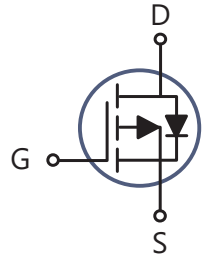
NKC15P50A

-150V P Channel Enhancement MOSFET Datasheet

Ver 1.0

PRODUCT SUMMARY	
V_{DSS}	-150V
I_D	-20A
$R_{DS(ON)}$ (mΩ) Typ	56 @ V_{GS}=-10V



Features

- High - speed switching
- Excellent gate charge x Rds(ON) procuct (FOM)
- Super high density cell design for extremely low RDS(ON)
- Exceptional on-resistance and maximum DC current capability
- RoHS and Halogen - free compliant

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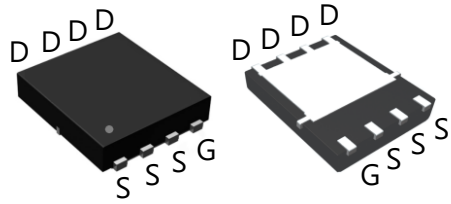

ABSOLUTE MAXIMUM RATINGS (T_C=25°C unless otherwise noted)

Parameter		Symbol	Limit	Units
Drain-Source Voltage		V_{DS}	-150	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current-Continuous (Note 2)	T_C=25°C	I_D	-20	A
	T_C=70°C		-17	A
-Pulsed (Note 1、Note 2)		I_{DM}	-80	A
Single Pulse Avalanche Energy (Note 3)		E_{AS}	361	mJ
Maximum Power Dissipation	T_C=25°C	P_D	135	W
	T_C=70°C		86	W
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.92	°C/W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	°C/W

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ELECTRICAL CHARACTERISTICS (T_C=25°C unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V , I_D=-250uA	-150			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-120V , V_{GS}=0V			-1	uA
Gate-Body Leakage Current	I_{GSS}	V_{GS}= ±20V , V_{DS}=0V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS} , I_D=-250uA	-2	-3	-4	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=-10V , I_D=-20A		56	70	m ohm
Forward Transconductance	g_{FS}	V_{DS}=10V , I_D=-20A		13		S
DYNAMIC CHARACTERISTICS (Note 4)						
Input Capacitance	C_{ISS}	V_{DS}=-75V,V_{GS}=0 V f=1.0MHz		5980		pF
Output Capacitance	C_{OSS}			760		pF
Reverse Transfer Capacitance	C_{RSS}			315		pF
Total Gate Charge	Q_g	V_{DS}=-75V,I_D=-10A,V_{GS}=-10V		93.4		nC
Gate-Source Charge	Q_{gs}	V_{DS}=-75V,I_D=-10A , V_{GS}=-10V		18		nC
Gate-Drain Charge	Q_{gd}			14		nC
SWITCHING CHARACTERISTICS (Note 4)						
Turn-On Delay Time	$t_{D(ON)}$	V_{DD}=-75V I_D=-10A V_{GS}=-10V R_{GEN}= 6 ohm		60		ns
Rise Time	tr			32		ns
Turn-Off Delay Time	$t_{D(OFF)}$			228		ns
Fall Time	tf			82		ns
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_S=-2A		-0.7	-1.3	V

Notes

1.Pulse Test Width ≤ 300us,Duty Cycle≤ 2%.
2.Drain current limited by maximum junction temperature.
3.Starting Tj=25°C ,L=0.5mH,V_{DD}=-75V.(See Figure11)
4.Guaranteed by design,not subject to production testing.

