18N65F

N-Channel Enhancement Mode MOSFET

V_{DSS}	650 V
I_D	18 A
$R_{DS(ON)}$	0.41 Ω

FEATURES

- $R_{DS(ON)}$ = 0.41Ω (Typ.) @ V_{GS} = 10V, I_D =9A
- Fast Switching
- Improved dv/dt Capability
- 100% Avalanche Tested

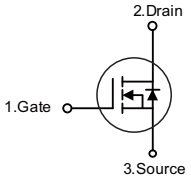


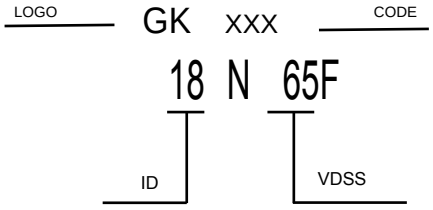
ITO-220AB



APPLICATION

- Switch Mode Power Supply(SMPS)
- Uninterruptible Power Supply(UPS)
- Power Factor Correction (PFC)





MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (T_C=25°C Unless Otherwise Noted)				
V_{DSS}	Drain-Source Voltage		650	V
V_{GSS}	Gate-Source Voltage		±30	
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-55 to 150	°C
I_S	Diode Continuous Forward Current	T_C=25°C	18	A
Mounted on Large Heat Sink				
I_{DP} ①	300μs Pulse Drain Current Tested	T_C=25°C	72	A
I_D ②	Continuous Drain Current(V_{GS}=10V)	T_C=25°C	18	A
		T_C=100°C	11.5	
P_D	Maximum Power Dissipation	T_C=25°C	260	W
		T_C=100°C	104	
$R_{\theta JC}$	Thermal Resistance-Junction to Case		0.48	°C/W
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient		62.5	°C/W
Drain-Source Avalanche Ratings				
E_{AS} ③	Avalanche Energy, Single Pulsed		500	mJ

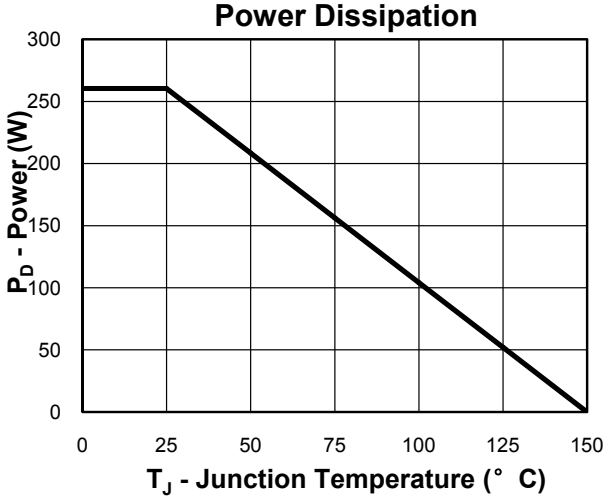
Electrical Characteristics (T_C=25℃ unless otherwise specified)

Symbol	Parameter	Test Condition	18N65F			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=250μA	650			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=650V, V_{GS}=0V			1	μA
		T_J=125°C			30	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250μA	3		5	V
I_{GSS}	Gate Leakage Current	V_{GS}=±30V, V_{DS}=0V			±100	nA
$R_{DS(ON)}$④	Drain-Source On-state Resistance	V_{GS}=10V, I_{DS}=10A		410	500	mΩ
Diode Characteristics						
V_{SD}④	Diode Forward Voltage	I_{SD}=10A, V_{GS}=0V			1.2	V
t_{rr}	Reverse Recovery Time	I_{SD}=18A, dI_{SD}/dt=100A/μs		560		ns
Q_{rr}	Reverse Recovery Charge			4.3		μC
Dynamic Characteristics⑤						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz		2.8		Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=300V, Frequency=1.0MHz		4350		pF
C_{oss}	Output Capacitance			410		
C_{rss}	Reverse Transfer Capacitance			110		
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=300V, R_L=100Ω, I_{DS}=18A, V_{GEN}=10V, R_G=4.7Ω		47		ns
t_r	Turn-on Rise Time			81		
$t_{d(OFF)}$	Turn-off Delay Time			95		
t_f	Turn-off Fall Time			52		
Gate Charge Characteristics⑤						
Q_g	Total Gate Charge	V_{DS}=520V, V_{GS}=10V, I_{DS}=18A		128		nC
Q_{gs}	Gate-Source Charge			43		
Q_{gd}	Gate-Drain Charge			52		

