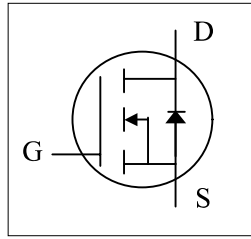
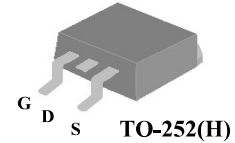


## N-Channel Power MOSFET

- ▼ 100% R<sub>g</sub> & UIS Test
- ▼ Simple Drive Requirement
- ▼ Fast Switching Characteristic
- ▼ RoHS Compliant & Halogen-Free



$BV_{DSS}$	100V
$R_{DS(ON)}$	115m $\Omega$
$I_D$	10A



### Description

AP10N10K series are from Advanced Power innovated design and silicon process technology to achieve the lowest possible on-resistance and fast switching performance. It provides the designer with an extreme efficient device for use in a wide range of power applications.

The TO-252 package is widely preferred for all commercial-industrial surface mount applications using infrared reflow technique and suited for high current application due to the low connection resistance.

### Absolute Maximum Ratings@T<sub>j</sub>=25°C(unless otherwise specified)

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	100	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D@T_C=25^\circ C$	Drain Current, $V_{GS}$ @ 10V	10	A
$I_D@T_C=100^\circ C$	Drain Current, $V_{GS}$ @ 10V	6.2	A
$I_{DM}$	Pulsed Drain Current <sup>1</sup>	28	A
$P_D@T_C=25^\circ C$	Total Power Dissipation	20.8	W
$P_D@T_A=25^\circ C$	Total Power Dissipation <sup>3</sup>	2	W
$E_{AS}$	Single Pulse Avalanche Energy <sup>4</sup>	8	mJ
$T_{STG}$	Storage Temperature Range	-55 to 150	°C
$T_J$	Operating Junction Temperature Range	-55 to 150	°C

### Thermal Data

Symbol	Parameter	Value	Units
Rthj-c	Maximum Thermal Resistance, Junction-case	6	°C/W
Rthj-a	Maximum Thermal Resistance, Junction-ambient (PCB mount) <sup>3</sup>	62.5	°C/W

**AP10N10K**
**N-Channel Power MOSFET**
**Electrical Characteristics@T<sub>J</sub>=25°C(unless otherwise specified)**

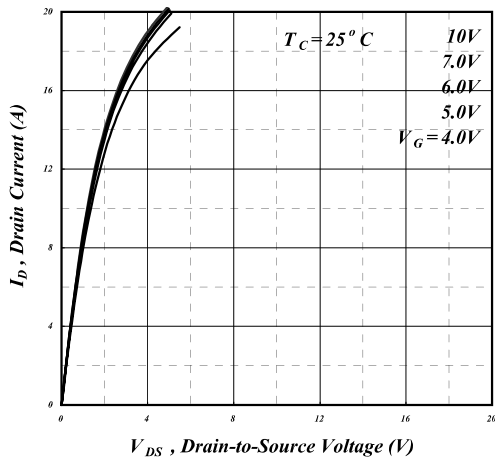
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	100	-	-	V
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> =10V, I <sub>D</sub> =5A	-	-	115	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =3A	-	-	135	mΩ
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	1	-	2	V
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =10V, I <sub>D</sub> =5A	-	17	-	S
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =80V, V <sub>GS</sub> =0V	-	-	25	uA
I <sub>GSS</sub>	Gate-Source Leakage	V <sub>GS</sub> = ±20V, V <sub>DS</sub> =0V	-	-	±100	nA
Q <sub>g</sub>	Total Gate Charge	I <sub>D</sub> =5A	-	11	17.6	nC
Q <sub>gs</sub>	Gate-Source Charge	V <sub>DS</sub> =80V	-	2	-	nC
Q <sub>gd</sub>	Gate-Drain ("Miller") Charge	V <sub>GS</sub> =10V	-	2	-	nC
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DS</sub> =50V	-	6	-	ns
t <sub>r</sub>	Rise Time	I <sub>D</sub> =5A	-	8	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time	R <sub>G</sub> =3.3Ω	-	14	-	ns
t <sub>f</sub>	Fall Time	V <sub>GS</sub> =10V	-	3	-	ns
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V	-	580	928	pF
C <sub>oss</sub>	Output Capacitance	V <sub>DS</sub> =50V	-	27	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance	f=1.0MHz	-	19	-	pF
R <sub>g</sub>	Gate Resistance	f=1.0MHz	-	2	4	Ω

