MOSFETs Silicon 450V N-Channel MOS

■ Applications

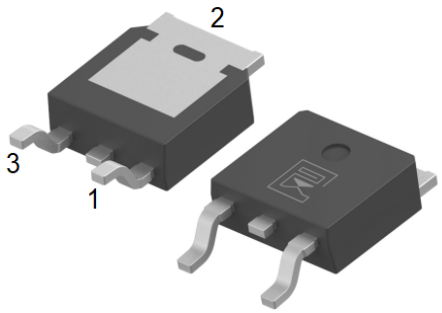
- Power factor correction（PFC）
- Switched mode power supplies(SMPS)
- Uninterruptible Power Supply（UPS）

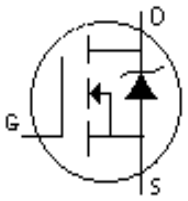
■ Features

- Low Crss
- Ultra Low Gate Charge
- Fsat switching capability
- RoHS Compliant
- 100% UIS and RG Tested

■ Product Summary

V_{DS}	450	V
I_D	11	A
$R_{DS(ON)}$,Typ@10V	0.42	Ω
Q_g	30	nC





Gate： 1

Drain： 2

Source： 3

TO-252

Marking	Package	Packaging	Min. package quantity
MKIRF11N45B	TO-252	Tape & Reel	3000

■ Absolute Maximum Ratings（Tc=25℃ unless otherwise noted)

Parameter			Symbol	Ratings	Unit
Drain-Source Voltage			V_{DS}	450	V
Gate-Source Voltage			V_{GS}	±30	V
Continuous Drain Current	Tc=25℃	(Note 1)	I_D	11	A
Continuous Drain Current	Tc=100℃	(Note 1)		6.5	
Drain Current-Pulsed		(Note 1)	I_{DM}	44	A
Total Dissipation			P_D	113	W
Junction Temperature			T_j	150	℃
Storage Temperature			T_{stg}	-55-150	℃
Single Pulse Avalanche Energy		(Note 2)	E_{AS}	333	mJ

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

■ Thermal Characteristics

Parameter	Symbol	Max	Unit
Maximum Junction-to-Case	$R_{\theta JC}$	1.1	℃/W
Maximum Junction-to-Ambient	$R_{\theta JA}$	60	℃/W

Note 1：Ensure that the channel temperature does not exceed 150℃.

Note 2：V_{DD}=100V, T_{ch}= 25℃(initial), I_{AS}=36.5A, R_g=25Ω, L=0.5mH.

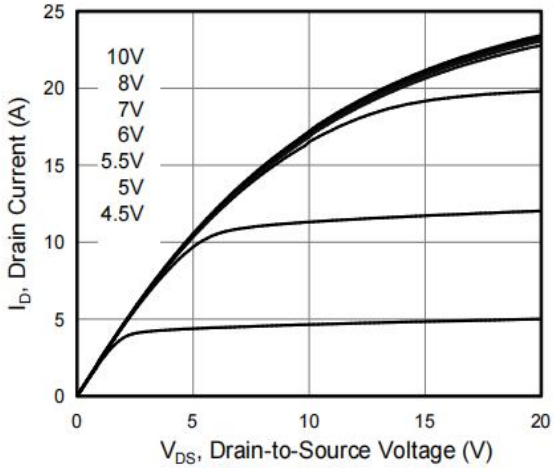
Note 3： The value of $R_{\theta JA}$ is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25° C. The value in any given application depends on the user's specific board design.

Note：This transistor is sensitive to electrostatic discharge and should be handled with care.

