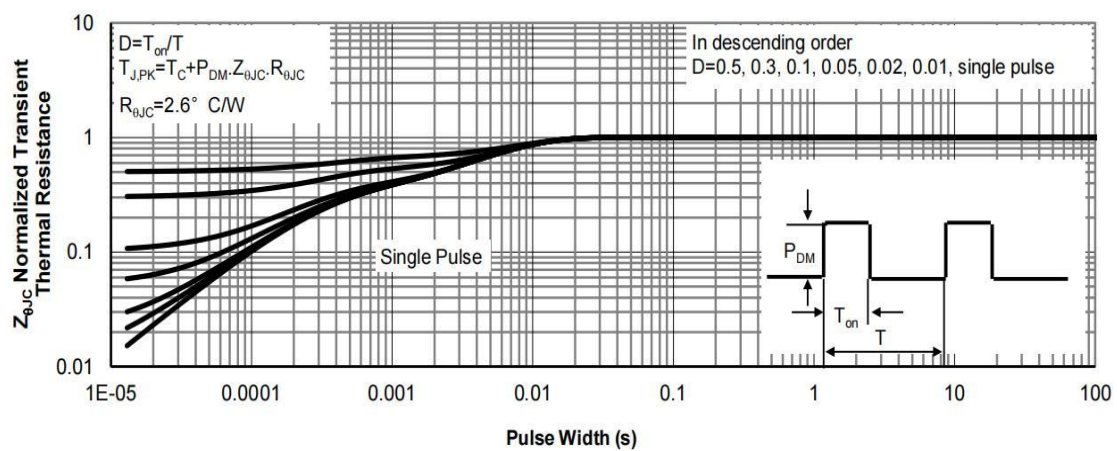
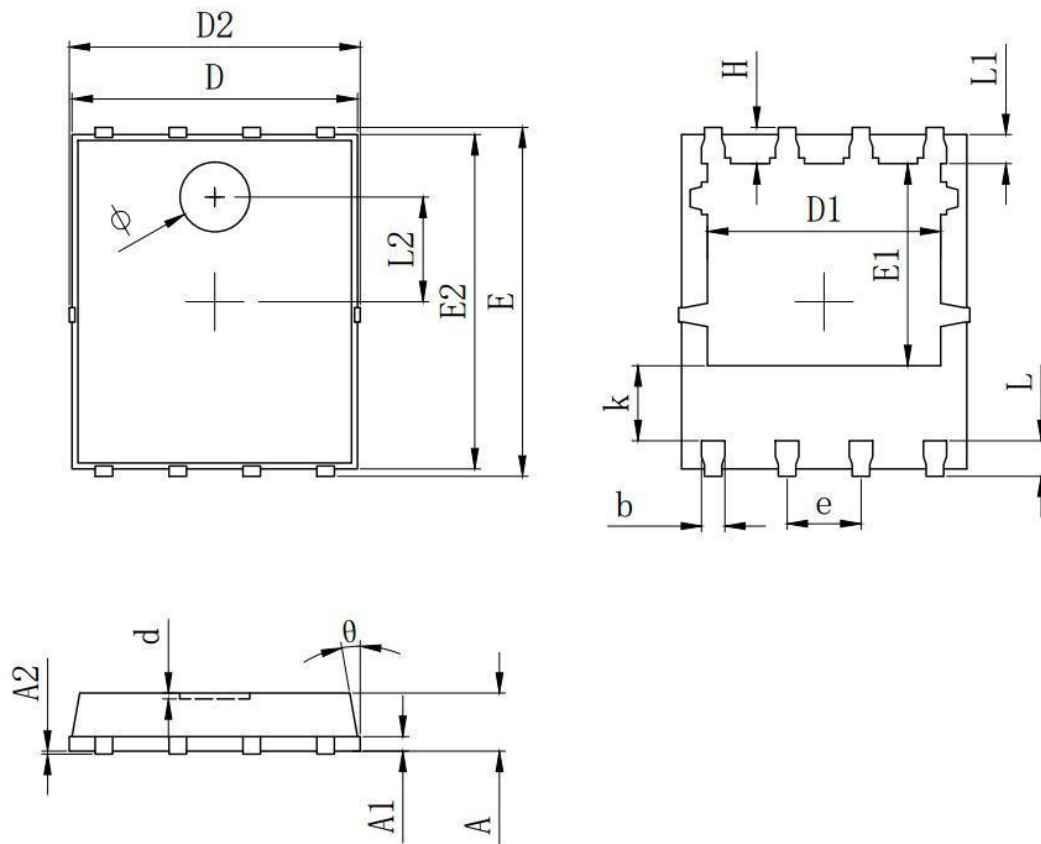


Figure 11: Normalized Maximum Transient Thermal Impedance

DFN5x6 Package



SYMBOL	MILLIMETER		
	MIN	TYP	MAX
A	0.900	1.000	1.100
A1	0.254 REF		
A2	0~0.05		
D	4.824	4.900	4.976
D1	3.910	4.010	4.110
D2	4.924	5.000	5.076
E	5.924	6.000	6.076
E1	3.375	3.475	3.575
E2	5.674	5.750	5.826

SYMBOL	MILLIMETER		
	MIN	TYP	MAX
b	0.350	0.400	0.450
e	1.270 REF		
L	0.534	0.610	0.686
L1	0.424	0.500	0.576
L2	1.800 REF		
k	1.190	1.290	1.390
H	0.549	0.625	0.701
θ	8°	10°	12°
Φ	1.100	1.200	1.300
d			0.100

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