**Source-Drain Diode**

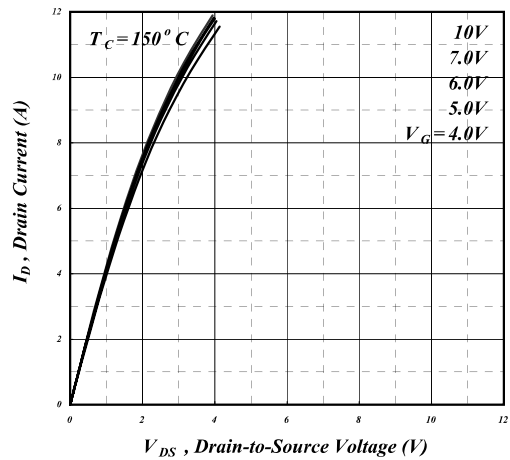
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V <sub>SD</sub>	Forward On Voltage <sup>2</sup>	I <sub>S</sub> =5A, V <sub>GS</sub> =0V	-	-	1.3	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>S</sub> =5A, V <sub>GS</sub> =0V,	-	20	-	ns
Q <sub>rr</sub>	Reverse Recovery Charge	di/dt=100A/μs	-	18	-	nC

**Notes:**

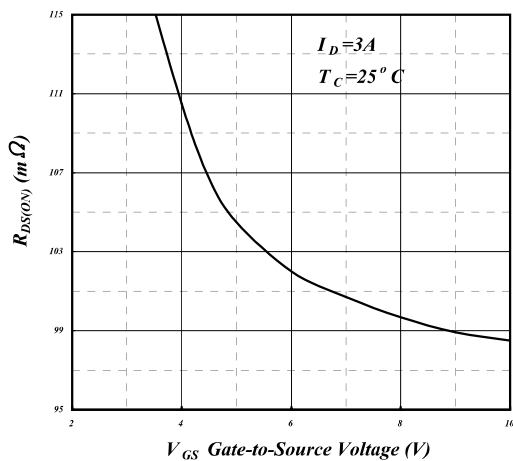
- 1.Pulse width limited by Max. junction temperature.
- 2.Pulse test
- 3.Surface mounted on 1 in<sup>2</sup> copper pad of FR4 board
- 4.Starting T<sub>J</sub>=25°C , V<sub>DD</sub>=50V , L=1mH , R<sub>G</sub>=25Ω



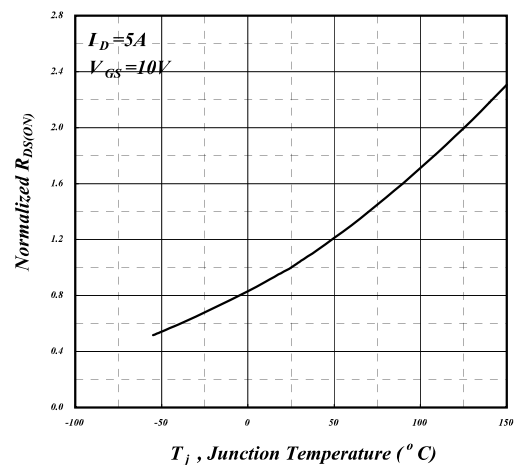
**Fig 1. Typical Output Characteristics**



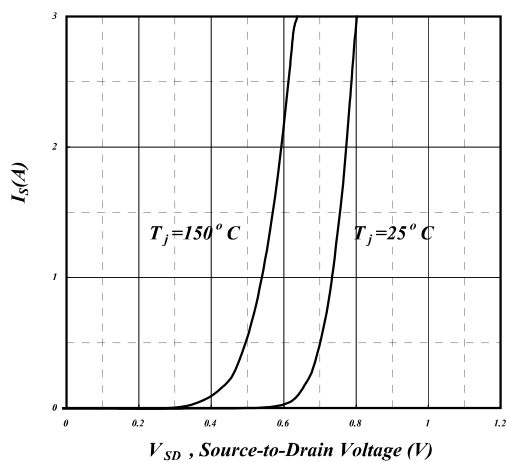
**Fig 2. Typical Output Characteristics**



