

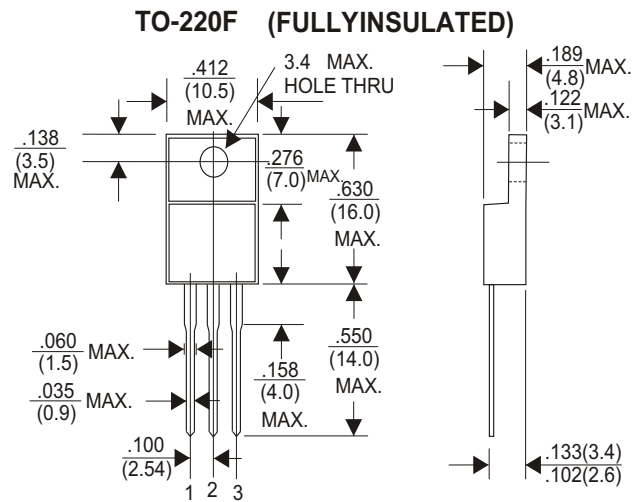
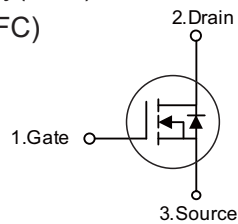


### Features

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

### Application

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



### Absolute Maximum Ratings ( $T_C=25^\circ\text{C}$ unless otherwise specified)

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

# 16N65F

## Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
<b>Off Characteristic</b>						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	650	-	-	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =650V, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C	-	-	1	μA
I <sub>GSS</sub>	Gate to Body Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> = ±30V	-	-	±100	nA
<b>On Characteristics</b>						
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	2	3	4	V
R <sub>DS(on)</sub>	Static Drain-Source on-Resistance <small>note3</small>	V <sub>GS</sub> =10V, I <sub>D</sub> =8A	-	0.48	0.55	Ω
<b>Dynamic Characteristics</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1.0MHz	-	2740	-	pF
C <sub>oss</sub>	Output Capacitance		-	214	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		-	15	-	pF
Q <sub>g</sub>	Total Gate Charge	V <sub>DD</sub> =520V, I <sub>D</sub> =16A, V <sub>GS</sub> =10V	-	71	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	10	-	nC
Q <sub>gd</sub>	Gate-Drain("Miller") Charge		-	32	-	nC
<b>Switching Characteristics</b>						
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DD</sub> =325V, I <sub>D</sub> =16A, R <sub>G</sub> =25Ω	-	35	-	ns
t <sub>r</sub>	Turn-on Rise Time		-	50	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time		-	160	-	ns
t <sub>f</sub>	Turn-off Fall Time		-	65	-	ns
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
I <sub>S</sub>	Maximum Continuous Drain to Source Diode Forward Current		-	-	16	A
I <sub>SM</sub>	Maximum Pulsed Drain to Source Diode Forward Current		-	-	64	A
V <sub>SD</sub>	Drain to Source Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>SD</sub> =16A	-	-	1.4	V
t <sub>rr</sub>	Reverse Recovery Time	V <sub>GS</sub> =0V, I <sub>S</sub> =16A, di/dt=100A/μs	-	430	-	ns
Q <sub>rr</sub>	Reverse Recovery Charge		-	6.5	-	μC

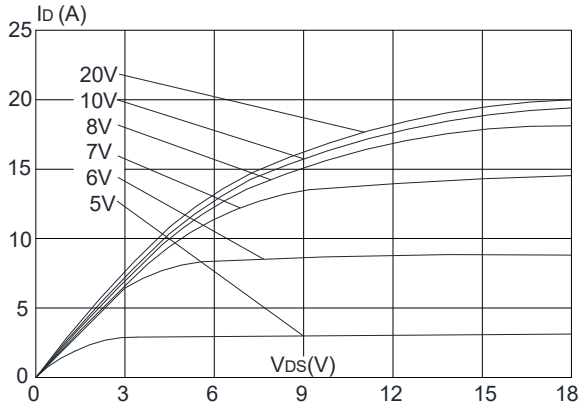
Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition: T<sub>J</sub> = 25°C, V<sub>DD</sub> = 80V, V<sub>G</sub> = 10V, L= 10mH, I<sub>AS</sub> = 9.6A