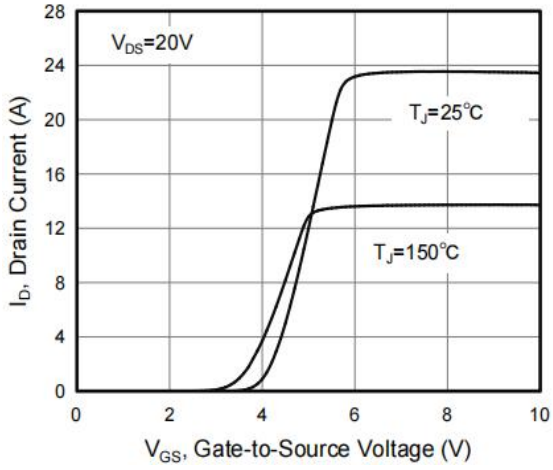
■ Electrical Characteristics（Tc=25℃ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static Parameters						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_D=250uA	450	-	-	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=450V,V_{GS}=0V	-	-	1	uA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±30V,V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS}=V_{DS},I_D=250uA	2	3	4	V
Drain-Source On Resistance	$R_{DS(ON)}$	V_{GS}=10V,I_D=5.5A	-	0.42	0.45	Ω
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}=25V,V_{GS}=0V, f=1.0MHz	-	1352	-	pF
Output Capacitance	C_{oss}		-	122	-	pF
Reverse Transfer Capacitance	C_{rss}		-	2.9	-	pF
Gate Resistance	R_g	V_{DS}=0V,V_{GS}=0V, f=1.0MHz	-	1.6	-	Ω
Switching Paramters						
Turn-On Delay Time	$t_{d(on)}$	V_{DS}=225V,I_D=11A, V_{GS}=10V,R_G=25Ω	-	29	-	ns
Turn-On Rise Time	t_r		-	48	-	ns
Turn-Off Delay Time	$t_{d(off)}$		-	56	-	ns
Turn-Off Rise Time	t_f		-	35	-	ns
Total Gate Charge	Q_g	V_{DS}=360V,I_D=11A, V_{GS}=10V	-	30	-	nC
Gate-Source Charge	Q_{gs}		-	8.2	-	nC
Gate-Drain Charge	Q_{gd}		-	9.1	-	nC
Source-Drain Characteristics						
Max. Diode Forward Cuurent	I_S		-	-	11	A
Max. Pulsed Forward Cuurent	I_{SM}		-	-	44	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_S=10A	-	0.87	1.2	V
Reverse Recovery Time	t_{rr}	V_R=400V,I_F=10A, di/dt=100A/us	-	277	-	ns
Reverse Recovery Charge	Q_{rr}		-	2.2	-	μC

