V_{DSS}	60 V
I_D	50 A
$R_{DS(ON)}$	8.8 mΩ

Features

VDS = 60 V,ID = 50 A
Ultra-low RDS(ON): 8.8 mΩ (typ) @ VGS=10V
Low RDS(ON): <17 mΩ @ VGS=4.5V
Split Gate Trench technology
100% UIS & ΔVDS tested
RoHS compliant

Application

DC-DC Converters
Power management
Industrial and motor drives

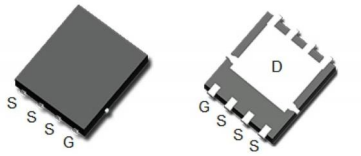
GK XXX
50N06NF

LOGO — GK XXX — CODE

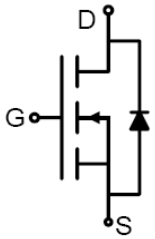
50N06NF

ID — VDSS

PDFN5X6-8L top&bottom view



Equivalent Circuit



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings (T_C=25℃ unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-source Voltage		V_{DS}	60	V
Gate-source Voltage		V_{GS}	±20	V
Drain Current (Silicon limited)	Tc=25℃	I_D	50	A
	Tc=100℃		15	
Pulsed Drain Current [A]		I_{DM}	200	A
Avalanche energy [B]		E_{AS}	66	mJ
Total Power Dissipation [C]	Tc=25℃	P_D	83	W
	Tc=100℃		28	
Junction and Storage Temperature Range		T_J ,T_{STG}	-55～+150	℃

Parameter		Symbol	Typ	Max	Units
Thermal Resistance Junction-to-Ambient [D]	t≤10S	$R_{\theta JA}$	10	12	℃/W
Thermal Resistance Junction-to-Ambient [D]	Steady-State		20	30	
Thermal Resistance Junction-to-Case	Steady-State	$R_{\theta JC}$	1.3	1.8	

Electrical Characteristics (T_J=25℃unless otherwise noted)

Parameter	Symbol	Conditions		Min	Typ	Max	Units
Static Parameter							
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}= 0V, I_D=250μA		60			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=60V,V_{GS}=0V	T_J=25℃			1	μA
			T_J=55℃			5	
Gate-Body Leakage Current	I_{GSS}	V_{GS}= ±20V, V_{DS}=0V				±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=250μA		1.0		3.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}= 10V, I_D=20A			8.8	11	mΩ
		V_{GS}= 4.5V, I_D=10A			12	17	
Diode Forward Voltage	V_{SD}	I_S=20A,V_{GS}=0V			0.85	1.3	V
Maximum Body-Diode Continuous Current	I_S					50	A
Dynamic Parameters							
Input Capacitance	C_{iss}	V_{DS}=35V,V_{GS}=0V,f=1MHZ			1072		pF
Output Capacitance	C_{oss}				192		
Reverse Transfer Capacitance	C_{rss}				8		
Gate Resistance	R_g	f=1MHZ, Open drain			1.6		Ω
Switching Parameters							
Total Gate Charge	Q_g(10V)	V_{DS}=30V,I_D=20A			34		nC
Total Gate Charge	Q_g(4.5V)				15.8		
Gate-Source Charge	Q_{gs}				7.8		
Gate-Drain Charge	Q_{gd}				5.2		
Reverse Recovery Charge	Q_{rr}	I_F=20A, di/dt=200A/us			36		
Reverse Recovery Time	t_{rr}				27		ns
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=10V,V_{DD}=30V,I_D=12A R_{GEN}=3Ω			10		
Turn-on Rise Time	t_r				36		
Turn-off Delay Time	$t_{D(off)}$				30		
Turn-off fall Time	t_f				57		

A. Repetitive rating; pulse width limited by max. junction temperature.
B. V_{DD}=50V, R_G=25Ω, L=1mH, I_{AS}=18A,.
C. Pd is based on max. junction temperature, using junction-case thermal resistance.
D. 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 Power dissipation P_{DSM} is based on $R_{\theta JA}$ t≤ 10s and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.