Figure 1. Output Characteristics

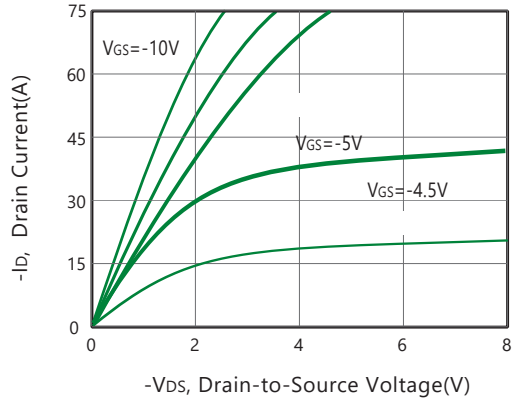


Figure 2. Body Diode Forward Voltage Variation with Source Current

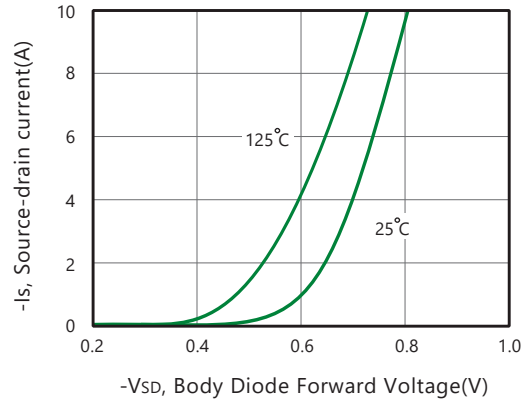


Figure 3. On-Resistance vs. Gate-Source Voltage

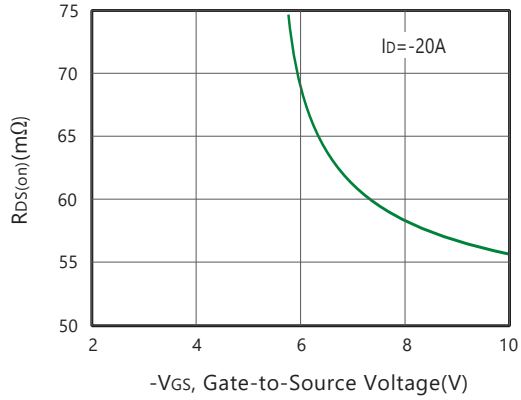


Figure 4. On-Resistance Variation with Drain Current and Temperature

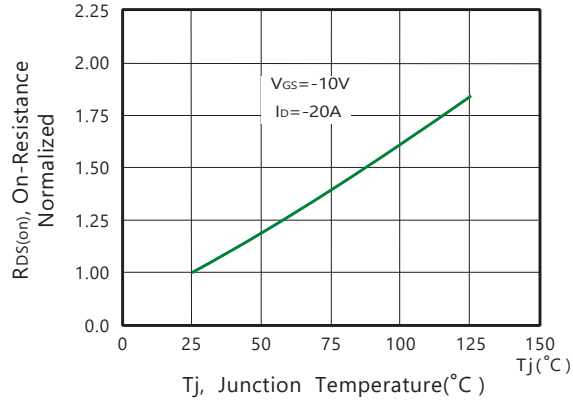


Figure 5. Gate Threshold Variation with Temperature

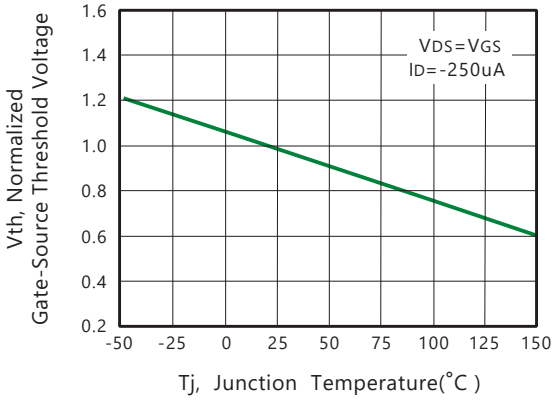


Figure 6. Gate Charge

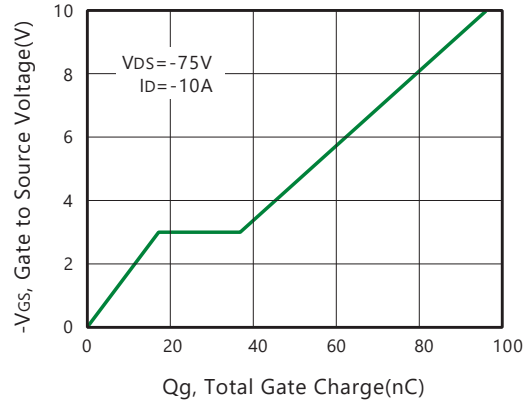


Figure 7. Capacitance

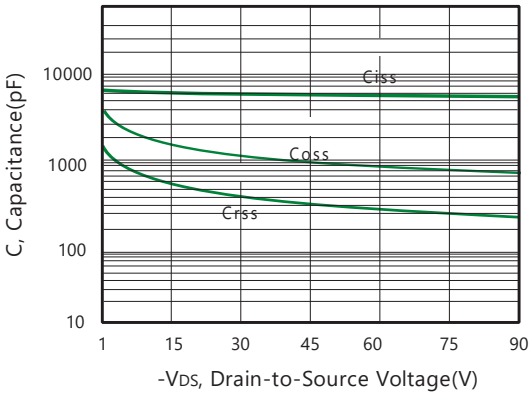
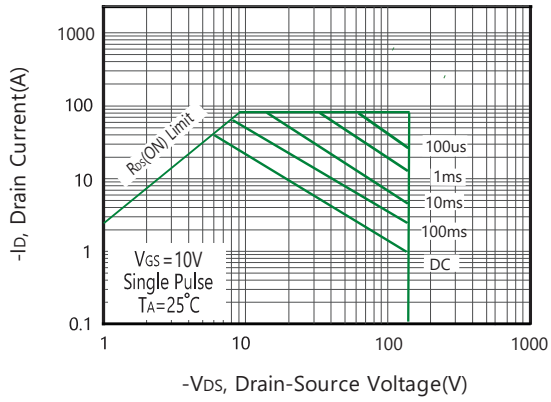