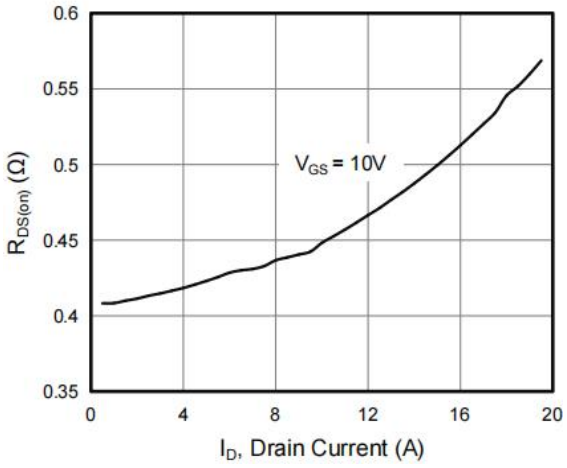
■ Characteristics Curves



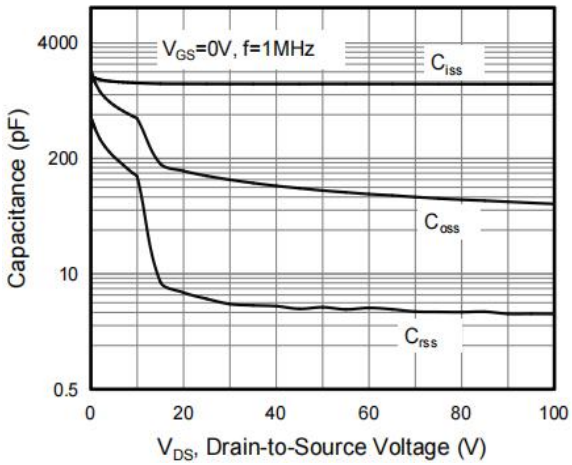
Output Characteritsics



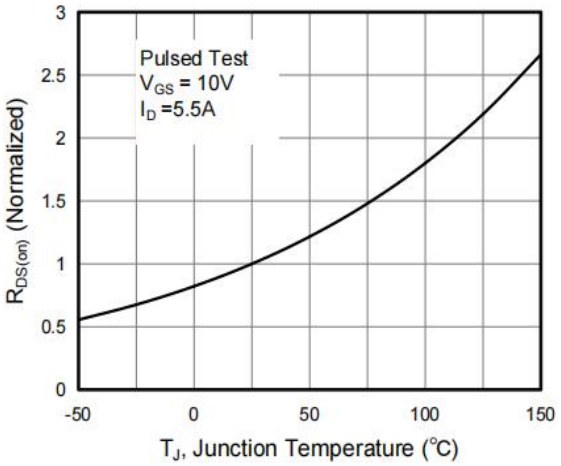
Transfer Characteritsics



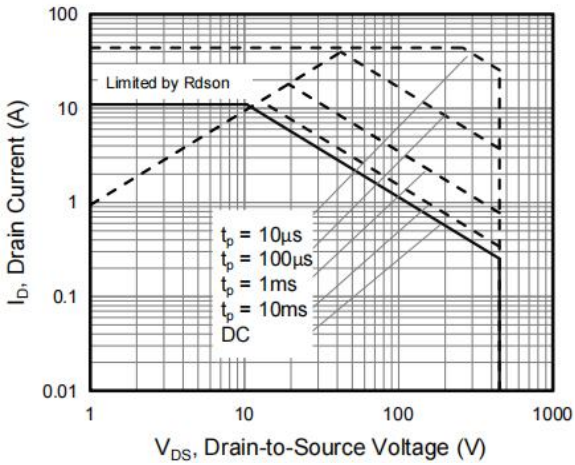
On Resistance Vs Drain Current



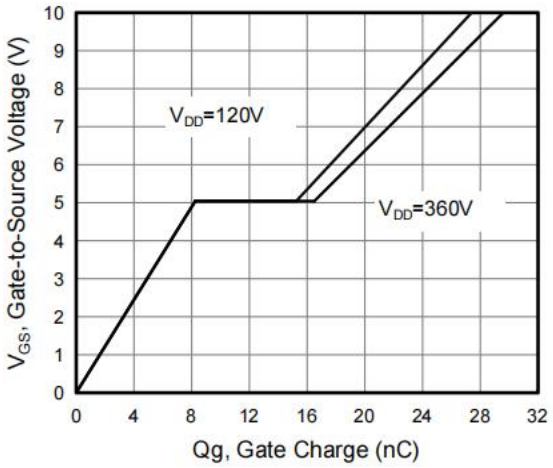
Capacitance



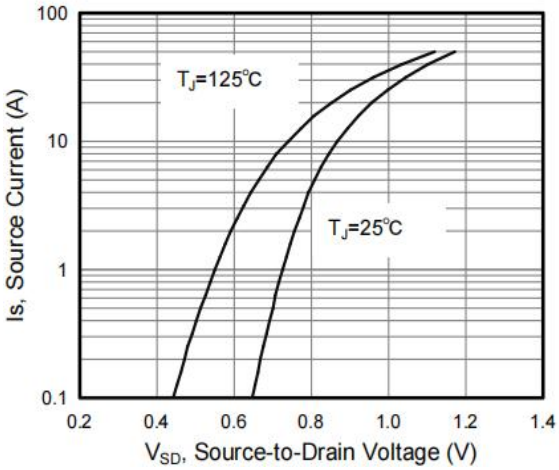
Rdson-JunctionTemperature



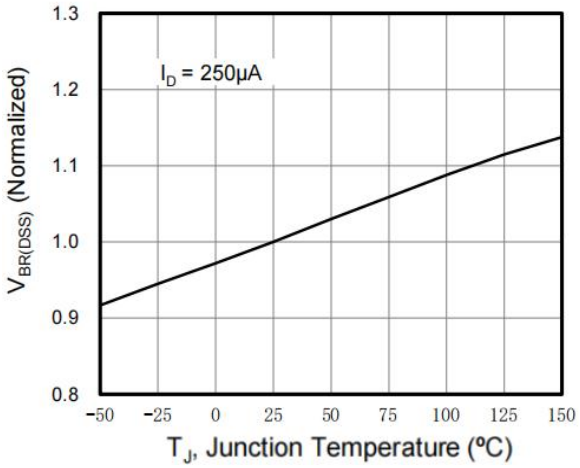
Safe Operating Area



Gate Charge Waveform



Source-Drain Diode Forward Voltage

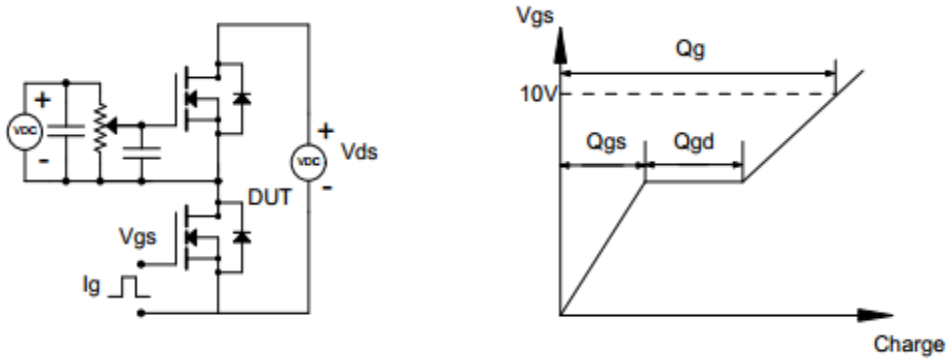


Breakdown Voltage Vs Junction Temperature

