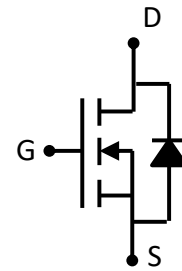


Feature

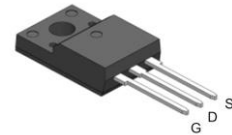
- 650V,10A
 $R_{DS(ON)} < 0.95 \Omega @ V_{GS}=10V$ TYP:0.8 Ω
- Fast Switching
- Lead free product is acquired
- Excellent $R_{DS(ON)}$ and Low Gate Charge



Schematic diagram

Application

- PWM applications
- Load Switch
- Power management



TO-220F

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
10N65F	AP10N65F	TO-220F	-	-	1000

ABSOLUTE MAXIMUM RATINGS ($T_a=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	650	V
Gate-Source Voltage	V_{GS}	± 30	V
Continuous Drain Current ($T_c = 25^\circ\text{C}$)	I_D	10	A
Continuous Drain Current ($T_c = 100^\circ\text{C}$)	I_D	6	A
Pulsed Drain Current ⁽¹⁾	I_{DM}	40	A
Single Pulsed Avalanche Energy ⁽²⁾	E_{AS}	600	mJ
Power Dissipation	P_D	50	W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	2.5	$^\circ\text{C}/\text{W}$
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55~ +150	$^\circ\text{C}$

MOSFET ELECTRICAL CHARACTERISTICS($T_a=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	650	-	-	V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 650V, V_{GS} = 0V$	-	-	1	μA
Gate-body leakage current	I_{GSS}	$V_{GS} = \pm 30V, V_{DS} = 0V$	-	-	± 100	nA
Gate threshold voltage ⁽³⁾	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2	2.9	4	V
Drain-source on-resistance ⁽³⁾	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 5.0A$	-	0.8	0.95	Ω
Forward tranconductance ⁽³⁾	g_{FS}	$V_{DS} = 15V, I_D = 2.0A$	-	7.0	-	S
Dynamic characteristics						
Input Capacitance	C_{iss}	$V_{DS} = 25V, V_{GS} = 0V, f = 1MHz$	-	1700	-	pF
Output Capacitance	C_{oss}		-	178	-	
Reverse Transfer Capacitance	C_{rss}		-	8	-	
Switching characteristics						
Turn-off delay time	$t_{d(off)}$	$V_{DD} = 325V, I_D = 10A, V_{GS} = 10V, R_G = 25\Omega$	-	50	-	ns
Total Gate Charge	Q_g	$V_{DS} = 520V, I_D = 10A, V_{GS} = 10V$	-	37	-	nC
Gate-Source Charge	Q_{gs}		-	7.6	-	
Gate-Drain Charge	Q_{gd}		-	12	-	
Source-Drain Diode characteristics						
Diode Forward voltage ⁽³⁾	V_{DS}	$V_{GS} = 0V, I_S = 10A$	-	-	1.4	V
Diode Forward current ⁽⁴⁾	I_S		-	-	10	A
Body Diode Reverse Recovery Time	t_{rr}	$T_J = 25^{\circ}, I_F = 10A, di/dt = 100A/us$		420		ns
Body Diode Reverse Recovery Charge	Q_{rr}	$T_J = 25^{\circ}, I_F = 10A, di/dt = 100A/us$		4.2		uc

Notes:

1. Repetitive Rating: pulse width limited by maximum junction temperature
2. EAS Condition: $T_J = 25^{\circ}\text{C}, V_{DD} = 50V, R_G = 25\Omega, L = 10mH$
3. Pulse Test: pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
4. Surface Mounted on FR4 Board, $t \leq 10$ sec