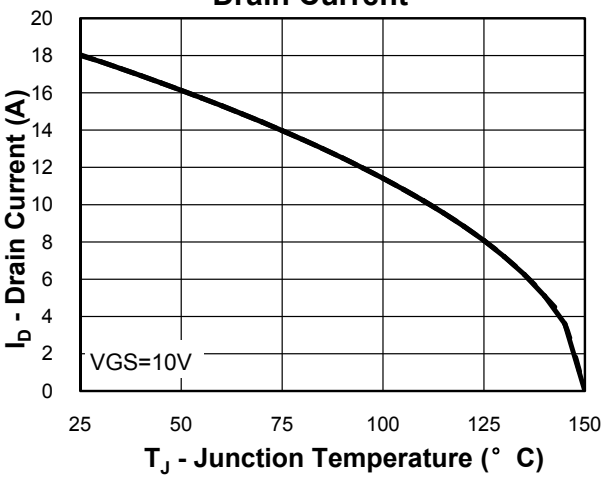
Notes: ①Pulse width limited by safe operating area.
②Calculated continuous current based on maximum allowable junction temperature.
③Limited by T_{Jmax}, I_{AS} =10A, V_{DD} = 100V, R_G = 50Ω , Starting T_J = 25°C.
④Pulse test;Pulse width≤300μs, duty cycle≤2%.
⑤Guaranteed by design, not subject to production testing.

