

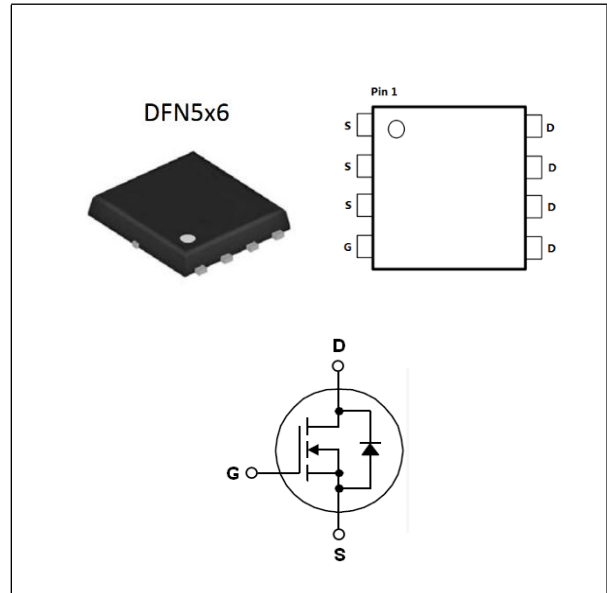
120V N-Channel Power MOSFET

Description

V_{DS}		120	V
$R_{DS(on),typ}$	$V_{GS}=10V$	6	m Ω
$R_{DS(on),typ}$	$V_{GS}=4.5V$	7.5	m Ω
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 @ $T_C=25^\circ\text{C}$ 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	$T_C=25^\circ\text{C}$	95
		$T_C=100^\circ\text{C}$	60
	Continuous Drain Current(Package Limited)	$T_C=25^\circ\text{C}$	60
I_{DM}	Pulsed Drain Current (Note1)	320	A
P_D	Maximum Power Dissipation	$T_C=25^\circ\text{C}$	114
	Derate above 25°C		0.91
E_{AS}	Single Pulsed Avalanche Energy (Note 2)	500	mJ
T_J	Operating Junction Temperature Range	-55~+150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55~+150	$^\circ\text{C}$

Thermal Characteristics

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

Electrical Characteristics @T_c=25 °C 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°C	-	-	1	uA
		V _{DS} =120V, V _{GS} =0V, T _J =125°C	-	-	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 °C 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 °C 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		-	45	-	nC
Q _{g(4.5V)}	Total Gate Charge	I _D =20A, V _{DS} =60V V _{GS} =10V (Note 3)	-	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