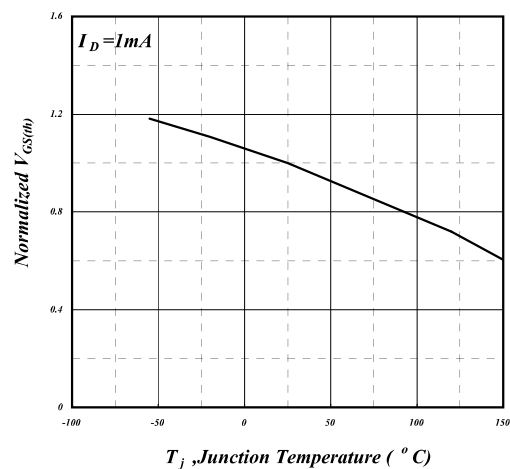
**Fig 3. On-Resistance v.s. Gate Voltage**



**Fig 4. Normalized On-Resistance v.s. Junction Temperature**

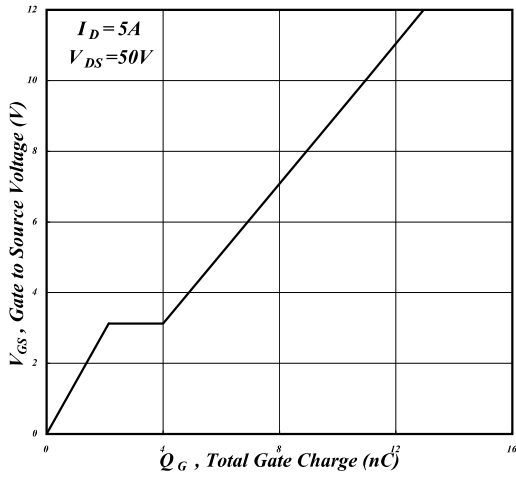


**Fig 5. Forward Characteristic of Reverse Diode**

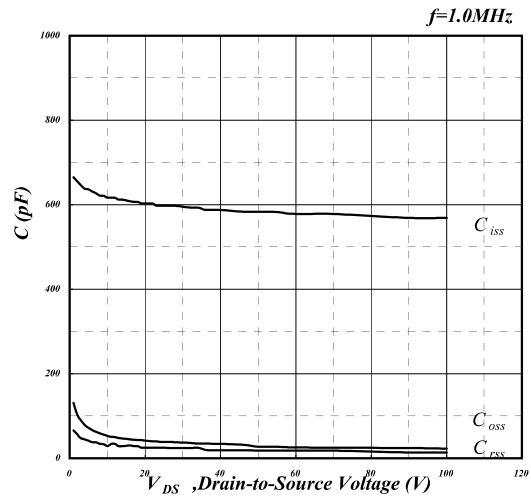


**Fig 6. Gate Threshold Voltage v.s. Junction Temperature**

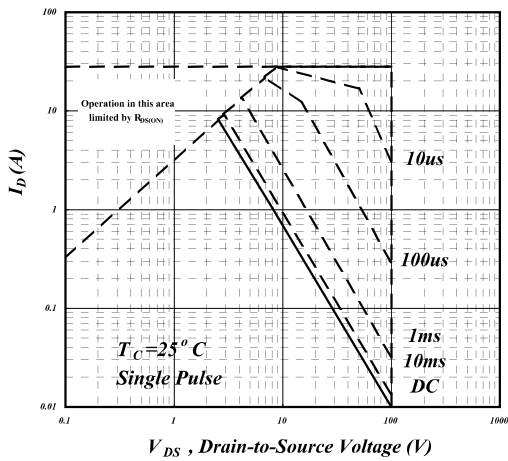
**AP10N10K**  
**N-Channel Power MOSFET**