RATING AND CHARACTERISTIC CURVES

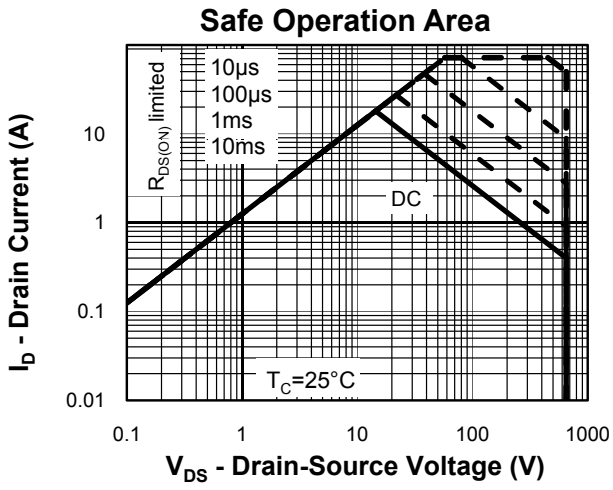
Power Dissipation



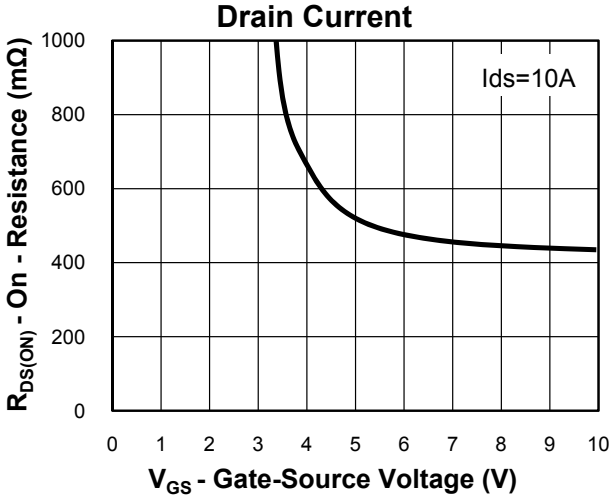
Drain Current



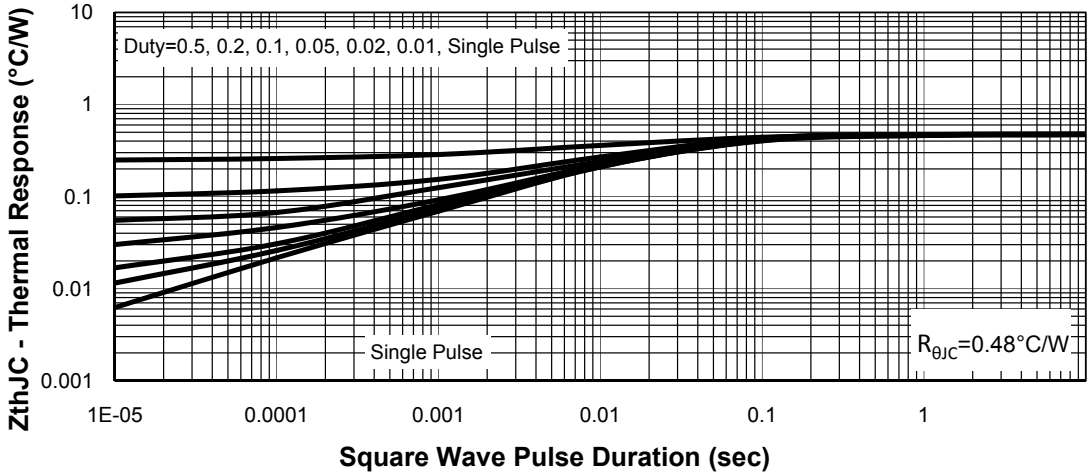
Safe Operation Area



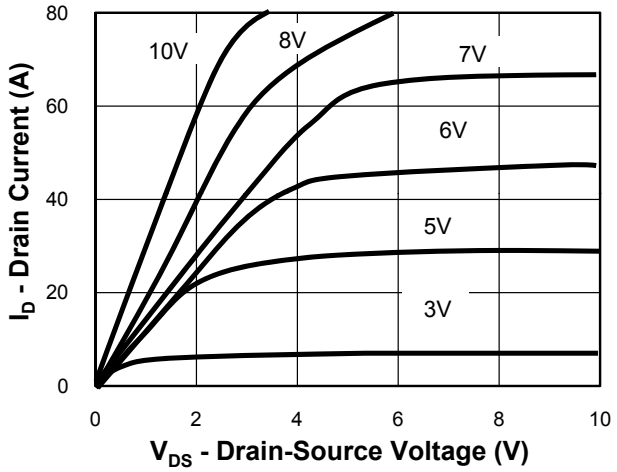
Drain Current

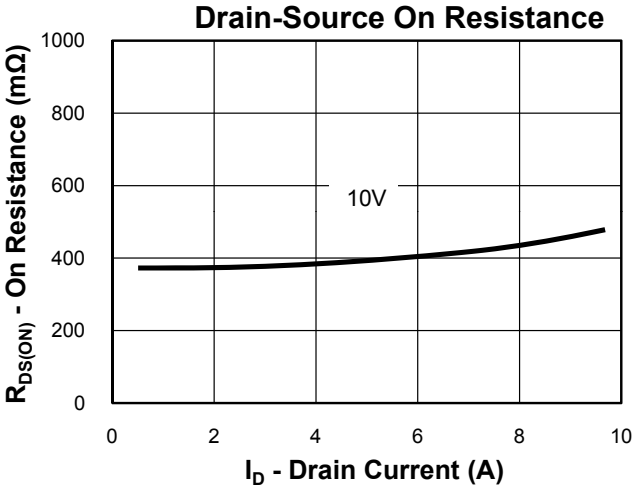


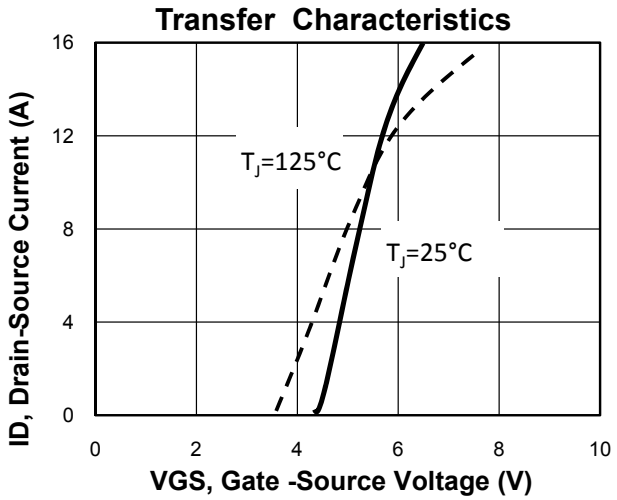
Thermal Transient Impedance

