Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
650V	0.37Ω@10V	18A

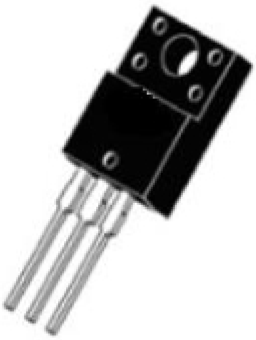
Feature

- Fast Switching
- Low Gate Charge and Rdson
- 100% Single Pulse avalanche energy Test

Applications

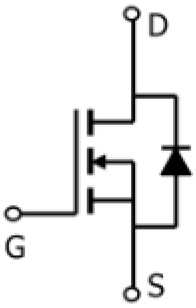
- DC-DC Converter
- Ideal for high-frequency switching and synchronous rectification

Package

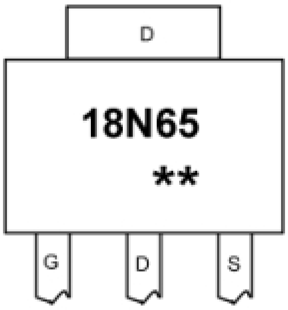


TO-220F(G:1 D:2 S:3)

Circuit diagram



Marking



18N65 =Device Code
** =Week Code

Absolute maximum ratings

(T_a=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	650	V
Gate-Source Voltage	V_{GS}	±30	V
Continuous Drain Current1(TC=25℃)	I_D	18	W
Pulsed Drain Current	I_{DM}	72	A
Single Pulse Avalanche Energy ^{3}	E_{AS}	500	mJ
Total Power Dissipation(TC=25℃)	P_D	60	W
Thermal Resistance Junction- Case^1	$R_{\theta JC}$	2.08	℃/ W
Storage Temperature Range	$T_{STG,}$	-55~ +150	℃
Operating Junction Temperature Range	$T_{J,}$	-55~ +150	℃

Electrical characteristics

(T_A=25℃, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	BV_{DSS}	V_{GS} = 0V, I_D =250μA	650			V
Drain-Source Leakage Current	I_{DSS}	V_{DS} =520V,V_{GS} = 0V , T_J=25℃			1	uA
Gate-body leakage current	I_{GSS}	V_{GS} =±30V , V_{DS}=0V			±100	uA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	3	4	5	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =9A		0.37	0.46	Ω
Dynamic characteristics[4]						
Input Capacitance	C_{iss}	V_{DS}=25V, V_{GS}=0V, f=1MHz		2931		pF
Output Capacitance	C_{oss}			217		
Reverse Transfer Capacitance	C_{rss}			25		
Switching Characteristics						
Total Gate Charge(4.5V)	Q_g	V_{DS}=640V, V_{GS}=10V, I_D=10A		64		nC
Gate-Source Charge	Q_{gS}			13		
Gate-Drain Charge	Q_{gd}			24		
Turn-On Delay Time	$T_{d(on)}$	V_{DD}=400V, V_{GS}=10V, R_G=4.7Ω, I_D=10A		19		nS
Rise Time	T_r			10		
Turn-Off Delay Time	$T_{d(off)}$			68		
Fall Time	T_f			23		

Note :

1. The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.
2. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3. The EAS data shows Max. rating . The test condition is R_G =30Ω ,L=10mH

