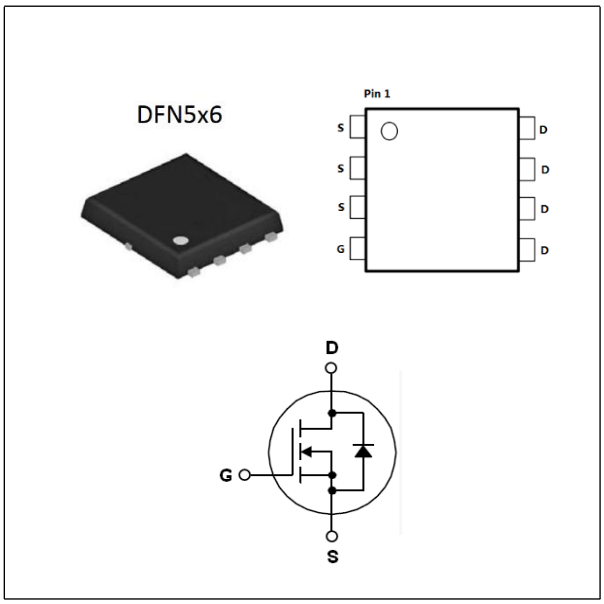
120V N-Channel Power MOSFET

Description

V_{DS}		120	V
$R_{DS\ (on),typ}$	V_{GS}=10V	6	mΩ
$R_{DS\ (on),typ}$	V_{GS}=4.5V	7.5	mΩ
$I_{D\ (Silicon\ Limited)}$		94.7	A
$I_{D\ (Package\ Limited)}$		60	A



Features

- High Speed Power Switching, Logic Level
- 100% UIS Tested，100% Rg Tested
- Enhanced Avalanche Ruggedness
- Enhanced Body diode dv/dt capability
- Lead Free, Halogen Free

Applications

- Synchronous Rectification in SMPS
- Hard Switching and High Speed Circuit
- DC/DC in Telecoms and Industrial

Absolute Maximum Ratings @T_C=25 ℃ unless otherwise noted

Symbol	Parameter		Ratings	Unit
V_{DSS}	Drain to Source Voltage		120	V
V_{GSS}	Gate to Source Voltage		±20	V
I_D	Drain Current	T_C=25℃	95	A
		T_C=100℃	60	A
	Continuous Drain Current(Package Limited)	T_C=25℃	60	A
I_{DM}	Pulsed Drain Current (Note1)		320	A
P_D	Maximum Power Dissipation	T_C=25℃	114	W
	Derate above 25℃		0.91	W/℃
E_{AS}	Single Pulsed Avalanche Energy (Note 2)		500	mJ
T_J	Operating Junction Temperature Range		-55~+150	℃
T_{STG}	Storage Temperature Range		-55~+150	℃

Thermal Characteristics

Symbol	Parameter	Ratings	Unit
$R_{th\ (J-C)}$	Thermal Resistance, Junction to case	1.1	℃/W
$R_{th\ (J-A)}$	Thermal Resistance, Junction to Ambient	55	℃/W

Electrical Characteristics @T_C=25 ℃ unless otherwise noted

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain to Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	120	-	-	V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	1.4	2	2.4	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	V_{GS}=10V, I_D=20A	-	6	7.5	mΩ
		V_{GS}=4.5V, I_D=20A	-	7.5	10	
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=120V, V_{GS}=0V, T_J=25℃	-	-	1	uA
		V_{DS}=120V, V_{GS}=0V, T_J=125℃	-	-	100	
I_{GSS}	Gate to Source Leakage Current	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
g_{fs}	Transconductance	V_{DS}=5V, I_D=20A	-	75	-	S
R_g	Gate Resistance	VGS=0V, VDS Open, f=1MHz	-	2.56	-	Ω

D-S Diode Characteristics and Maximum Rating @T_C=25 ℃ unless otherwise noted

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{SD}	Drain-Source Diode Forward Voltage	V_{GS}=0V, I_S=20A	-	0.9	1.2	V
t_{rr}	Reverse Recovery Time	V_R=60V, I_S=20A, di/dt=500A/us	-	45	-	ns
Q_{rr}	Reverse Recovery Charge		-	270	-	nC

