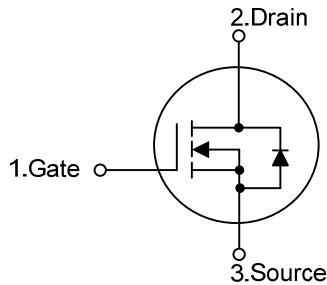


FEATURE

- 10A,650V, $R_{DS(ON)}=0.85\ \Omega @V_{GS}=10V/5A$
- Low gate charge
- Low C_{iss}
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability

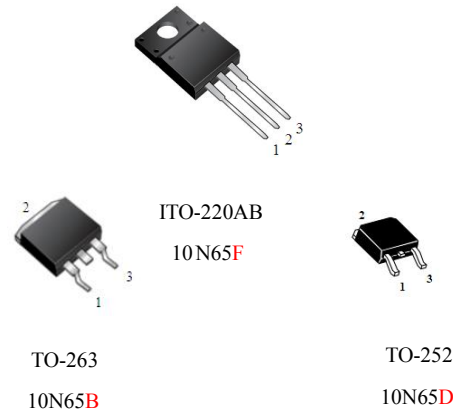


VOLTAGE RANGE

650 Volts

CURRENT

10Ampere



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Rating 25°C ambient temperature unless otherwise specified.
Single phase half wave, 60Hz, resistive or inductive load.

Parameter	Symbol	10N65	UNIT
Drain-Source Voltage	V_{DSS}	650	V
Gate-Source Voltage	V_{GSS}	± 30	
Continuous Drain Current	I_D	10	A
Pulsed Drain Current(Note1)	I_{DM}	40	
Single Pulse Avalanche Energy (Note 2)	E_{AS}	300	mJ
Avalanche Current(Note1)	I_{AR}	10	A
Repetitive Avalanche Energy (Note1)	E_{AR}	30	mJ
Reverse Diode dv/dt (Note 3)	dv/dt	5.5	V/ns
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C
Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	T_L	260	°C
Mounting Torque	6-32 or M3 screw	10	lbf • in
		1.1	N • m

RATING AND CHARACTERISTIC CURVES (10N65F)

Thermal Characteristics

Parameter	Symbol	ITO-220	TO-263	TO-252	Units
Maximum Junction-to-Case	R_{thJC}	1.0	0.8	2.6	°C/W
Maximum Power Dissipation	P_D	125	155	50	W

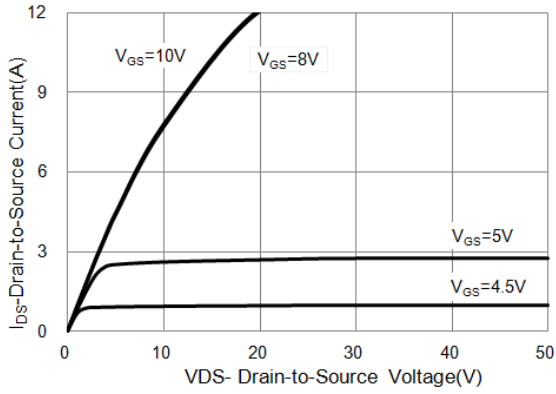
Electrical Characteristics ($T_c=25^\circ\text{C}$, unless otherwise noted)