Figure 8. Maximum Safe Operating Area



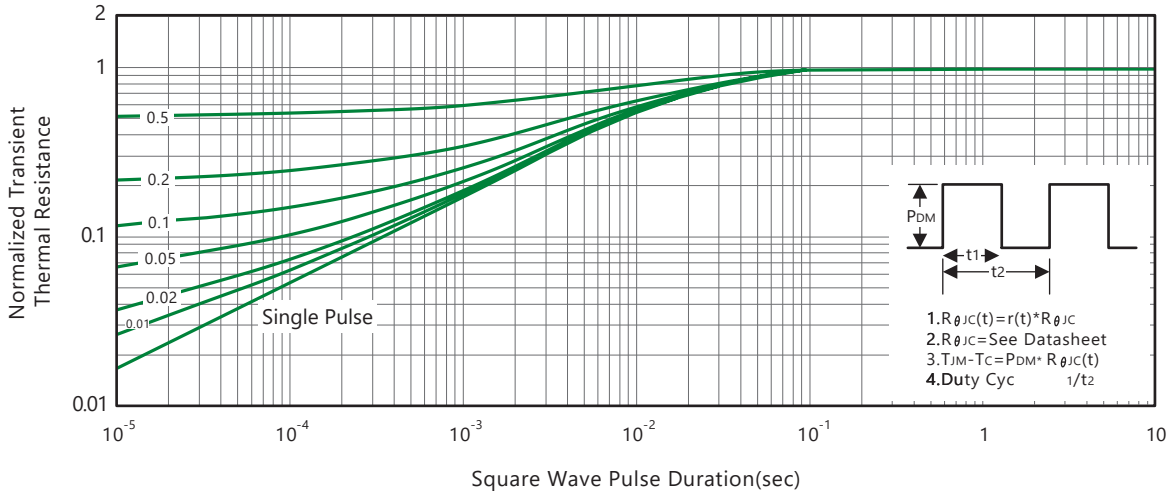


Figure 9. Normalized Thermal Transient Impedance Curve

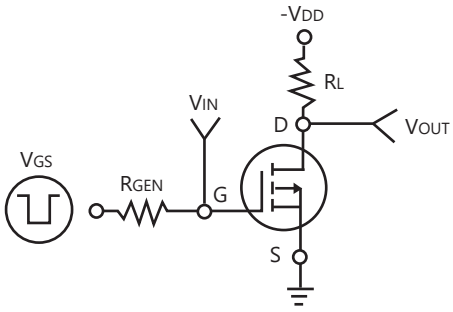


Figure 10a. Switching Test Circuit

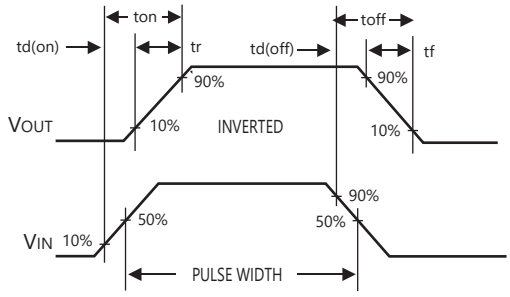
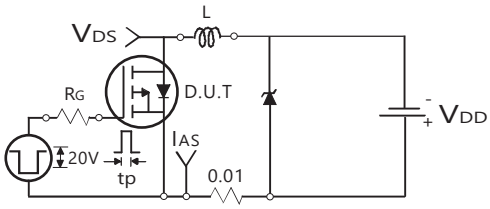
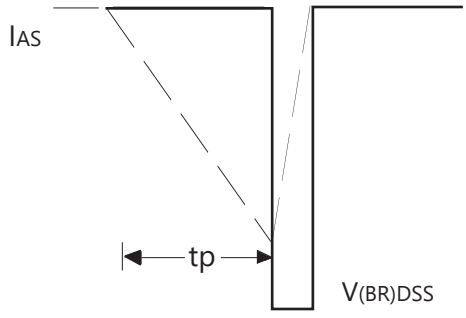


Figure 10b. Switching Waveforms



Unclamped Inductive Test Circuit

Figure 11a.



Unclamped Inductive Waveforms

Figure 11b.

PACKAGE OUTLINE DIMENSIONS