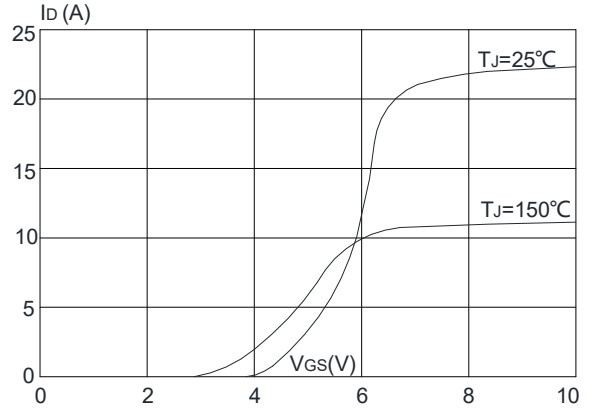
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤1%

## RATING AND CHARACTERISTIC CURVES (16N65F)

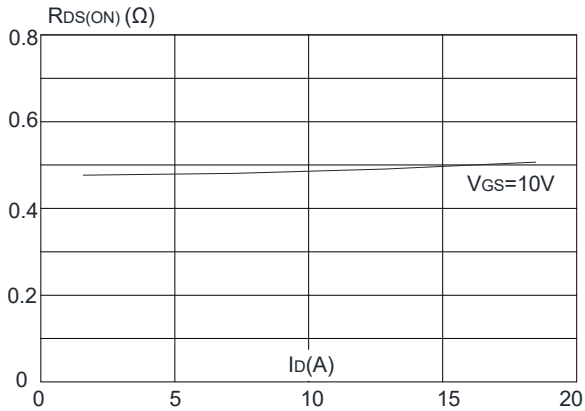
**Figure 1: Output Characteristics**



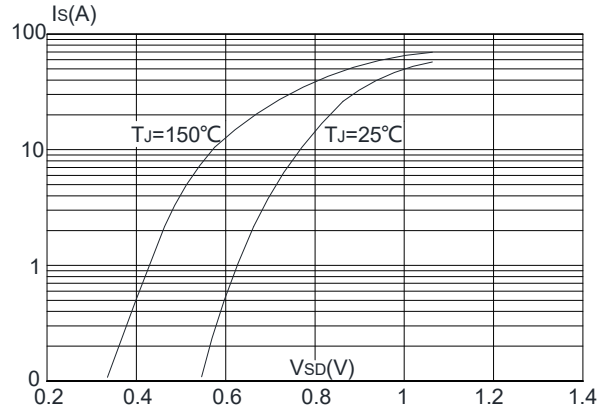
**Figure 2: Typical Transfer Characteristics**



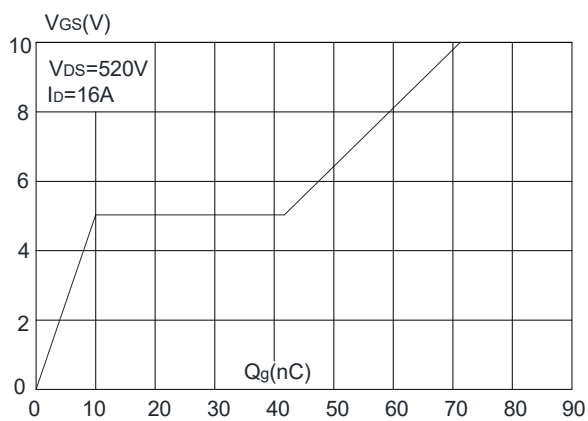
**Figure 3: On-resistance vs. Drain Current**



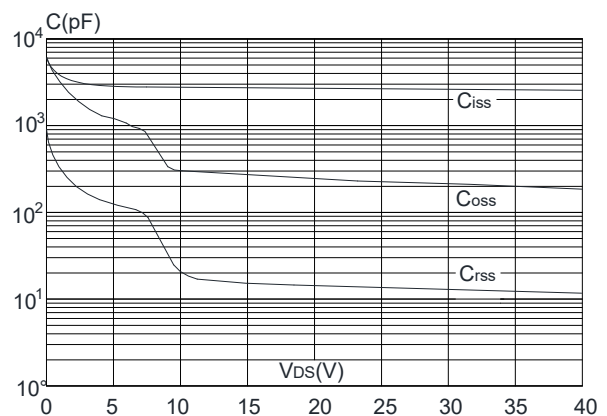
**Figure 4: Body Diode Characteristics**