Typical Characteristics

Figure 1. Maximum Effective Thermal Impedance, Junction-to-Case

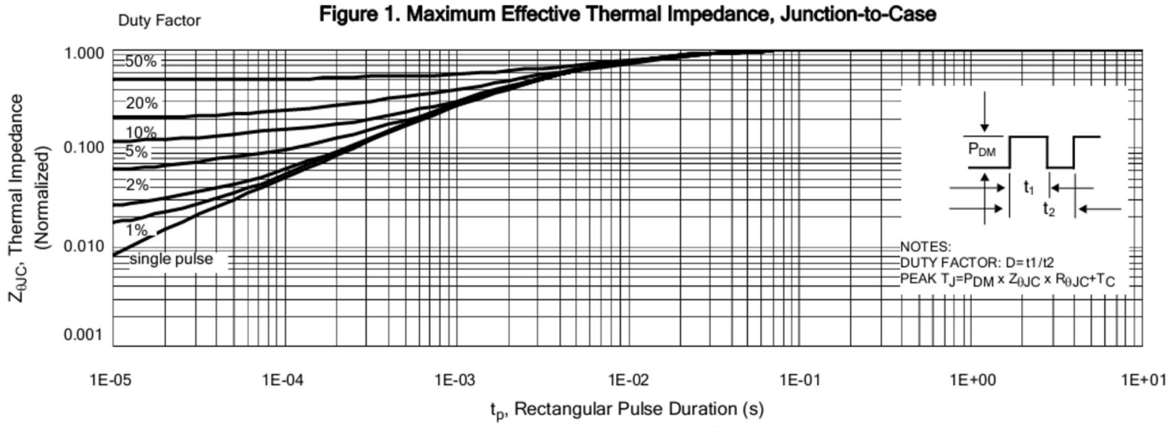


Figure 2. Maximum Power Dissipation vs Case Temperature

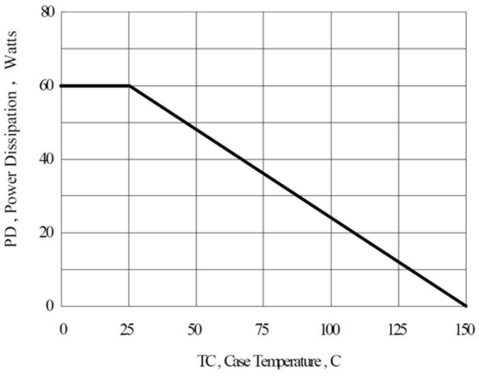


Figure3. Maximum Continuous Drain Current vs Case Temperature

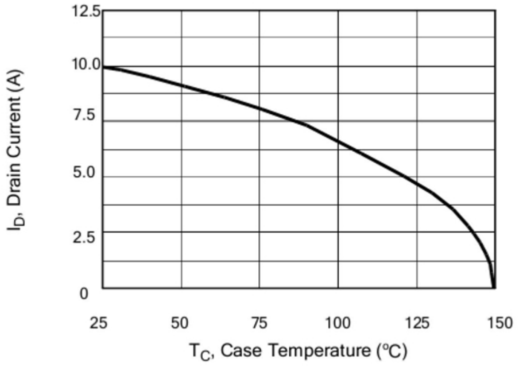


Figure 4. Typical Output Characteristics

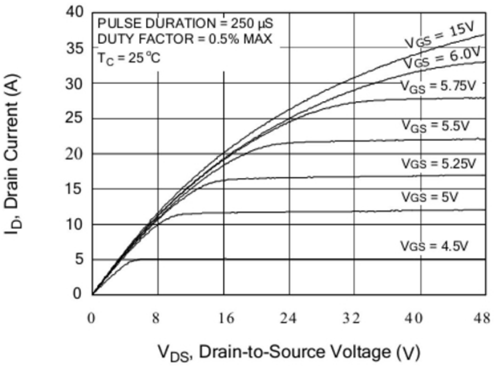


Figure5. Typical Drain-to-Source ON Resistance vs Gate Voltage and Drain Current

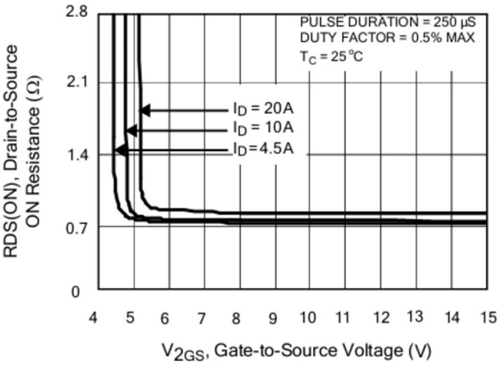


Figure 6. Maximum Peak Current Capability

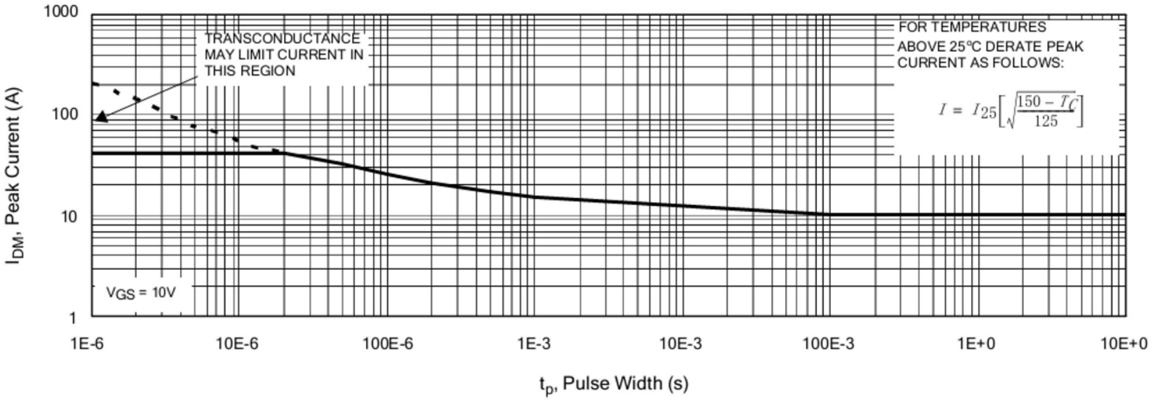


Figure 7. Typical Transfer Characteristics