RATING AND CHARACTERISTIC CURVES

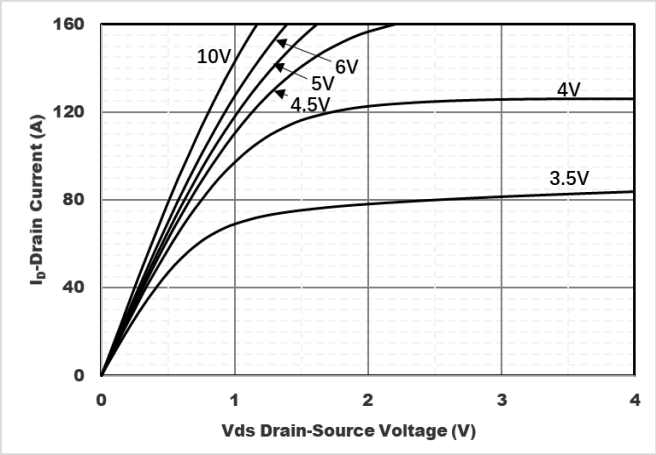


Figure1. Output Characteristics

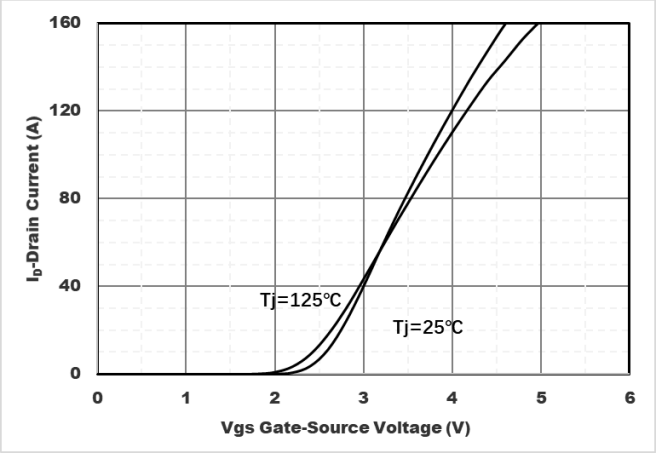


Figure2. Transfer Characteristics

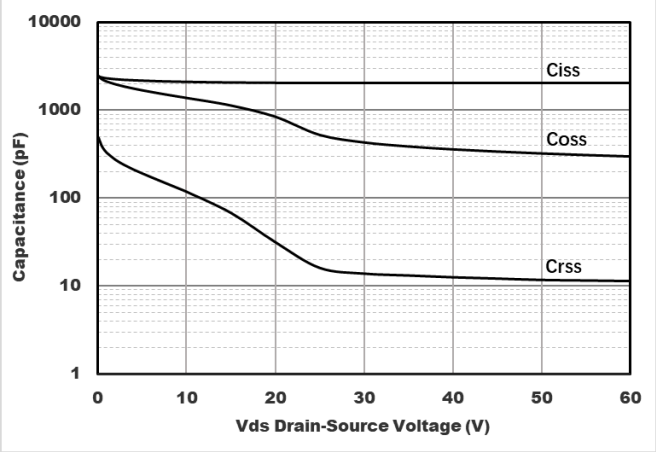


Figure3. Capacitance Characteristics

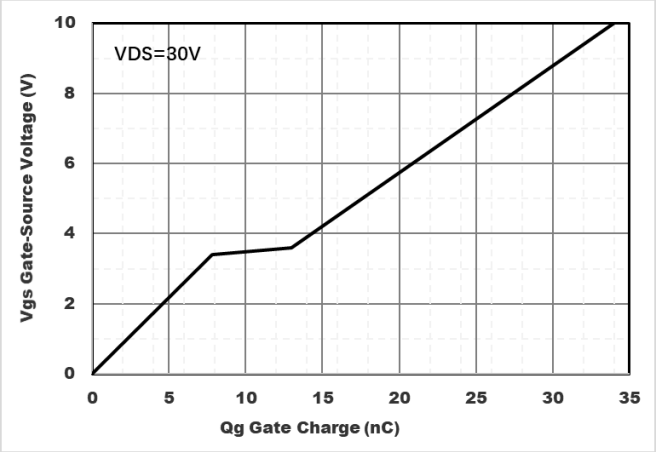


Figure4. Gate Charge

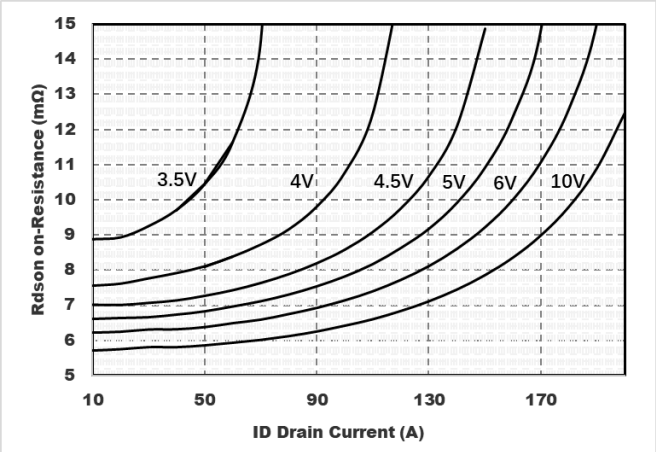


Figure5. Drain-Source on Resistance

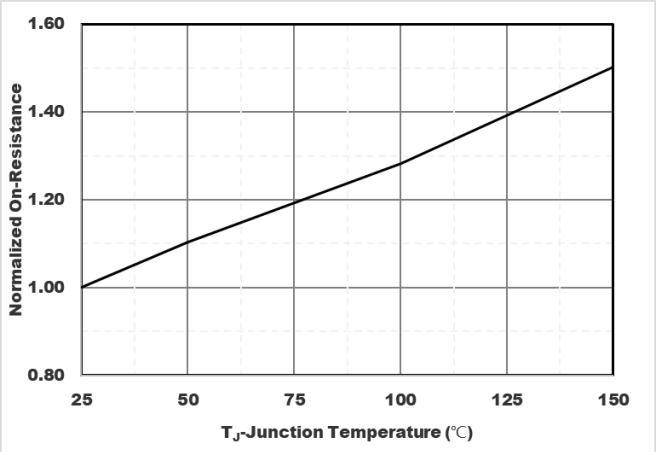