Switching Characteristics @T_C=25 ℃ unless otherwise noted

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-on Delay Time	I_D=20A, V_{DD}=60V, V_{GS}=10V R_G=10Ω (Note 3)	-	15	-	ns
t_r	Rise Time		-	8	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	30	-	ns
t_f	Fall Time		-	9	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=60V, f=1.0MHz	-	3510	-	pF
C_{oss}	Output Capacitance		-	380	-	pF
C_{rss}	Reverse Transfer Capacitance		-	6.5	-	pF
Q_g(10V)	Total Gate Charge	I_D=20A, V_{DS}=60V V_{GS}=10V (Note 3)	-	45	-	nC
Q_g(4.5V)	Total Gate Charge		-	20	-	nC
Q_{gs}	Gate to Source Charge		-	8	-	nC
Q_{gd}	Gate to Drain Charge		-	6	-	nC

Note:

1. Repetitive rating: pulse-width limited by maximum junction temperature
2. V_{DD}=50V, L=0.4mH
3. Essentially independent of operating temperature typical characteristics

Typical Performance Characteristics

Fig. 1. Typical on-Resistance Characteristics

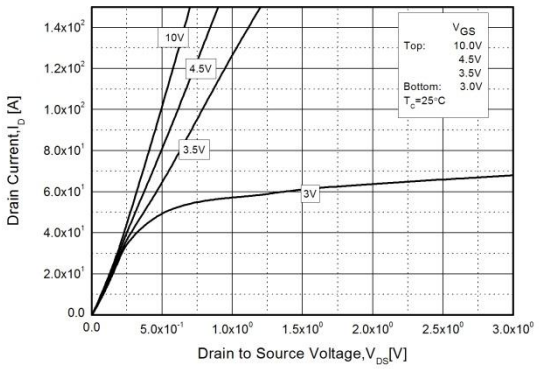


Fig. 2. Typical Transfer Characteristics

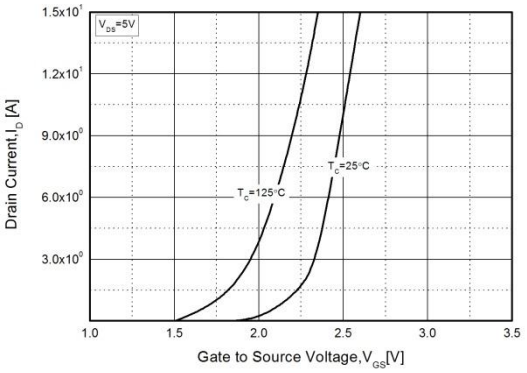


Fig. 3. Static on-Resistance vs. I_D

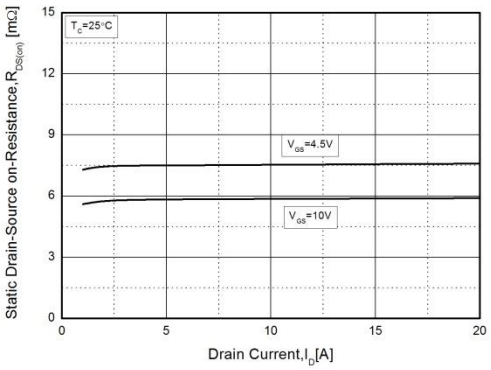


Fig. 4. Body Diode Forward Voltage vs. I_{DR}

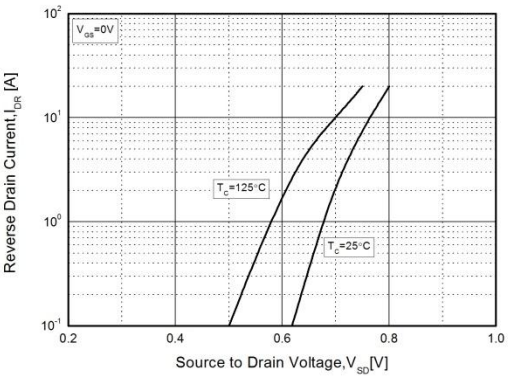


Fig. 5. Capacitance Characteristics

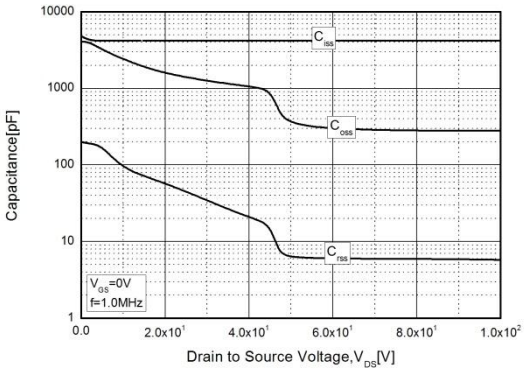
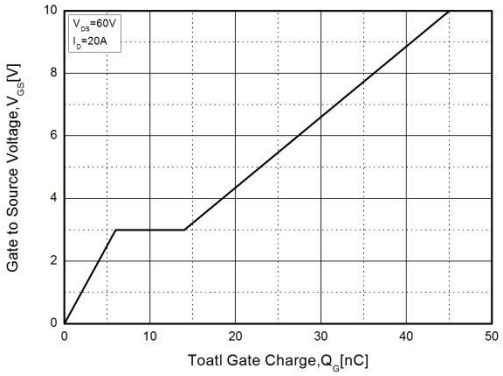


