16N65F

N-Channel Enhancement Mode MOSFET

V_{DSS}	650 V
I_D	16 A
$R_{DS(ON)}$	0.48 Ω

FEATURES

- 650V,16A
- $R_{DS(ON)}$ = 0.48Ω (Typ.) @ V_{GS} = 10V, I_D =8A
- Fast Switching
- Improved dv/dt Capability
- 100% Avalanche Tested

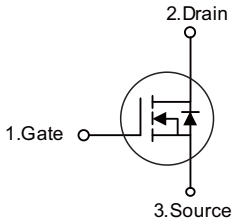


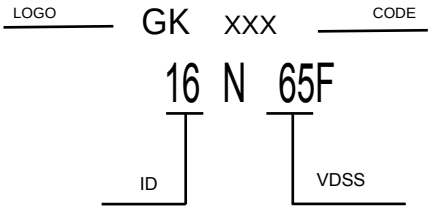
ITO-220AB



APPLICATION

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





MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

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

Symbol	Parameter		Max.	Units
V_{DSS}	Drain-Source Voltage		650	V
V_{GSS}	Gate-Source Voltage		±30	V
I_D	Continuous Drain Current	T_C = 25℃	16	A
		T_C = 100℃	10	A
I_{DM}	Pulsed Drain Current note1		64	A
E_{AS}	Single Pulsed Avalanche Energy note2		461	mJ
P_D	Power Dissipation	T_C = 25℃	98	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		1.3	℃/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient		62.5	℃/W
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +150	℃

Electrical Characteristics (T_J=25℃ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	650	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=650V, V_{GS}=0V, T_J=25℃	-	-	1	μA
I_{GSS}	Gate to Body Leakage Current	V_{DS}=0V, V_{GS}= ±30V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	2	3	4	V
$R_{DS(on)}$	Static Drain-Source on-Resistance note3	V_{GS} =10V, I_D =8A	-	0.48	0.55	Ω
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=25V, V_{GS}=0V, f=1.0MHz	-	2740	-	pF
C_{oss}	Output Capacitance		-	214	-	pF
C_{rss}	Reverse Transfer Capacitance		-	15	-	pF
Q_g	Total Gate Charge	V_{DD}=520V, I_D=16A, V_{GS}=10V	-	71	-	nC
Q_{gs}	Gate-Source Charge		-	10	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	32	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=325V, I_D=16A, R_G=25Ω	-	35	-	ns
t_r	Turn-on Rise Time		-	50	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	160	-	ns
t_f	Turn-off Fall Time		-	65	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	16	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	64	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS}=0V, I_{SD}=16A	-	-	1.4	V
t_{rr}	Reverse Recovery Time	V_{GS}=0V, I_S=16A, di/dt=100A/μs	-	430	-	ns
Q_{rr}	Reverse Recovery Charge		-	6.5	-	μC

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition: T_J = 25°C, V_{DD} = 80V, V_G = 10V, L= 10mH, I_{AS} = 9.6A