Parameter	Symbol	Test Conditions	Mix	Typ	Max	Units
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	650	685	—	V
Breakdown Temperature Coefficient	$\Delta BV_{DSS} / \Delta T_J$	Reference to 25°C , $I_D=250\mu A$	—	0.6	—	V/°C
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=650V, V_{GS}=0V$	—	0.03	1	μA
Gate-Body Leakage Current, Forward	I_{GSSF}	$V_{GS}=30V, V_{DS}=0V$	—	—	100	nA
Gate-Body Leakage Current, Reverse	I_{GSSR}	$V_{GS}=-30V, V_{DS}=0V$	—	—	-100	nA
On Characteristics						
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS}=0V, I_D=250\mu A$	2	—	4	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=5A$	—	0.81	0.88	Ω
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V,$	—	—	1500	pF
Output Capacitance	C_{oss}	$f=1.0\text{MHZ}$	—	—	180	pF
Reverse Transfer Capacitance	C_{rss}		—	—	15	pF
Switching Characteristics						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=300V, I_D=10A,$	—	20	—	ns
Turn-On Rise Time	t_r	$R_g=25\Omega$ (Note4,5)	—	20	—	ns
Turn-Off Delay Time	$t_{d(off)}$		—	55	—	ns
Turn-Off Fall Time	t_f		—	30	—	ns
Total Gate Charge	Q_g	$V_{DS}=520V, I_D=10A,$	—	60	—	nC
Gate-Source Charge	Q_{gs}	$V_{GS}=10V,$ (Note4,5)	—	12	—	nC
Gate-Drain Charge	Q_{gd}		—	28	—	nC
Drain-Source Body Diode Characteristics and Maximum Ratings						
Continuous Diode Forward Current	I_S		—	—	10	A
Pulsed Diode Forward Current	I_{SM}		—	—	40	A
Diode Forward Voltage	V_{SD}	$I_S=10A, V_{GS}=0V$	—	—	1.5	V
Reverse Recovery Time	t_{rr}	$V_{GS}=0V, I_S=10A,$	—	600	—	ns
Reverse Recovery Charge	Q_{rr}	$dI_F/dt=100A/\mu s,$ (Note4)	—	4.3	—	μC

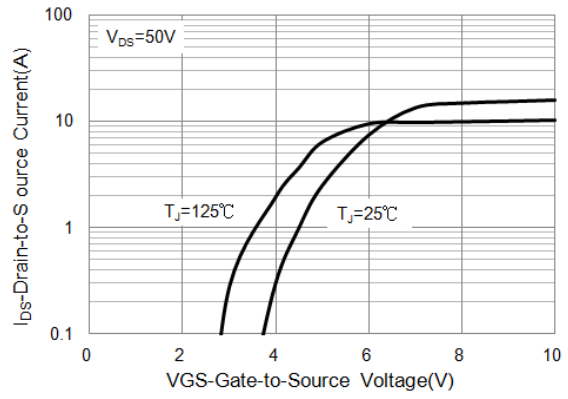
Notes

1. Repetitive Rating: pulse width limited by maximum junction temperature.
2. $V_{DD}=50V$, starting, $L=5.5\text{mH}$, $R_g=25\Omega$, $I_{AS}=10A$, $T_J=25^\circ\text{C}$.
3. $I_{SD} \leq I_D$, $dI/dt=200A/\mu s$, $V_{DD} \leq BV_{DSS}$, starting $T_J=25^\circ\text{C}$.
4. Pulse width $\leq 300\mu s$; duty cycle $\leq 2\%$.
5. Repetitive rating; pulse width limited by maximum junction temperature.

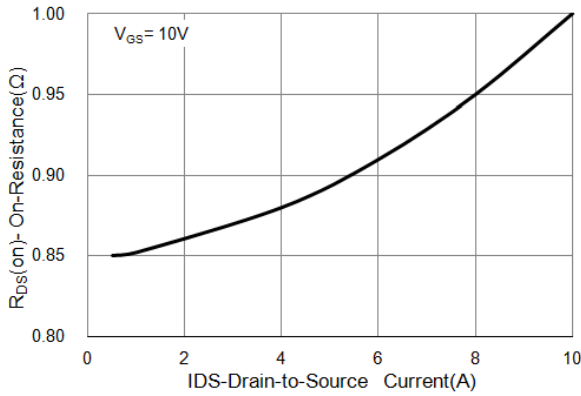
RATING AND CHARACTERISTIC CURVES (10N65F)