Fig. 6. Gate Charge Characteristics



Typical Performance Characteristics

Fig. 7. On-Resistance vs. Gate-Source Voltage

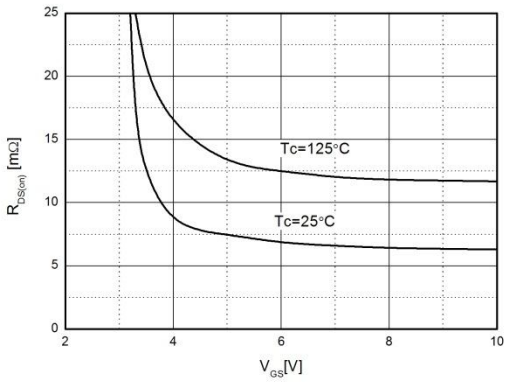


Fig. 8. Static on-Resistance vs. Temperature

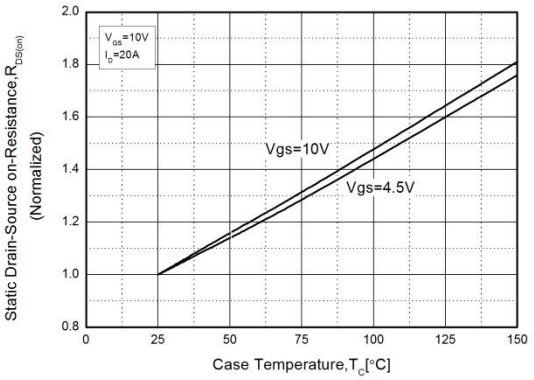


Fig. 9. Maximum Safe Operating Area

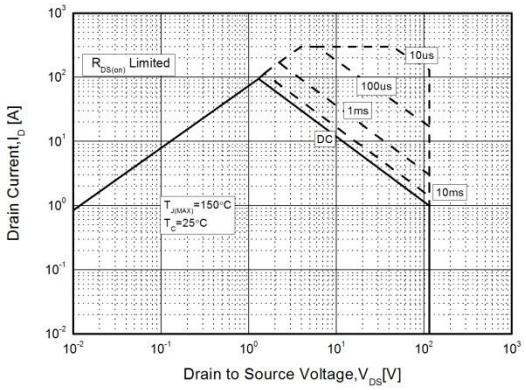


Fig. 10. Maximum Drain Current vs. Case Temperature

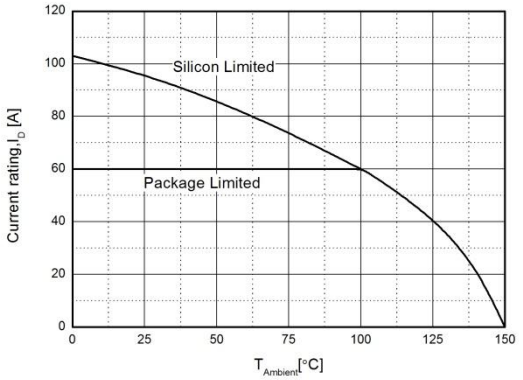
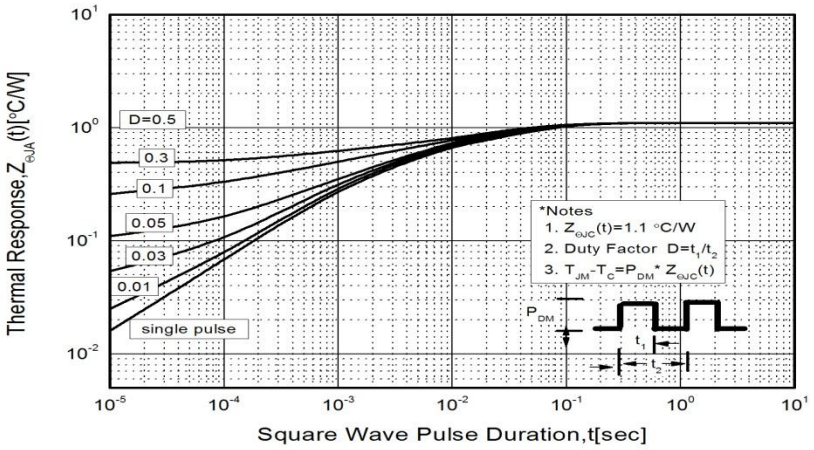


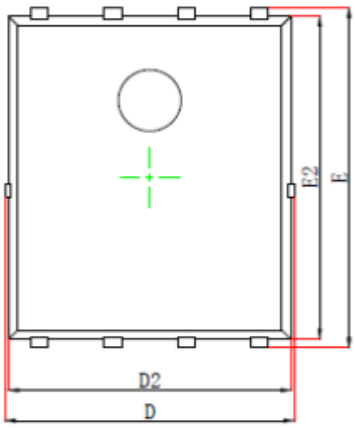
Fig. 11. Normalized Maximum Transient Thermal Impedance ,Junction-to-Ambient