**Figure 5: Gate Charge Characteristics**

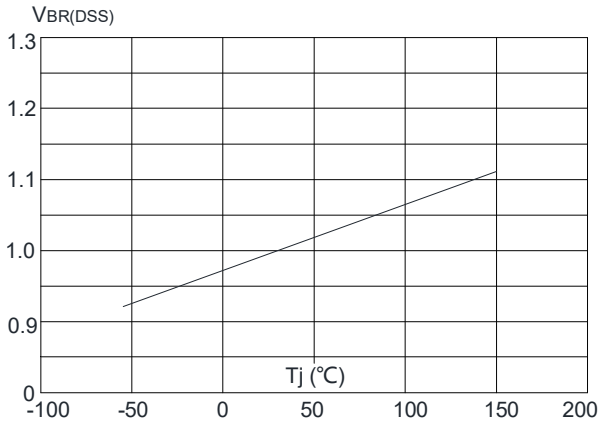


**Figure 6: Capacitance Characteristics**

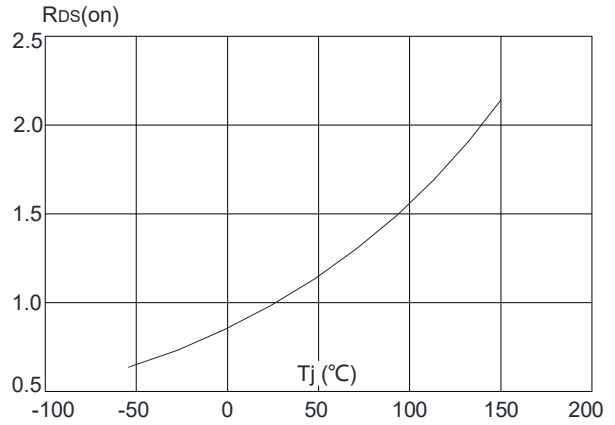


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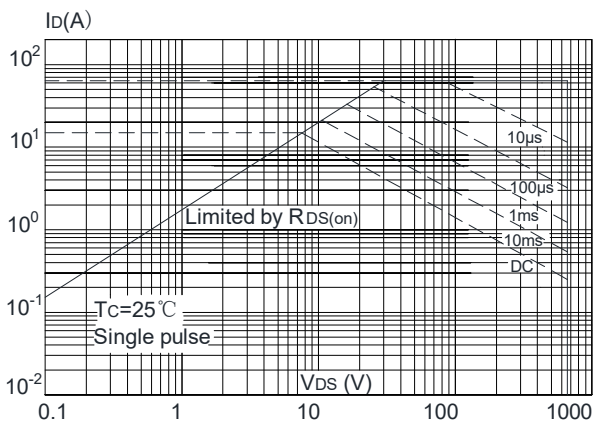
**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature



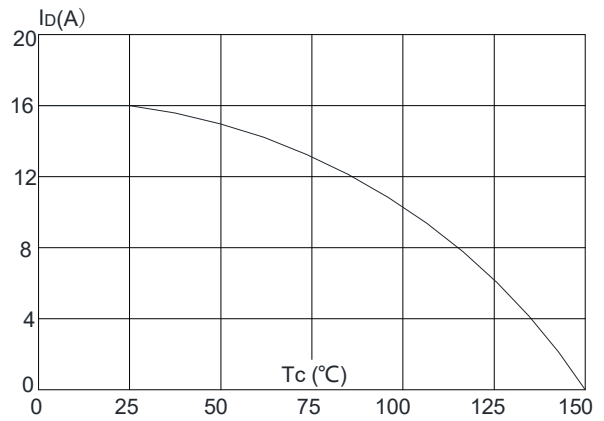
**Figure 8:** Normalized on Resistance vs. Junction Temperature



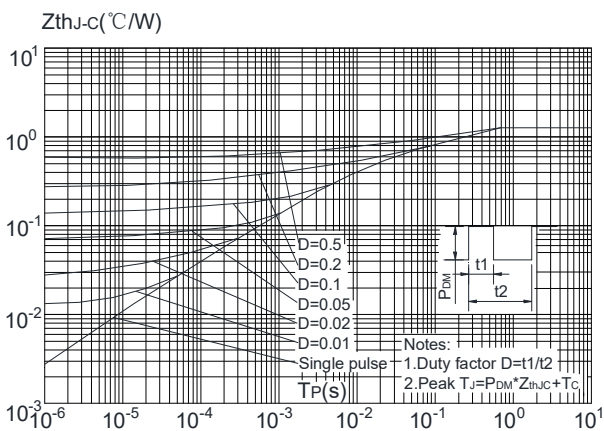
**Figure 9:** Maximum Safe Operating Area



**Figure 10:** Maximum Continuous Drain Current vs. Case Temperature



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



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