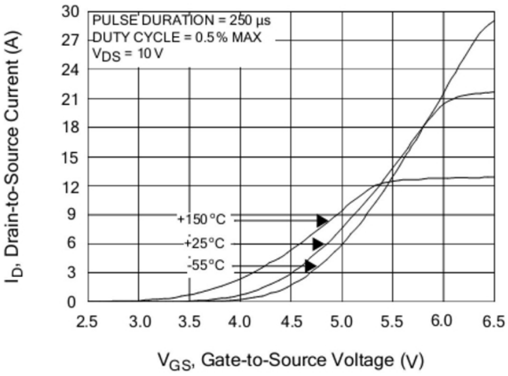


Figure8. Unclamped Inductive Switching Capability

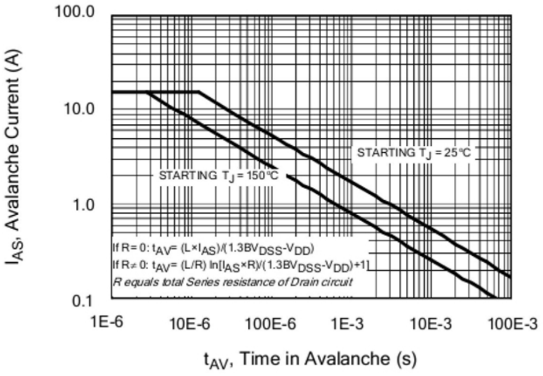


Figure 9. Typical Drain-to-Source ON Resistance vs Drain Current

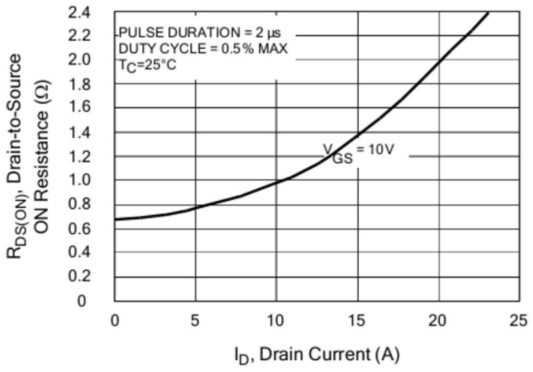


Figure 10. Typical Drain-to-Source ON Resistance vs Junction Temperature

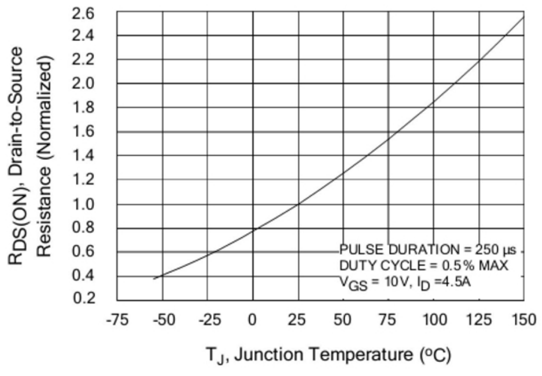


Figure 11. Typical Breakdown Voltage vs Junction Temperature

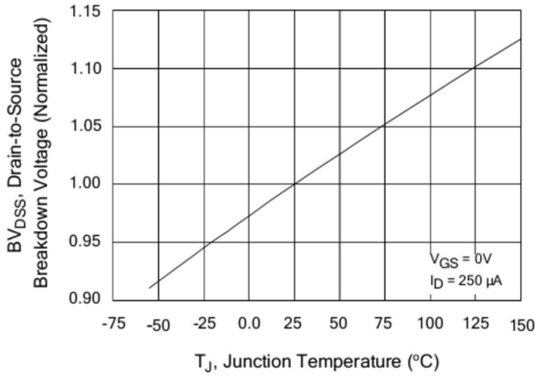


Figure 12. Typical Threshold Voltage vs Junction Temperature

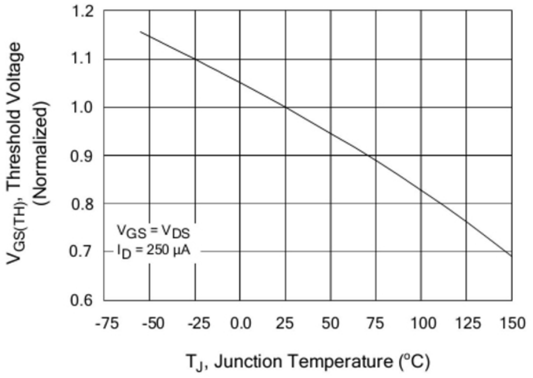


Figure 13. Maximum Forward Bias Safe Operating Area

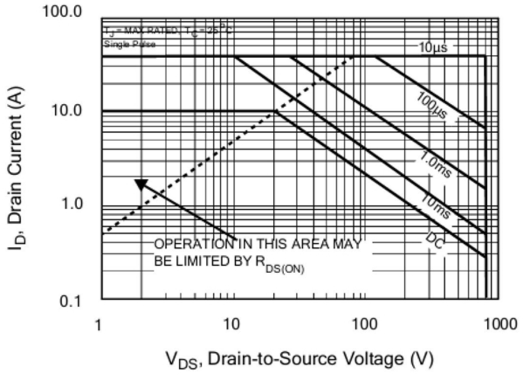