Figure6. Normalized On-Resistance

RATING AND CHARACTERISTIC CURVES

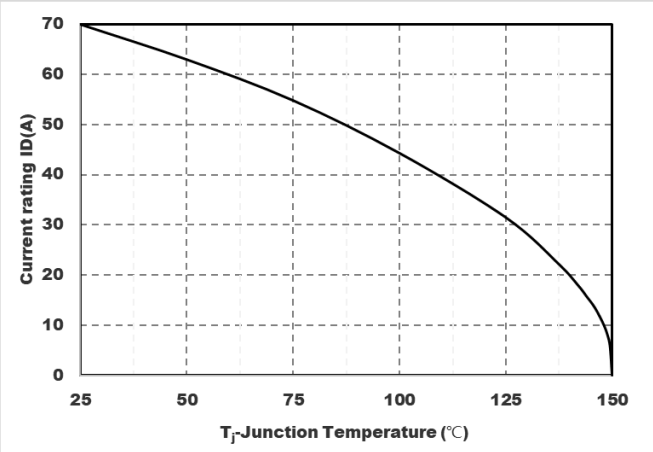


Figure7. Drain current

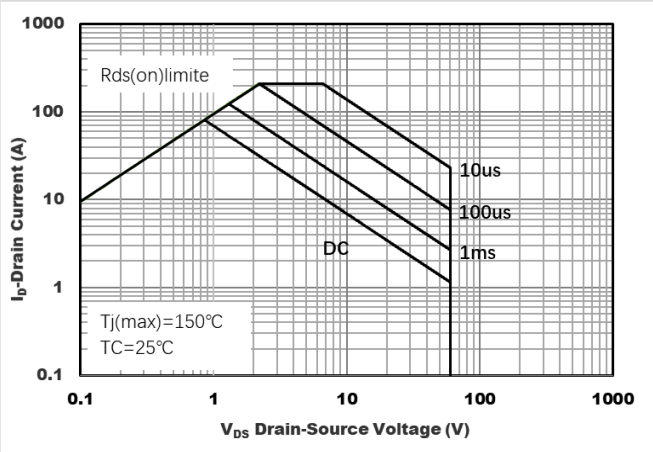


Figure8. Safe Operation Area

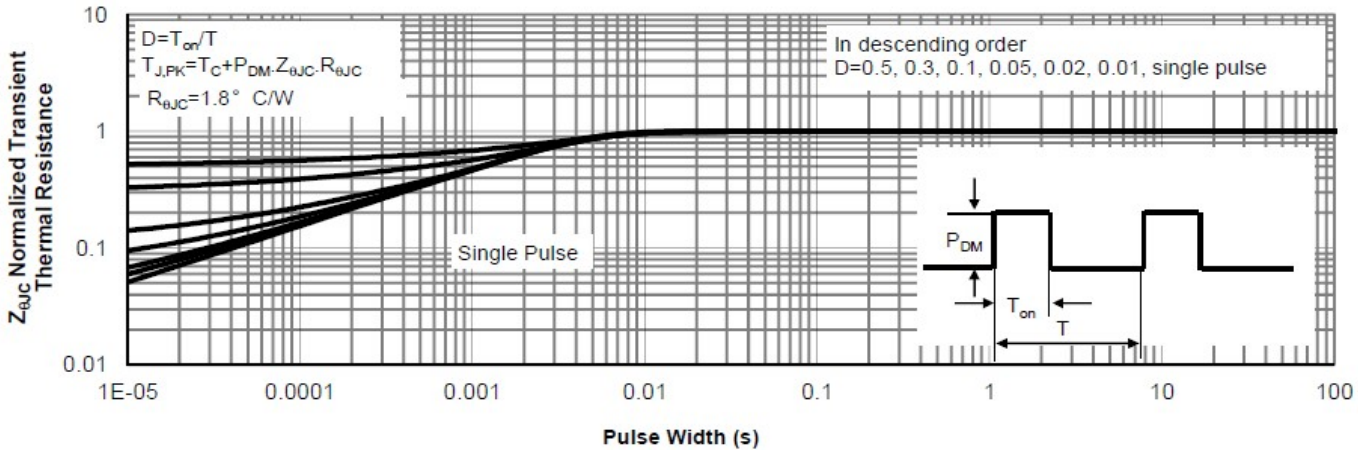
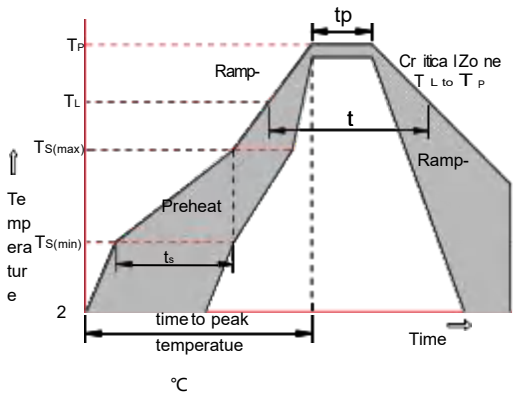


Figure8. Normalized Maximum Transient Thermal Impedance

Soldering parameters

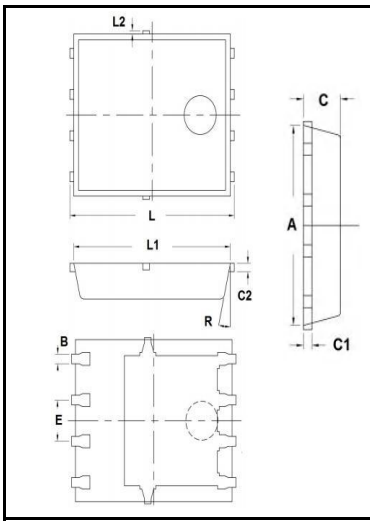
Reflow Condition		Pb-Free assembly (see as bellow)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150℃
	-Temperature Max($T_{s(max)}$)	+200℃
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3℃/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3℃/sec. Max
Reflow	-Temperature(T_L)(Liquid us)	+217℃
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_p)		+260(+0/-5)℃
Time within 5℃ of actual Peak Temp (t_p)		30 secs. Max
Ramp-down Rate		6℃/sec. Max
Time 25℃ to Peak Temp (T_P)		8 min. Max
Do not exceed		+260℃