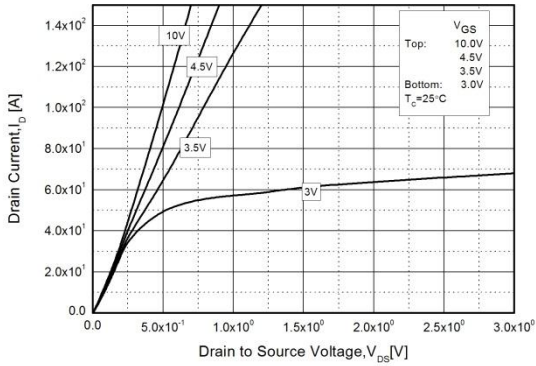


Fig. 2. Typical Transfer Characteristics

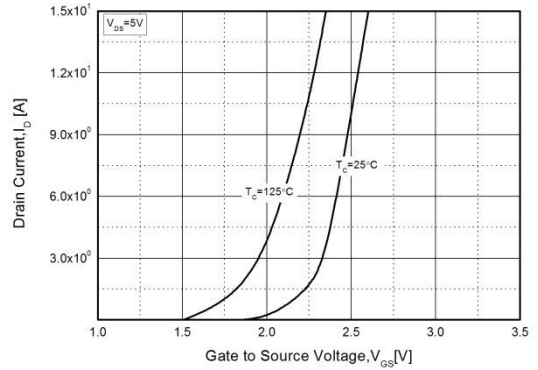


Fig. 3. Static on-Resistance vs. I_D

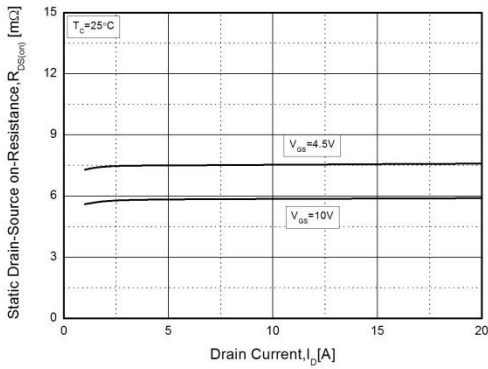


Fig. 4. Body Diode Forward Voltage vs. I_{DR}

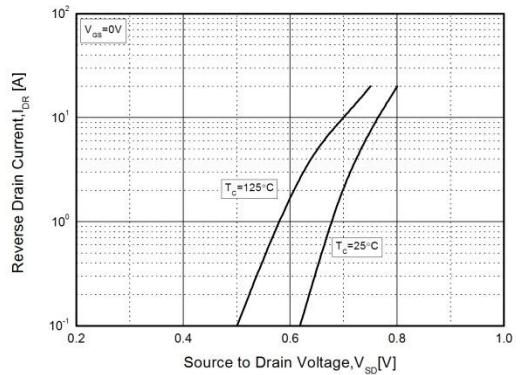


Fig. 5. Capacitance Characteristics

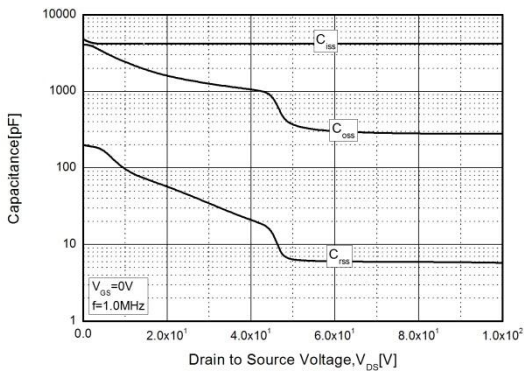
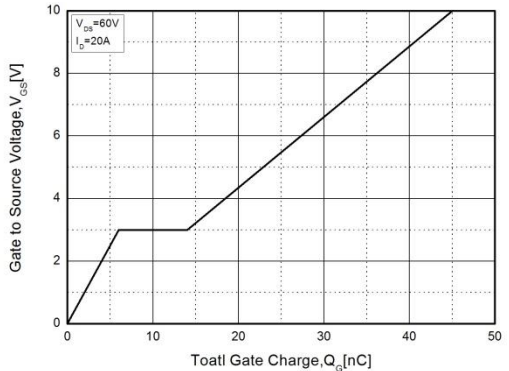


