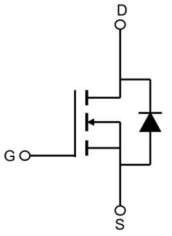
Feature

- 650V,2A
  $R_{DS(ON)}$ <5.0Ω @V_{GS}=10V TYP:4.0Ω
- Fast Switching
- Lead free product is acquired
- Excellent $R_{DS(ON)}$ and Low Gate Charge



Schematic Diagram

Marking and pin assignment

Application

- PWM applications
- Load Switch
- Power management

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
2N65U	AP2N65U	TO-251	-	-	-

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 Current (T_a =25℃)	I_D	2	A
Continuous Drain Current (T_a =100℃)	I_D	1.25	A
Pulsed Drain Current (1)	I_{DM}	8	A
Single Pulsed Avalanche Energy (2)	E_{AS}	120	mJ
Power Dissipation	P_D	40	W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	2.84	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55~ +150	℃

MOSFET ELECTRICAL CHARACTERISTICS(T_a=25℃ 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 =250μA	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} =±30V, V_{DS} = 0V	-	-	±100	nA
Gate threshold voltage(3)	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	2	3.3	4	V
Drain-source on-resistance(3)	$R_{DS(on)}$	V_{GS} =10V, I_D =2A	-	4.0	5.0	Ω
Forward tranconductance(3)	g_{FS}	V_{DS} =40V, I_D =1.0A	-	1.5	-	S
Dynamic characteristics						
Input Capacitance	C_{iss}	V_{DS} =25V, V_{GS} =0V, f =1MHz	-	290	-	pF
Output Capacitance	C_{oss}		-	31	-	
Reverse Transfer Capacitance	C_{rss}		-	9	-	
Switching characteristics						
Turn-off delay time	$t_{d(off)}$	V_{DD}=325V, I_D=2A,V_{GS}=10V, R_G=25Ω	-	24	-	ns
Total Gate Charge	Qg	VDS=520V, ID=2A, VGS=10V	-	6.7	-	nC
Gate-Source Charge	Qgs		-	1.9	-	
Gate-Drain Charge	Qgd		-	1.8	-	
Source-Drain Diode characteristics						
Diode Forward voltage(3)	V_{DS}	V_{GS} =0V, I_S=2A	-	-	1.4	V
Diode Forward current(4)	I_S		-	-	2	A
Body Diode Reverse Recovery Time	trr	T_J=25°， IF=2A,di/dt=100A/us		368		ns
Body Diode Reverse Recovery Charge	Qrr	T_J=25°， IF=2A,di/dt=100A/us		1.0		uc

Notes:

1. Repetitive Rating: pulse width limited by maximum junction temperature
2. EAS Condition:T_J=25℃,V_{DD}=50V,R_G=2.0Ω,L=56mH
3. Pulse Test: pulse width≤300μs, duty cycle≤2%
4. Surface Mounted on FR4 Board,t≤10 sec