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤1%

RATING AND CHARACTERISTIC CURVES

Figure1: Output Characteristics

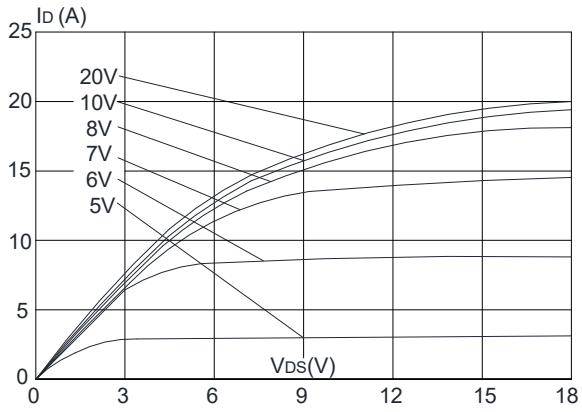


Figure 2: Typical Transfer Characteristics

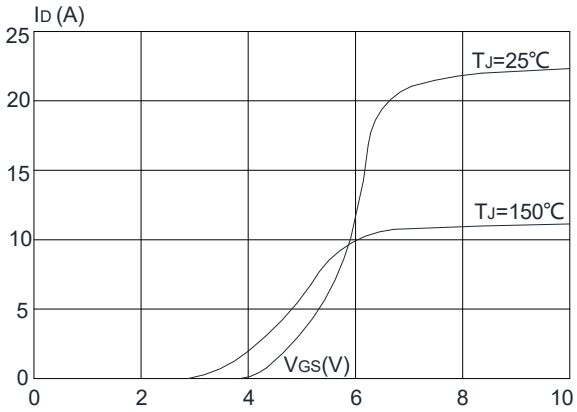


Figure 3: On-resistance vs. Drain Current

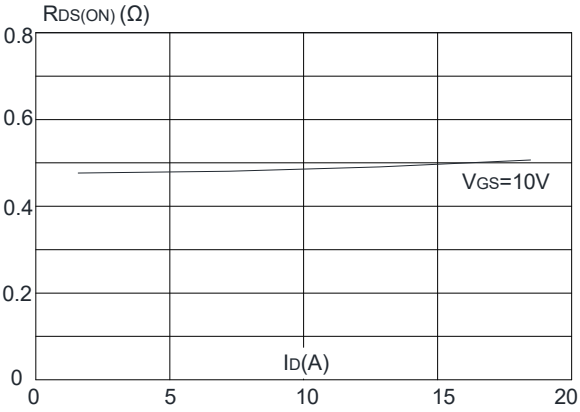


Figure 4: Body Diode Characteristics

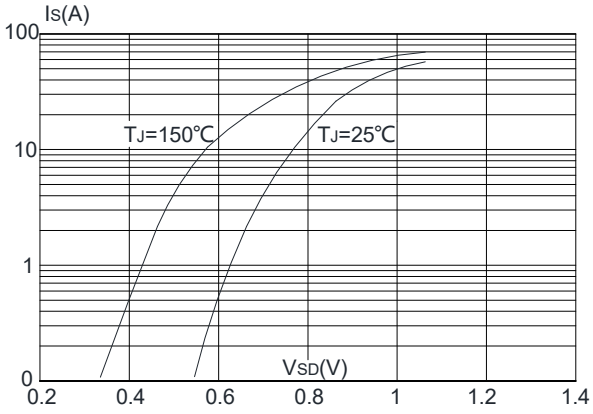


Figure 5: Gate Charge Characteristics

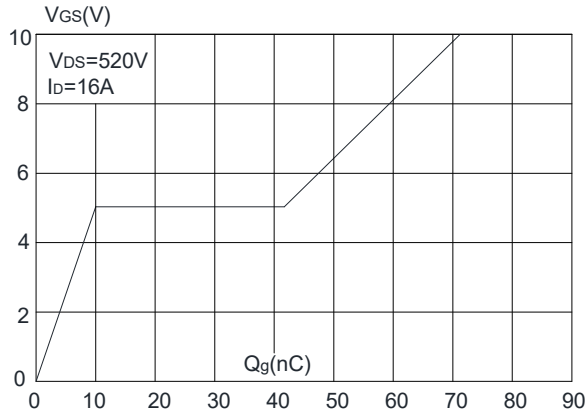
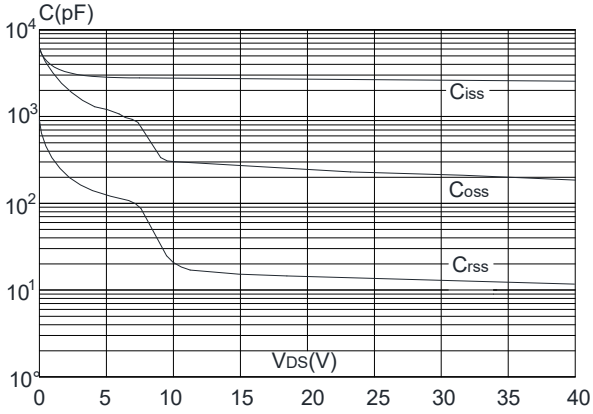