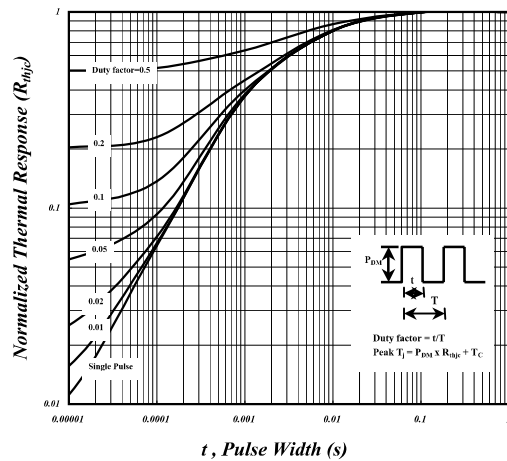
**Fig 7. Gate Charge Characteristics**



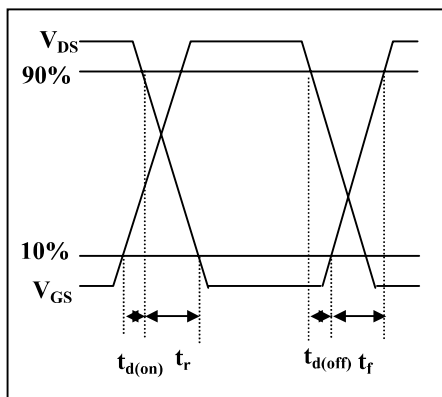
**Fig 8. Typical Capacitance Characteristics**



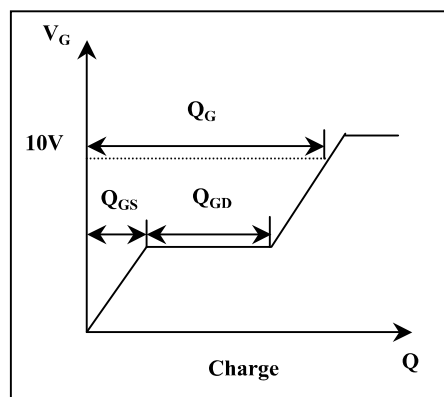
**Fig 9. Maximum Safe Operating Area**



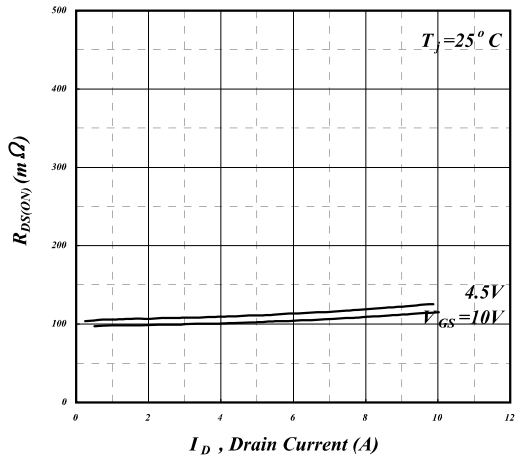
**Fig 10. Effective Transient Thermal Impedance**



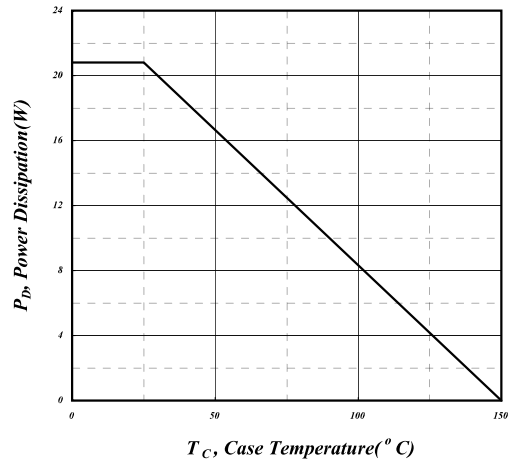
**Fig 11. Switching Time Waveform**



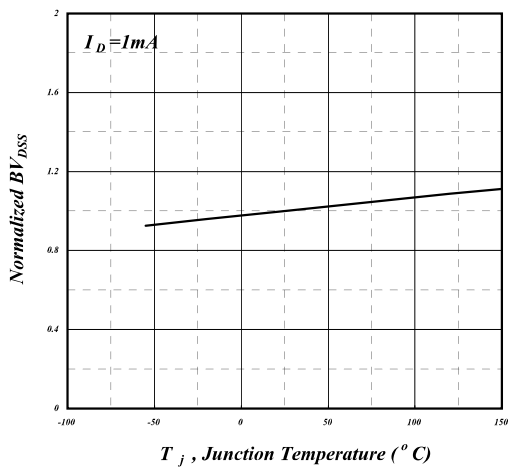
**Fig 12. Gate Charge Waveform**



**Fig 13. Typ. Drain-Source on State Resistance**



**Fig 14. Total Power Dissipation**



**Fig 15. Normalized  $BV_{DSS}$  v.s. Junction**

**MARKING INFORMATION**