Typical Performance Characteristics

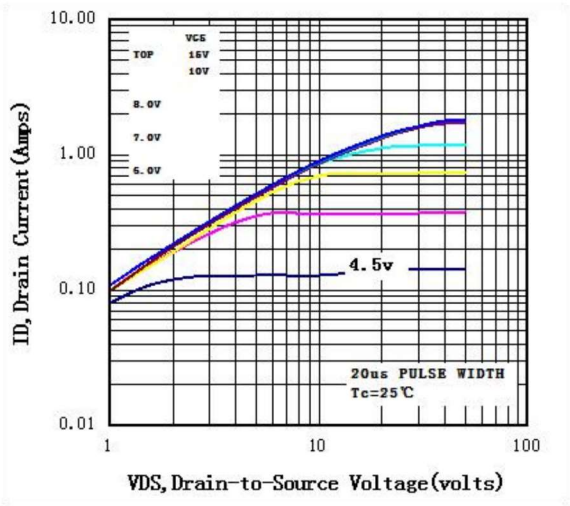


Fig1 Typical Output Characteristics, Tc=25℃

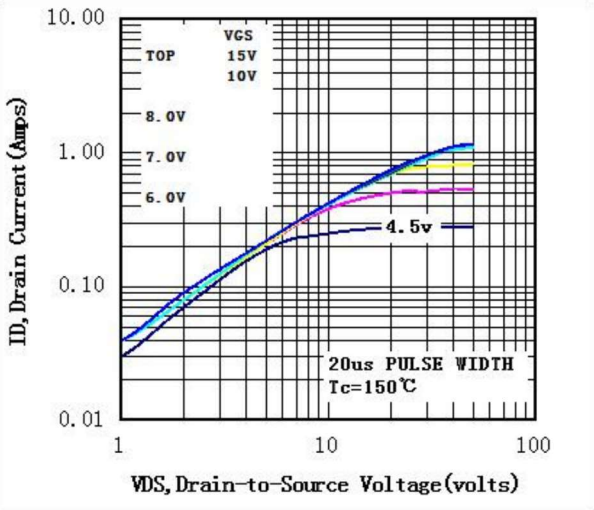


Fig2 Typical Output Characteristics, Tc=150℃

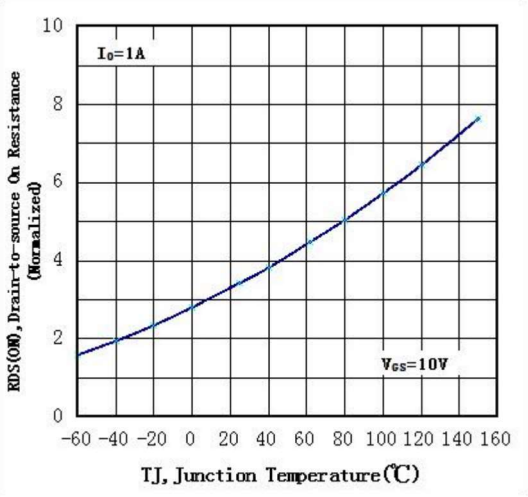


Fig3 Normalized On-Resistance Vs.Temperature

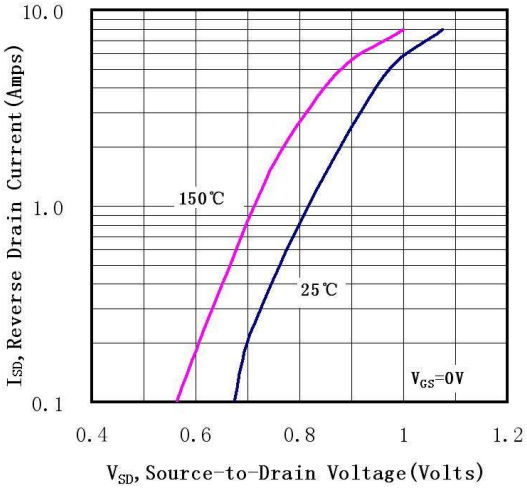


Fig4 Typical Source-Drain Diode Forward Voltage

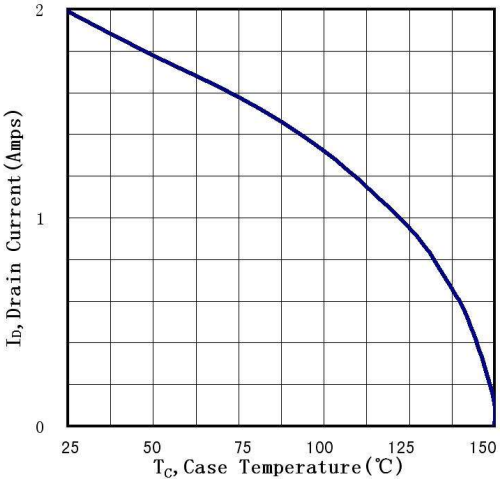


Fig5 Maximum Drain Current Vs.Case Temperature

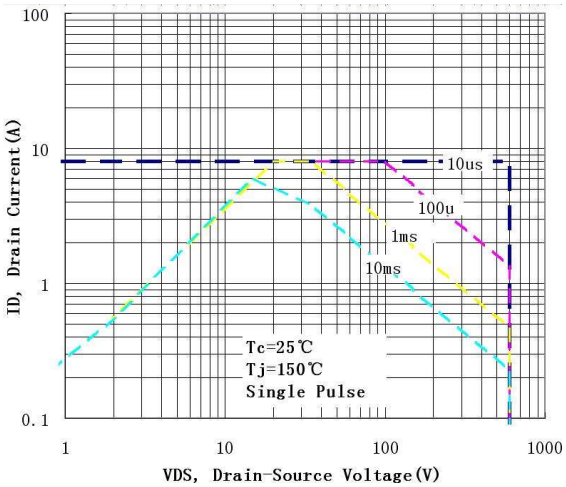
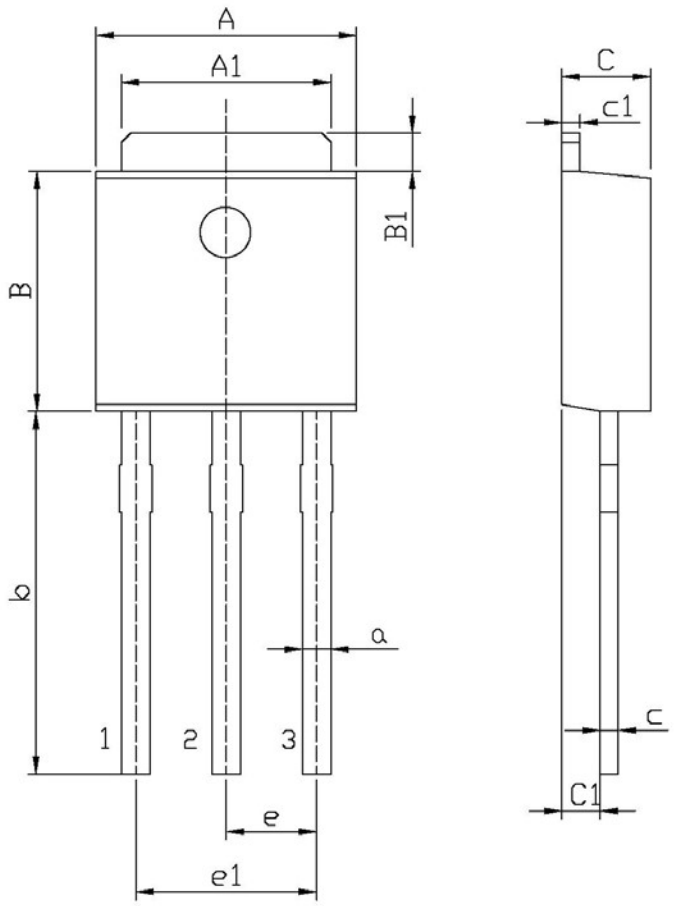


Fig6 Maximum Safe Operating Area

TO-251 Package Information



单位：mm

Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
A	6.45	6.75	a	0.50	0.70
A1	5.10	5.50	b	9.00	9.40
B	5.95	6.25	c	0.45	0.55
B1	0.95	1.25	c1	0.45	0.55
C	2.20	2.40	e	2.24	2.34
C1	0.95	1.15	e1	4.43	4.73

TO-251