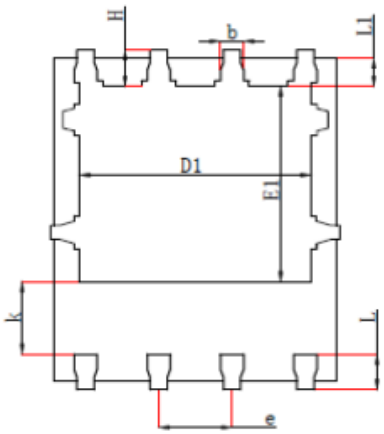
Package Dimensions

DFN5*6

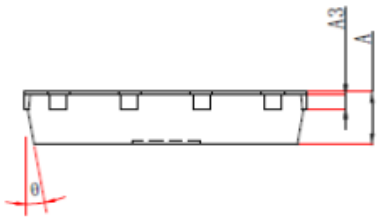
(Dimensions in Millimeters)



Top View
[顶视图]



Bottom View
[背视图]



Side View
[侧视图]

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A3	0.254 REF		0.010REF	
D	4.680	5.120	0.184	0.202
E	5.900	6.126	0.232	0.241
D1	3.610	4.110	0.142	0.162
E1	3.380	3.780	0.133	0.149
D2	4.800	5.000	0.189	0.197
E2	5.674	5.826	0.223	0.229
k	1.100	1.390	0.043	0.055
b	0.330	0.510	0.013	0.020
e	1.270TYP		1.270TYP	
L	0.510	0.711	0.020	0.028
L1	0.424	0.576	0.017	0.023
H	0.410	0.726	0.016	0.029
θ	0^0	12^0	0^0	12^0