Typical Characteristics

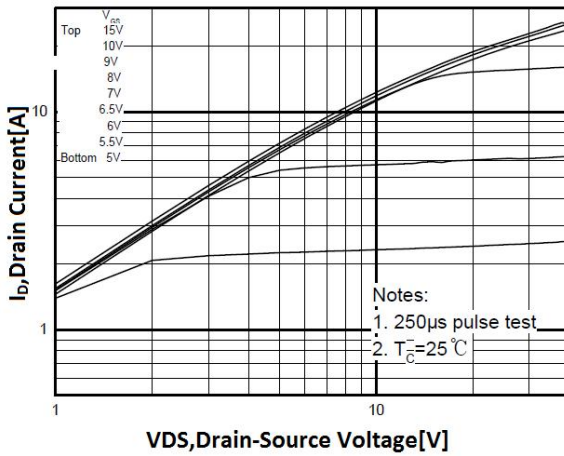


Fig1 Typical Output Characteristics, Tc=25°C

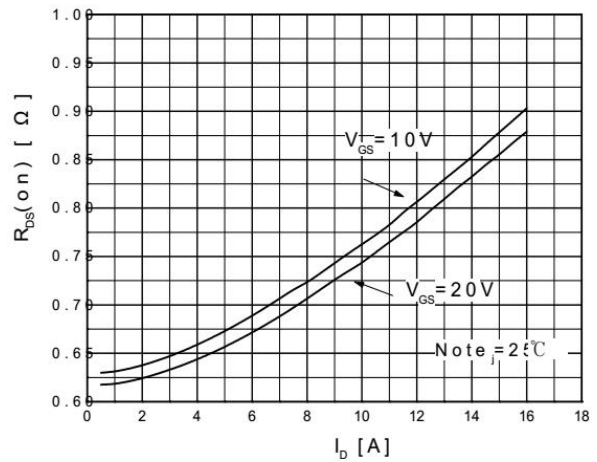


Fig2 On-Resistance Vs. Drain Current and Gate Voltage

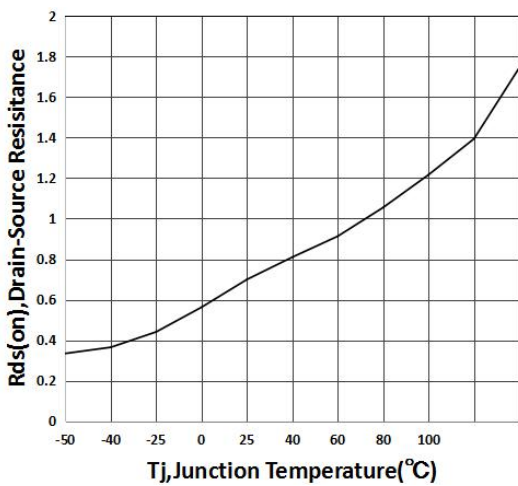


Fig3 Normalized On-Resistance Vs. Temperature

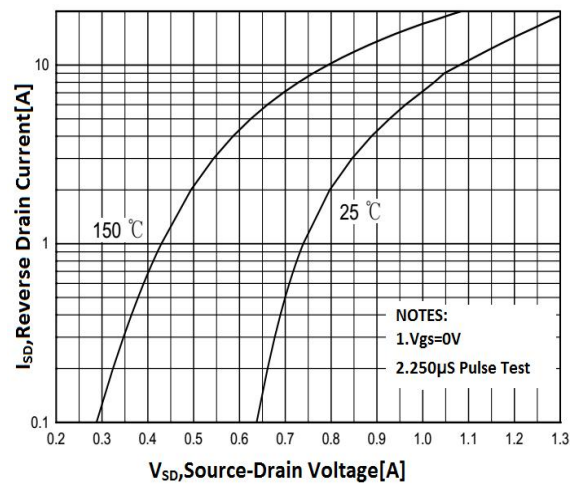


Fig4 Typical Source-Drain Diode Forward Voltage

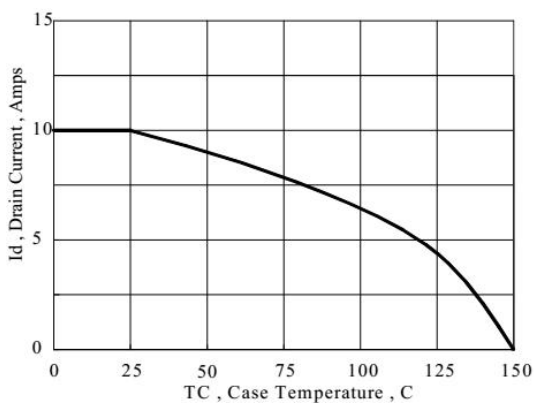


Fig5 Maximum Drain Current Vs. Case Temperature

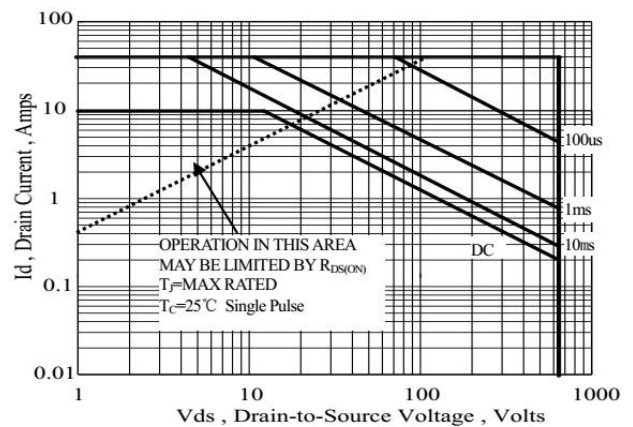


Fig6 Maximum Safe Operating Area

TO-220F Package Information