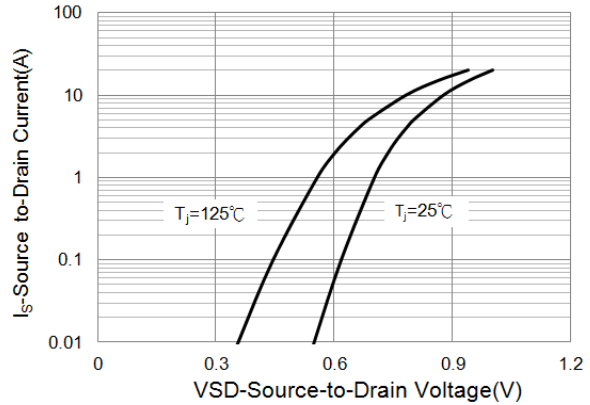
Output Characteristics



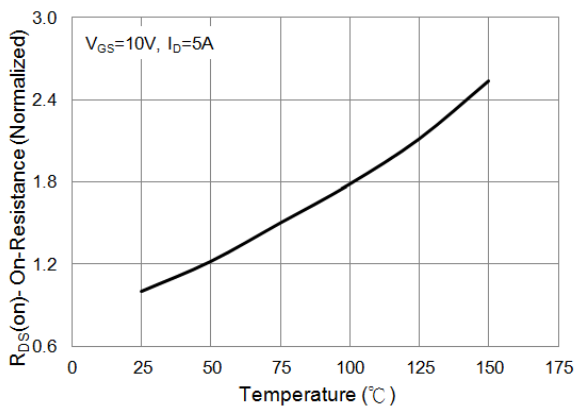
Transfer Characteristics



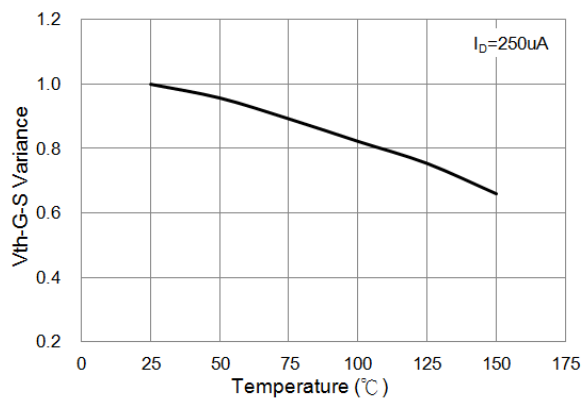
On-Resistance vs. Drain Current



Source-Drain Diode Forward Voltage



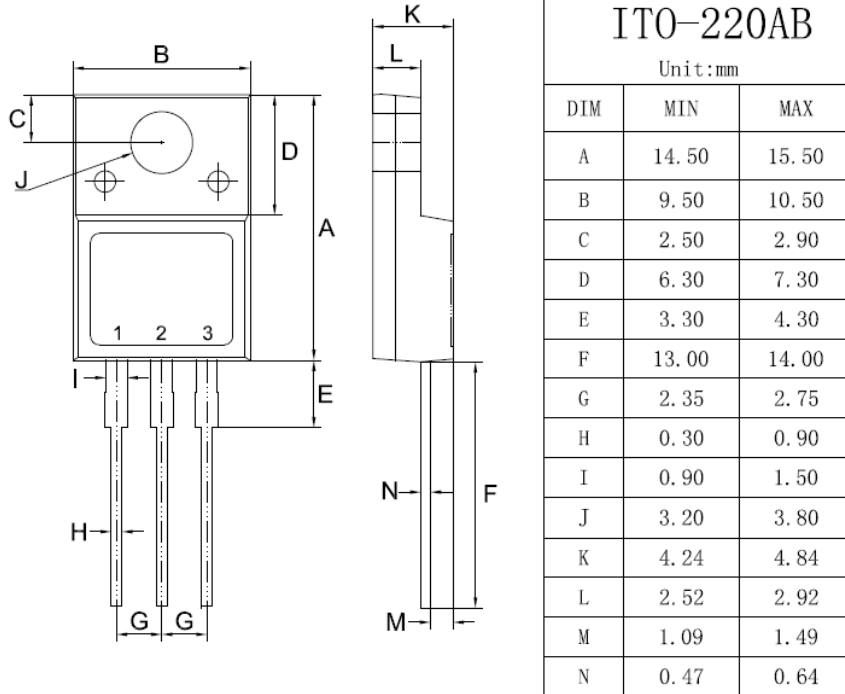
On-Resistance vs. Junction Temperature



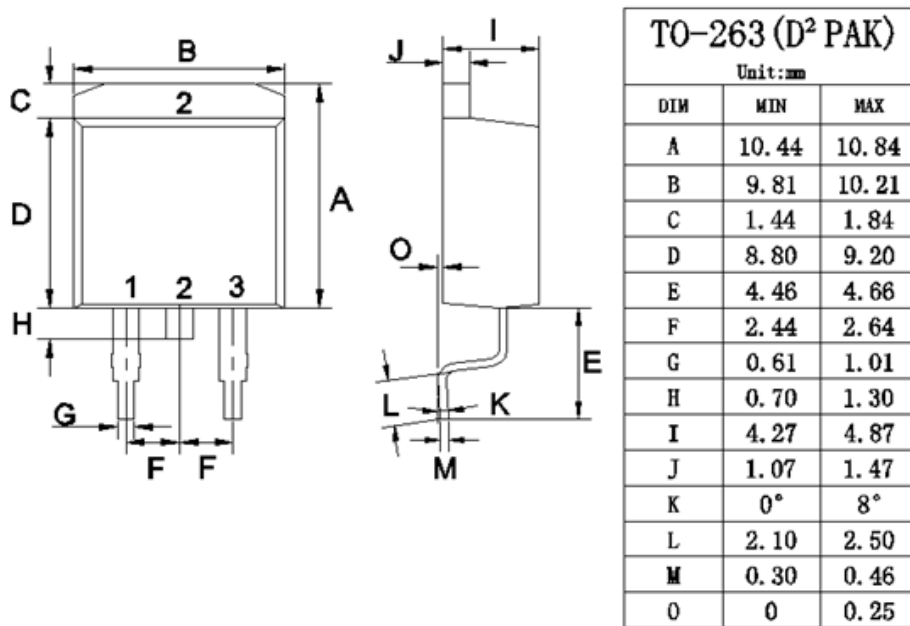
Threshold Voltage Variation with Temperature