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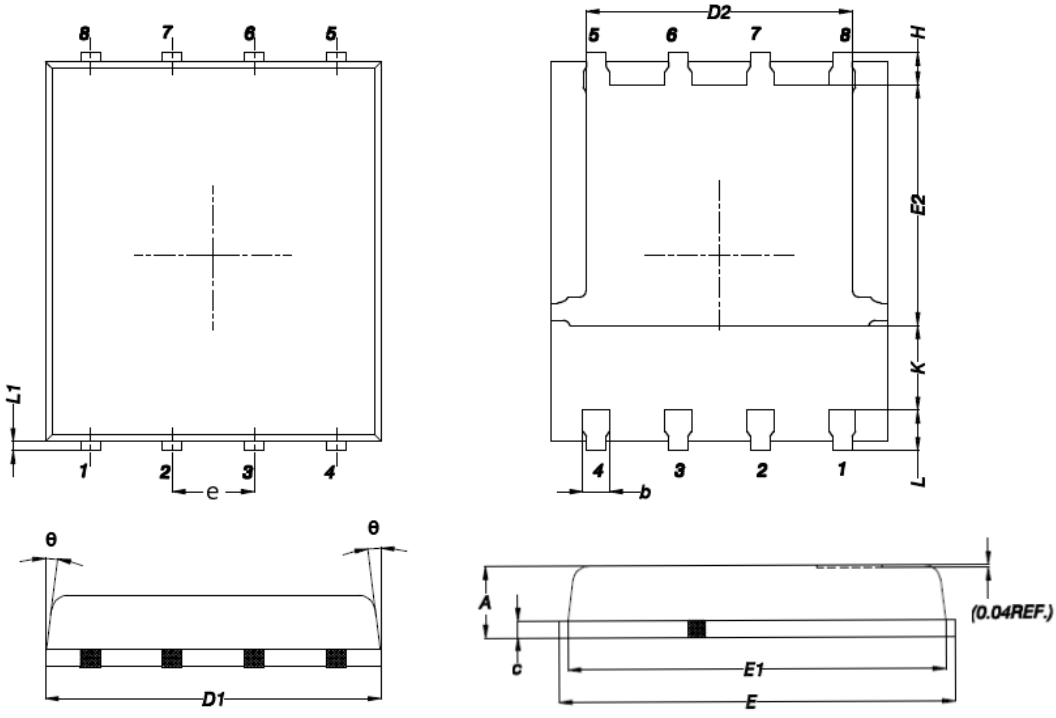

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	1.200	0.850	0.047	0.031
b	0.510	0.300	0.020	0.012
C	0.300	0.200	0.012	0.008
D1	5.400	4.800	0.212	0.189
D2	4.310	3.610	0.170	0.142
E	6.300	5.850	0.248	0.230
E1	5.960	5.450	0.235	0.215
E2	3.920	3.300	0.154	0.130
e	1.27BSC		0.05BSC	
H	0.650	0.380	0.026	0.015
K	---	1.100	---	0.043
L	0.710	0.380	0.028	0.015
L1	0.250	0.050	0.009	0.002
θ	12°	0°	12°	0°