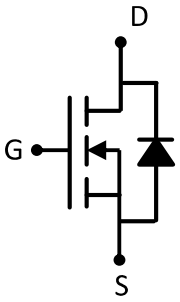
Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
100V	13mΩ@10V	59A
	20mΩ@4.5V	

TO220

Schematic diagram



Feature

- Trench DMOS Power MOSFET
- Fast Switching
- Exceptional on-resistance and maximum DC current capability

Application

- DC/DC Converter
- Load Switch for Portable Devices
- Battery Switch

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AP59N10	AP59N10	TO-220-3L		-	-

ABSOLUTE MAXIMUM RATINGS (T_a=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	+20/-12	V
Continuous Drain Current	I_D	59	A
Pulsed Drain Current	I_{DM}	210	A
Single pulse avalanche energy	EAS	125	mJ
Power Dissipation	P_D	120	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	62.5	℃/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	100			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =100V, V_{GS} = 0V			1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =+20V/-12V, V_{DS} = 0V			±100	nA
Gate threshold voltage(1)	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	1	1.5	2.5	V
Drain-source on-resistance(1)	$R_{DS(on)}$	V_{GS} =10V, I_D =35A		11	13	mΩ
		V_{GS} =4.5V, I_D =25A		17	20	
Forward tranconductance(1)	g_{FS}	V_{DS} =10V, I_D =10A		10		S
Dynamic characteristics(2)						
Input Capacitance	C_{iss}	V_{DS} =50V, V_{GS} =0V, f =1MHz		1640		pF
Output Capacitance	C_{oss}			240		
Reverse Transfer Capacitance	C_{rss}			4		
Switching characteristics(2)						
Turn-on delay time	$t_{d(on)}$	V_{DD}=50V, I_D=1A, R_L=6Ω V_{GS}=10V, R_G=1Ω		14.2		ns
Turn-on rise time	t_r			20.8		
Turn-off delay time	$t_{d(off)}$			42		
Turn-off fall time	t_f			30		
Total Gate Charge	Qg	VDS=50V, ID=10A, VGS=10V		27.8		nC
Gate-Source Charge	Qgs			3.5		
Gate-Drain Charge	Qgd			8.8		
Source-Drain Diode characteristics						
Diode Forward voltage(1)	V_{DS}	V_{GS} =0V, I_S=1A			1	V

Notes:

1. Pulse test; pulse width≤300μs, duty cycle≤2%.
2. Guaranteed by design, not subject to production testing.

Typical Electrical and Thermal Characteristics

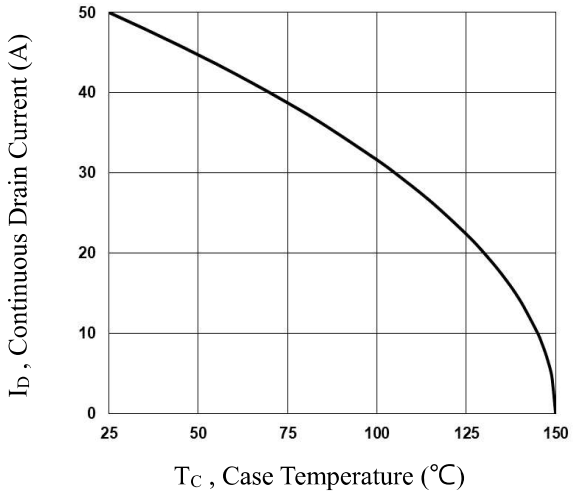


Fig.1 Continuous Drain Current vs. T_C

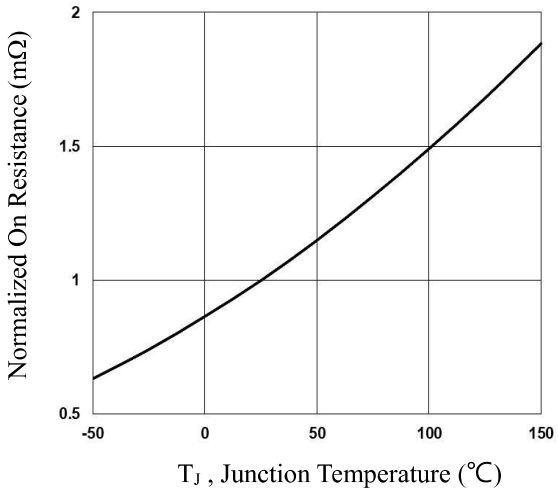


Fig.2 Normalized RDSON vs. T_J

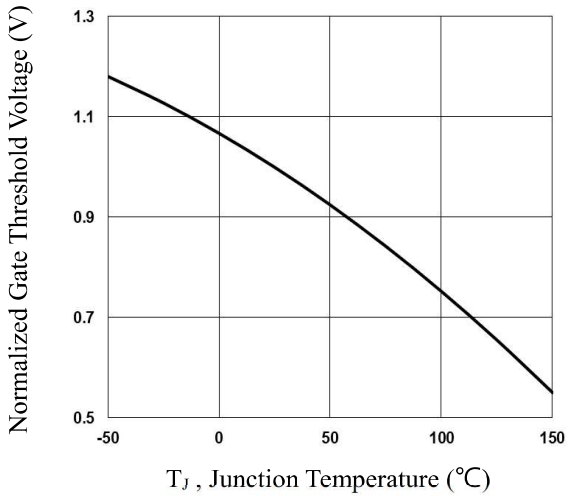


Fig.3 Normalized Vth vs. T_J

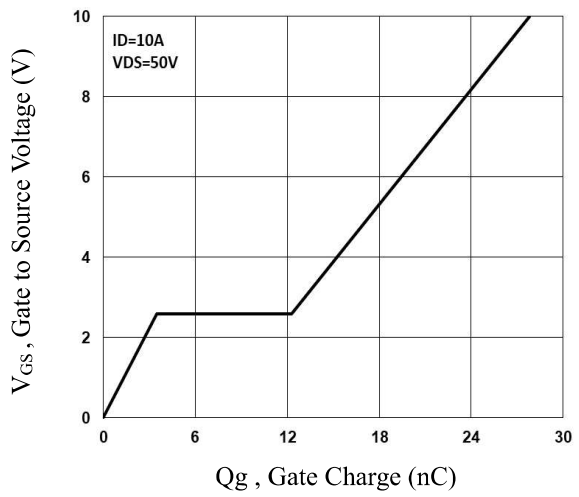


Fig.4 Gate Charge Characteristics

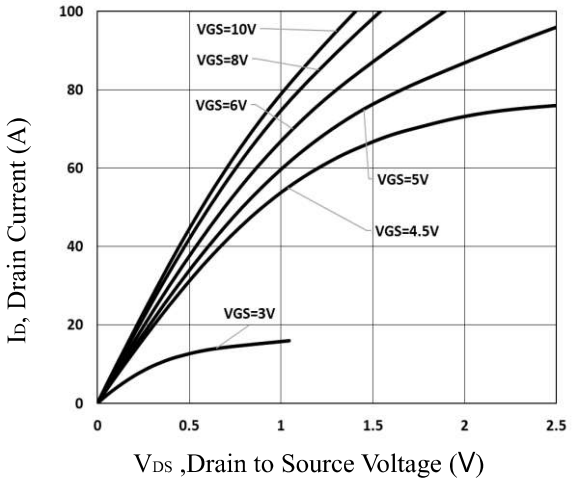