Figure 6: Capacitance Characteristics



RATING AND CHARACTERISTIC CURVES

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

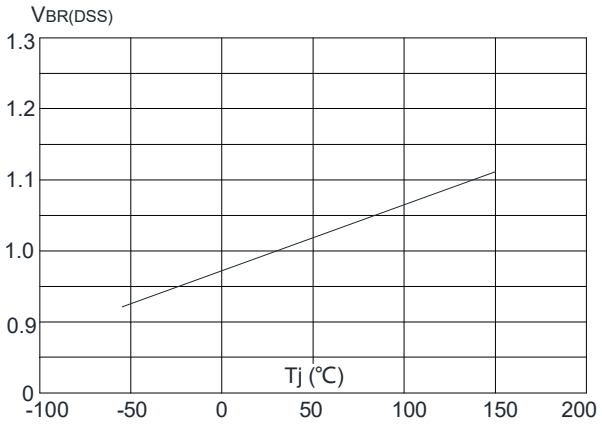


Figure 8: Normalized on Resistance vs. Junction Temperature

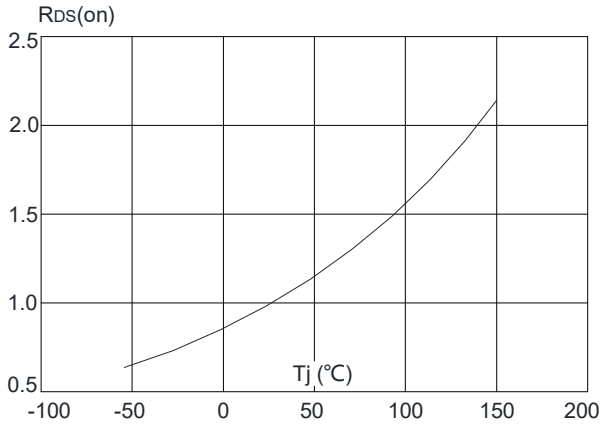


Figure 9: Maximum Safe Operating Area

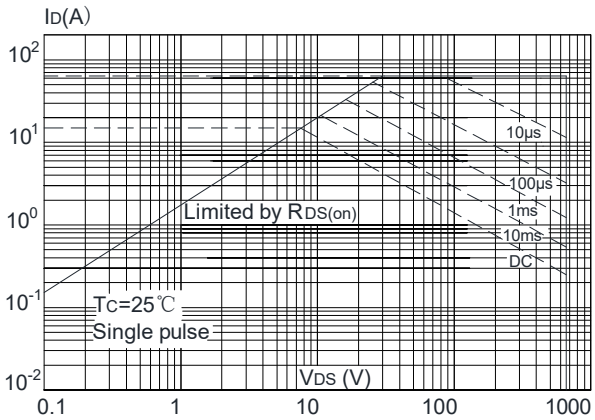


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

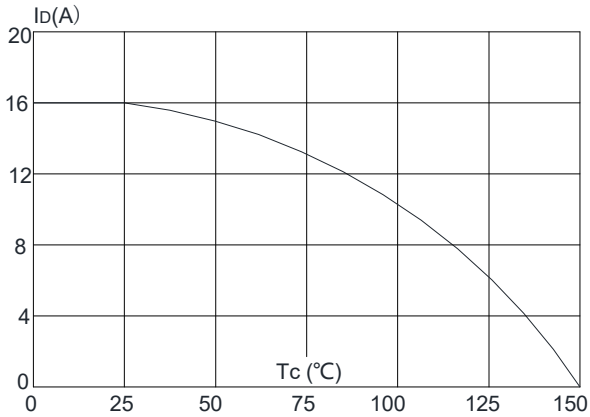
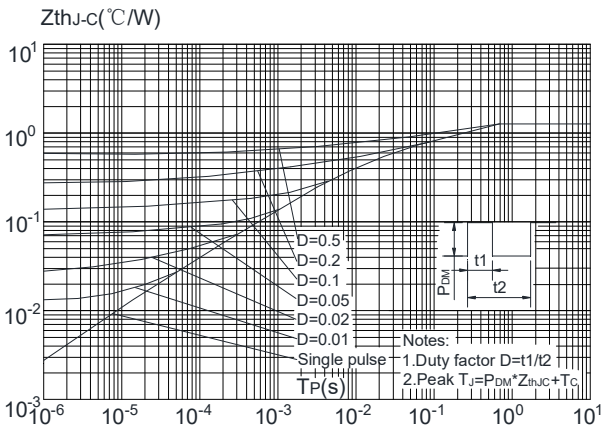


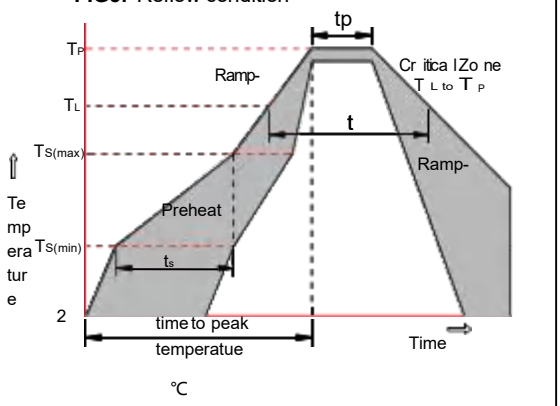
Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



Soldering parameters

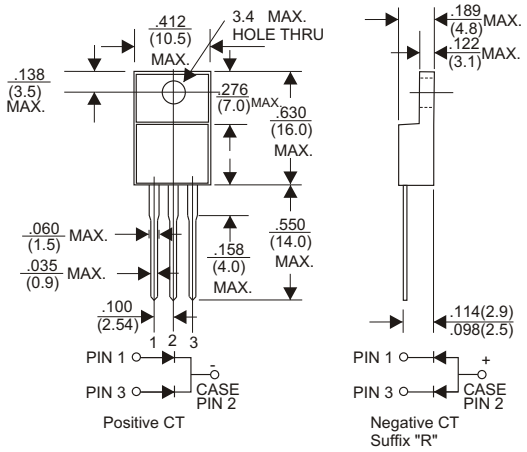
Reflow Condition		Pb-Free assembly (see as bellow)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150℃
	-Temperature Max($T_{s(max)}$)	+200℃
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3℃/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3℃/sec. Max
Reflow	-Temperature(T_L)(Liquid 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

ITO-220AB(FULLYINSULATED)



Dimensions in inches and (millimeters)

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