RATING AND CHARACTERISTIC CURVES (10N65F)

ITO-220 Mechanical Drawing

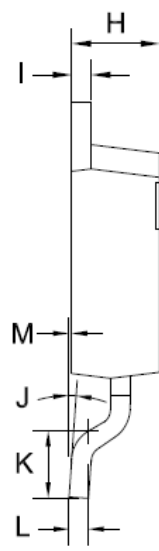
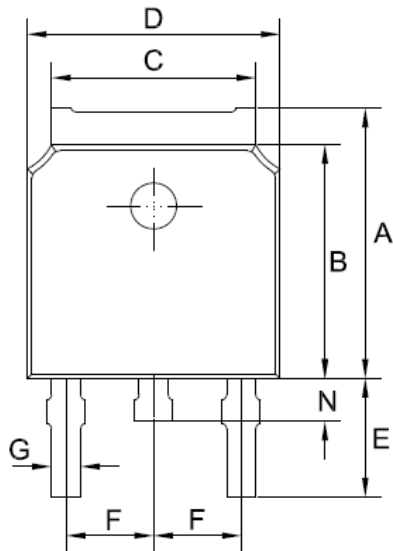


TO-263 Mechanical Drawing



RATING AND CHARACTERISTIC CURVES (10N65F)

TO-252 Mechanical Drawing



TO-252 (DPAK)		
Unit:mm		
DIM	MIN	MAX
A	6.85	7.25
B	5.90	6.30
C	5.13	5.53
D	6.40	6.80
E	2.90	3.30
F	2.19	2.39
G	0.45	0.85
H	2.20	2.40
I	0.41	0.61
J	0°	8°
K	1.45	1.85
L	0.41	0.61
M	0.00	0.12
N	0.60	1.00