Fig.5 Typical Output Characteristics

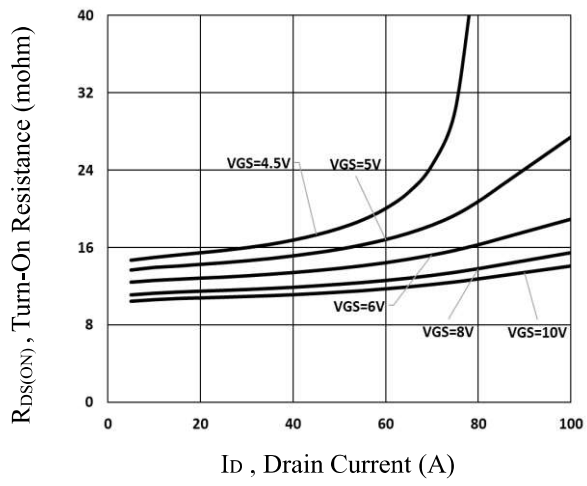


Fig.6 Turn-On Resistance vs. I_D

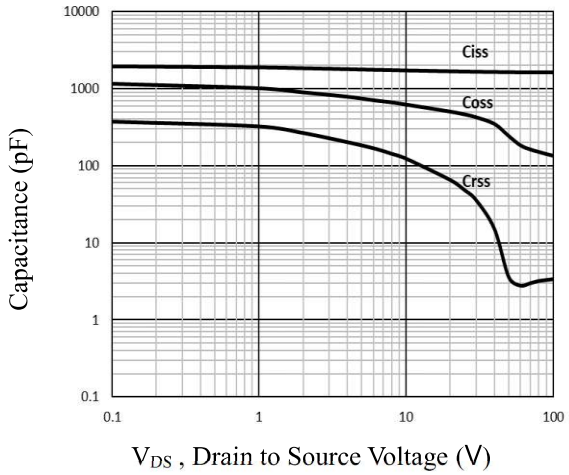


Fig.7 Capacitance Characteristics

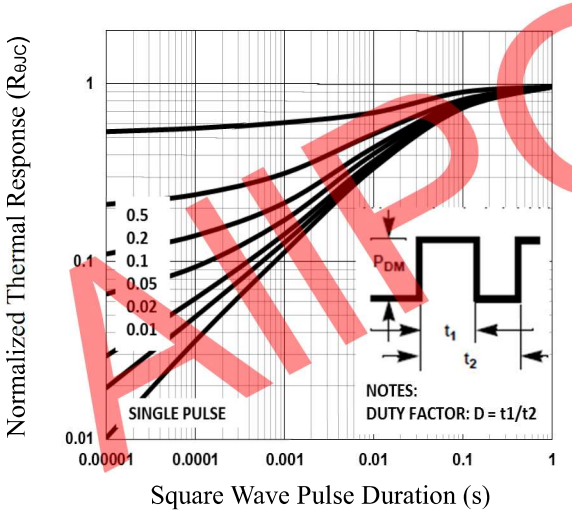


Fig.8 Normalized Transient Impedance

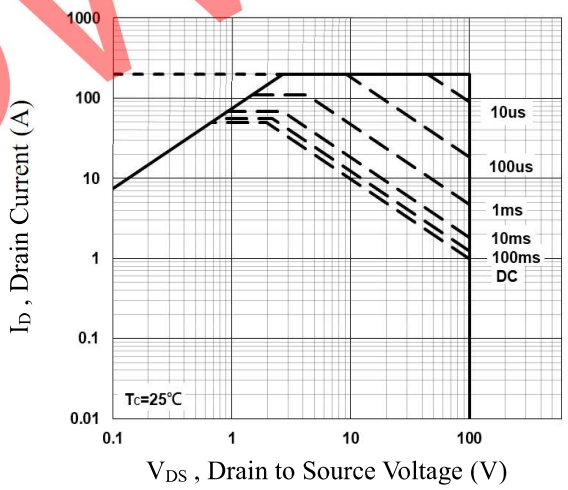


Fig.9 Maximum Safe Operation Area

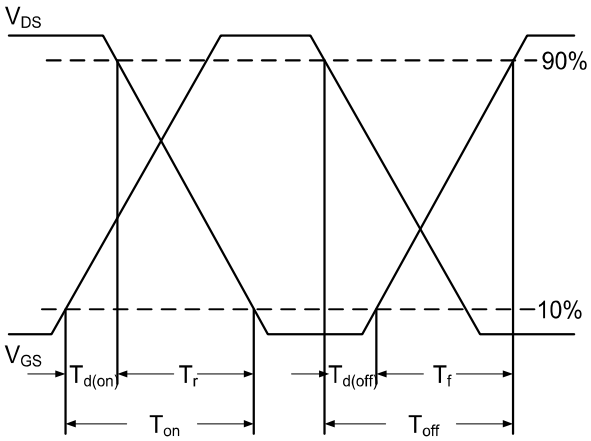


Fig.10 Switching Time Waveform

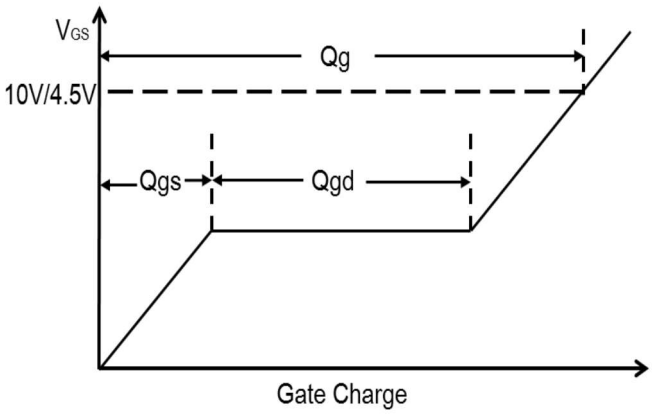
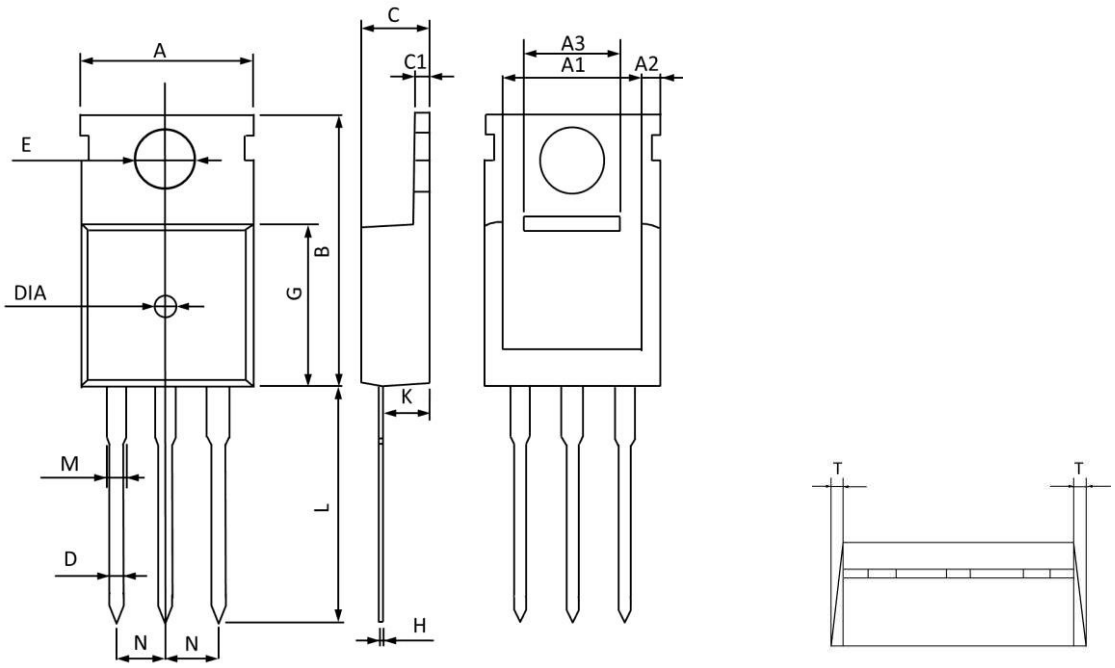


Fig.11 Gate Charge Waveform

TO220 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	10.300	9.700	0.406	0.382
A1	8.840	8.440	0.348	0.332
A2	1.250	1.050	0.049	0.041
A3	5.300	5.100	0.209	0.201
B	16.200	15.400	0.638	0.606
C	4.680	4.280	0.184	0.169
C1	1.500	1.100	0.059	0.043
D	1.000	0.600	0.039	0.024
E	3.800	3.400	0.150	0.134
G	9.300	8.700	0.366	0.343
H	0.600	0.400	0.024	0.016
K	2.700	2.100	0.106	0.083
L	13.600	12.800	0.535	0.504
M	1.500	1.100	0.059	0.043
N	2.590	2.490	0.102	0.098
T	W0.35		W0.014	
DIA	Φ1.5 TYP.	deep0.2 TYP.	Φ0.059 TYP.	deep0.008 TYP.