FIG5: Reflow condition



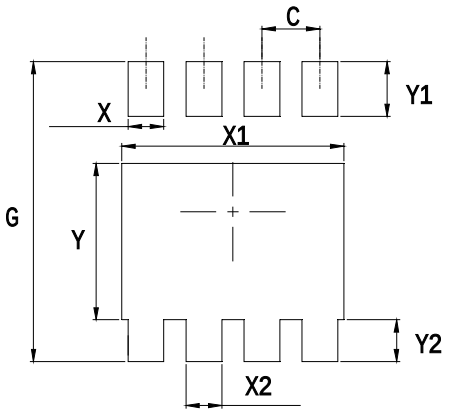
Package Dimensions & Suggested Pad Layout

PDFN5*6



Dim.	Min.	Max.
A	4.8	5.2
B	0.25	0.35
C	1	1.2
C1	Typ0.254	
C2	Typ0.254	
E	Typ1.27	
L	6	6.3
L1	5.7	6
L2	Max0.2	
R	Typ13°	

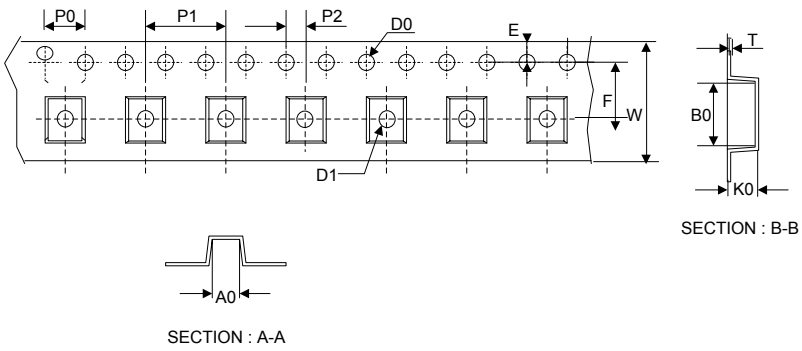
All Dimensions in millimeter



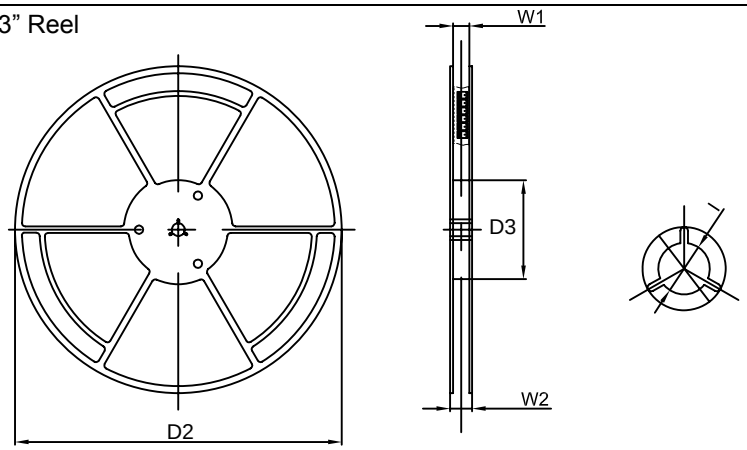
Dimensions	Value (in mm)
C	1.27
G	6.45
X	0.62
X1	4.50
X2	0.62
Y	3.70
Y1	1.05
Y2	0.80

Tape & rell specification

Tape



13” Reel



Symbol	Dimension (mm)
P0	4.00±0.20
P1	8.00±0.20
P2	2.00±0.20
D0	1.55±0.20
D1	1.55±0.20
E	1.75±0.20
F	5.50±0.20
W	12.00±0.20
A0	6.60±0.20
B0	5.70±0.20
K0	1.30±0.20
T	0.20±0.20
D2	330.0±5.0
D3	100.0±4.0
W1	12.0±5.0
W2	14.0±5.0
I	13.0±2.0

Quantity: 5000PCS

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