Figure 14. Typical Capacitance vs Drain-to-Source Voltage

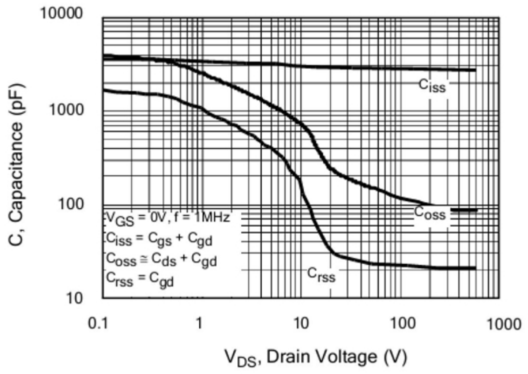


Figure 15. Typical Gate Charge vs Gate-to-Source Voltage

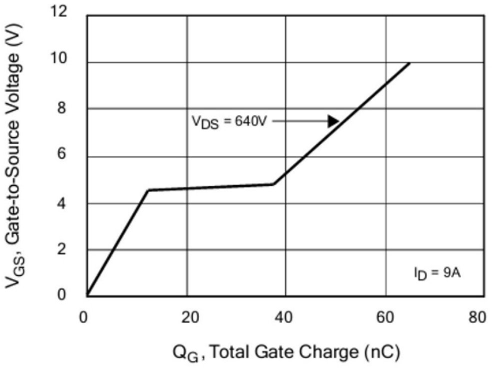
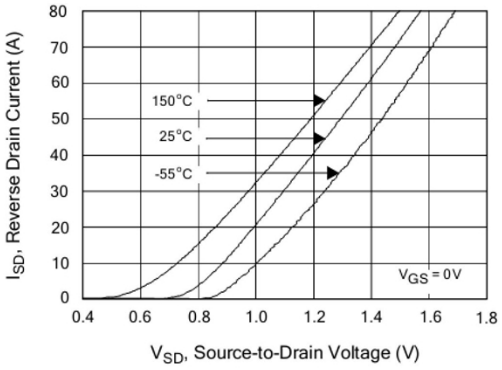
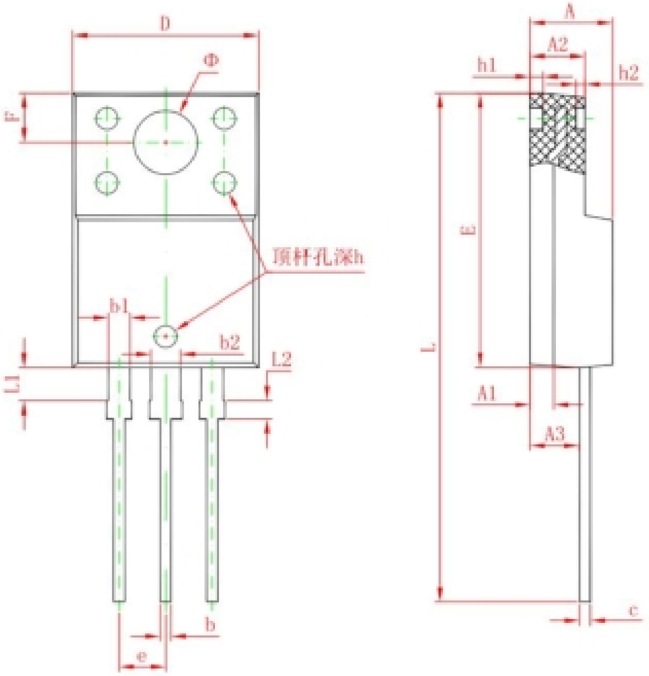


Figure 16. Typical Body Diode Transfer Characteristics



TO-220F Package Information



Symbol	Dimensions In Millimeters	
	Min.	Max.
A	4.300	4.700
A1	1.300 REF.	
A2	2.800	3.200
A3	2.500	2.900
b	0.500	0.750
b1	1.100	1.350
b2	1.500	1.750
c	0.500	0.750
D	9.960	10.360
E	14.800	15.200
e	2.540 TYP.	
F	2.700 REF.	
Φ	3.500 REF.	
h	0.000	0.300
h1	0.800 REF.	
h2	0.500 REF.	
L	28.000	28.400
L1	1.700	1.900
L2	0.900	1.100