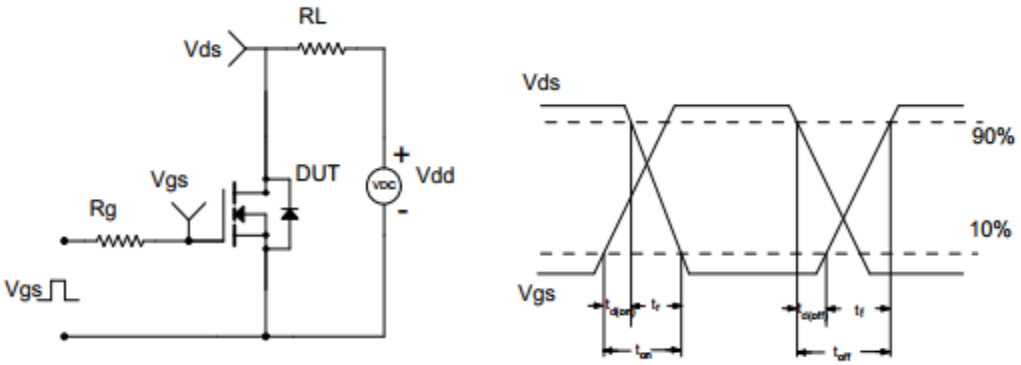
Note： The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.

■ Test Circuit & Waveform

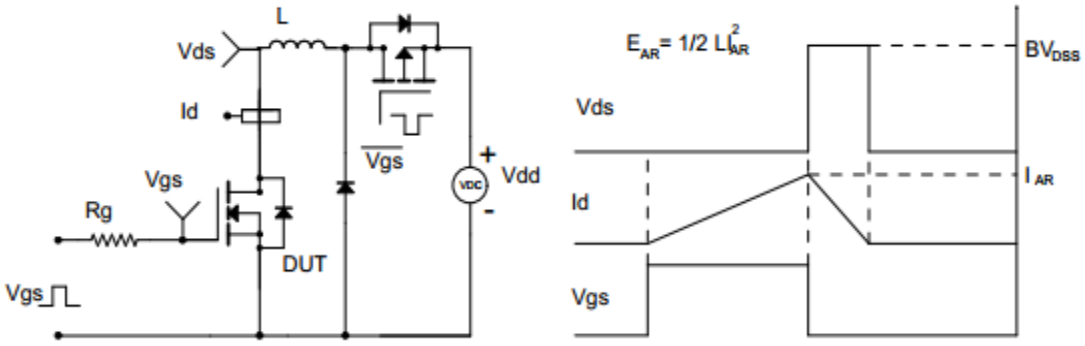
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveform



Unclamped Inductive Switching (UIS) Test Circuit & Waveform



■ TO-252 Package Dimensions

Unit：mm

Symbol	Min	Nom	Max	Symbol	Min	Nom	Max
A	2.10		2.50	E	5.80		6.30
B	0.80		1.25	e1	2.25	2.30	2.35
b	0.50		0.85	e2	4.45		4.75
b1	0.50		0.90	L1	9.50		10.20
b2	0.45		0.60	L2	0.90		1.45
C	0.45		0.60	L3	0.60		1.10
D	6.35		6.75	K	-0.1		0.10
D1	5.10		5.50