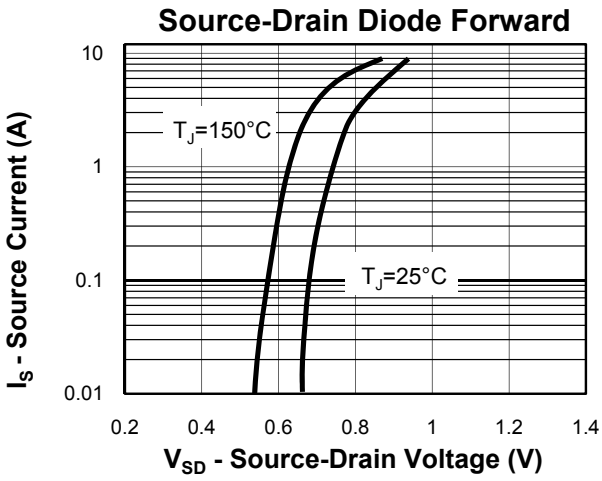


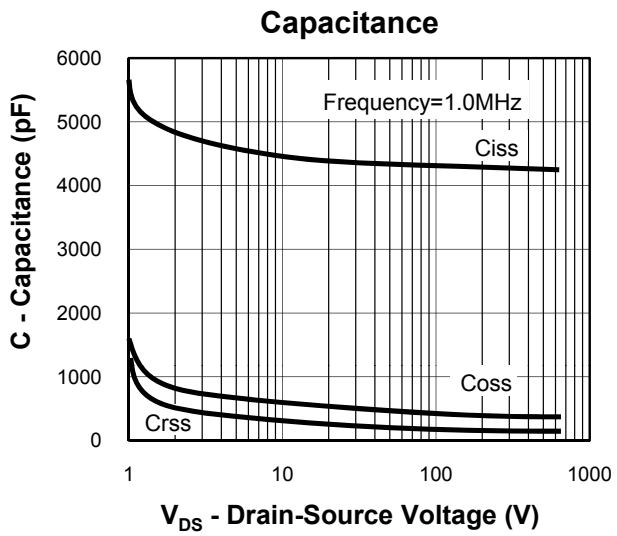
RATING AND CHARACTERISTIC CURVES

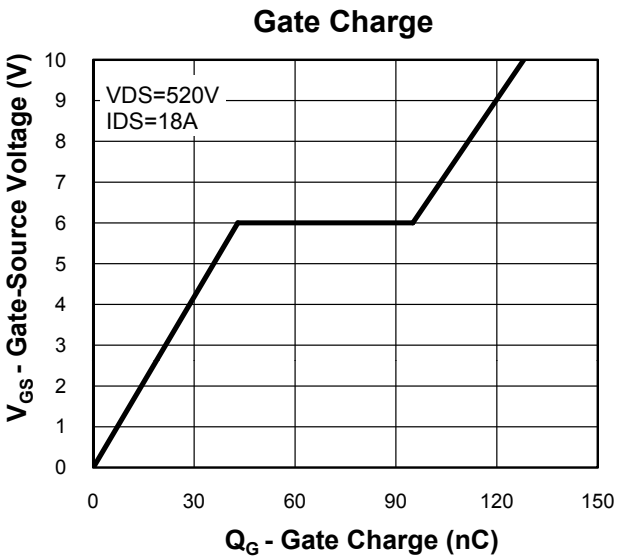








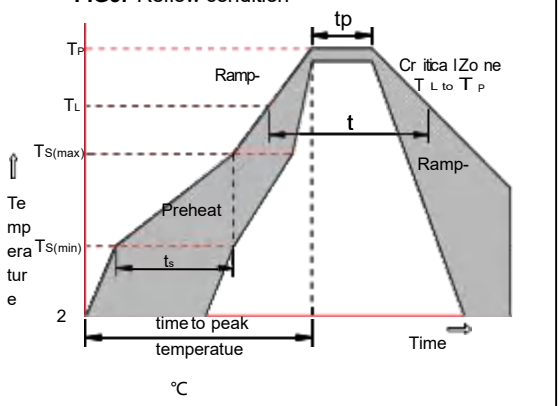




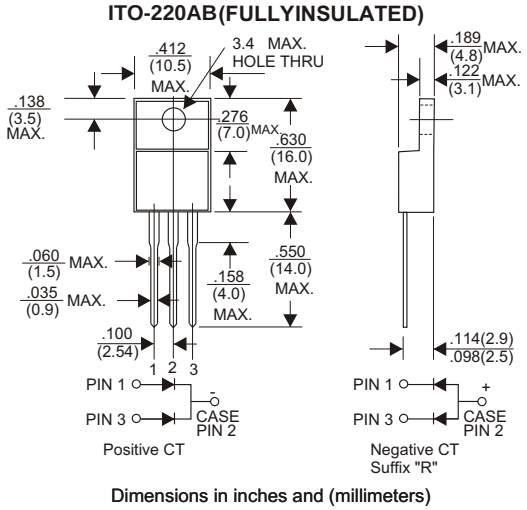
Soldering parameters

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



Dimensions in inches and (millimeters)