Fig. 6. Gate Charge Characteristics



Typical Performance Characteristics

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

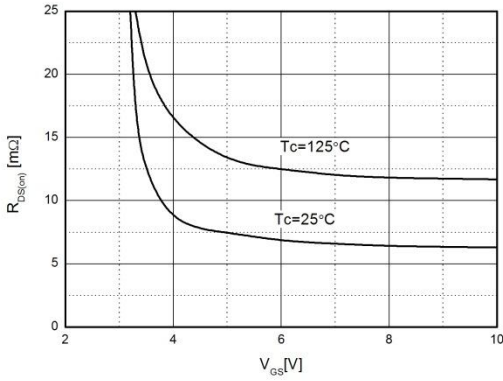


Fig. 8. Static on-Resistance vs. Temperature

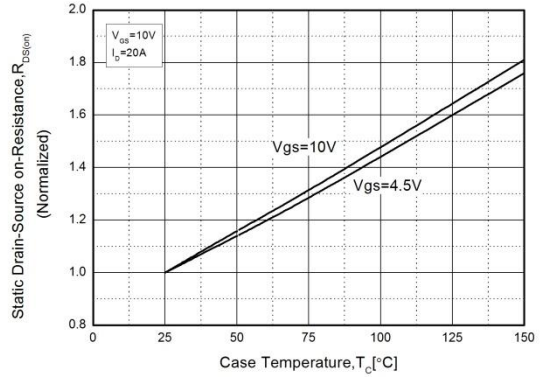


Fig. 9. Maximum Safe Operating Area

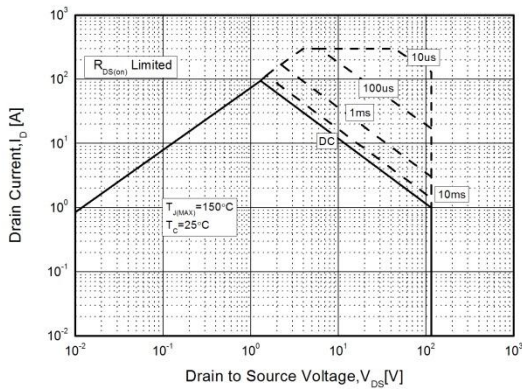


Fig. 10. Maximum Drain Current vs. Case Temperature

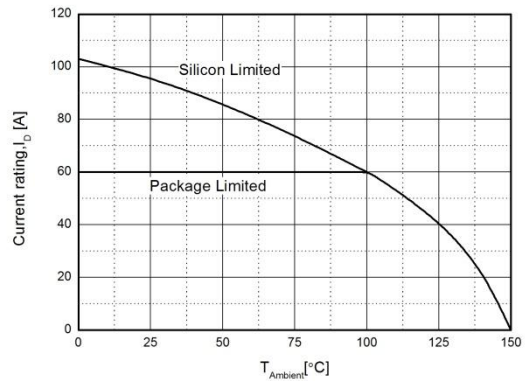
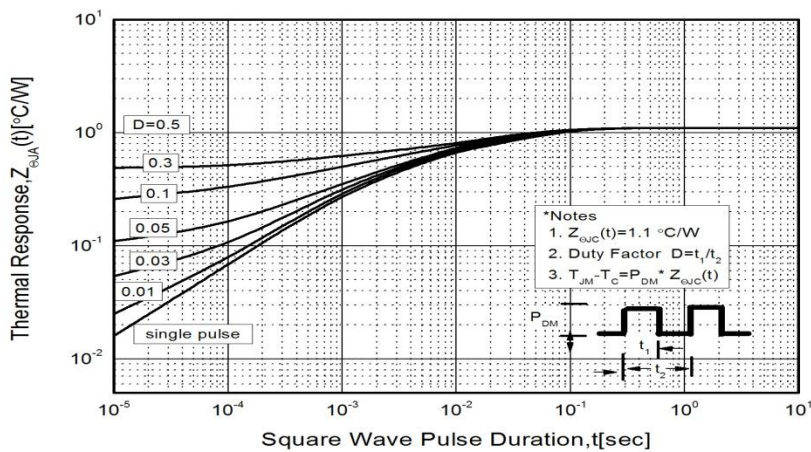
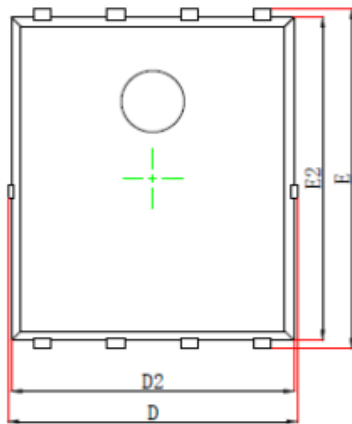
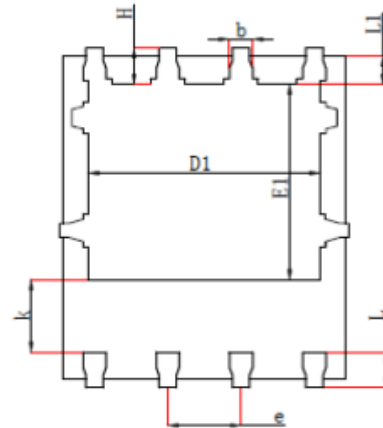
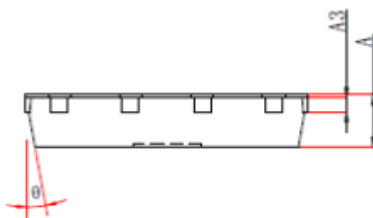


Fig. 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Ambient



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
theta	0°	12°	0°	12°