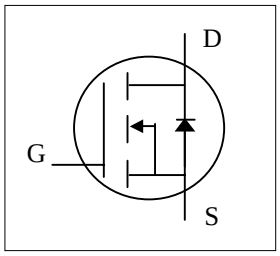
AP14SL50W-HF

Halogen-Free Product

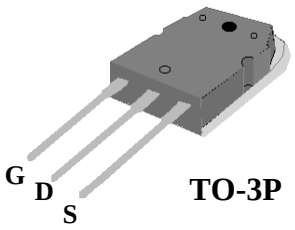
Advanced Power Electronics Corp.

N-CHANNEL ENHANCEMENT MODE POWER MOSFET

- ▼ **100% R_g & UIS Test**
- ▼ **Fast Switching Characteristic**
- ▼ **Simple Drive Requirement**
- ▼ **RoHS Compliant & Halogen-Free**



V_{DS} @ $T_{j,max.}$	550V
$R_{DS(ON)}$	0.28Ω
I_D	13A



TO-3P

Description

AP14SL50 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-3P package is widely preferred for commercial-industrial applications. The device is suited for switch mode power supplies, DC-AC converters and high current high speed switching circuits.

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	500	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Drain Current, V_{GS} @ 10V[3]	13	A
I_D@T_C=100℃	Drain Current, V_{GS} @ 10V[3]	8.2	A
I_{DM}	Pulsed Drain Current[1]	32	A
dv/dt	MOSFET dv/dt Ruggedness (V_{DS} = 0 …400V)	50	V/ns
P_D@T_C=25℃	Total Power Dissipation	89.2	W
P_D@T_A=25℃	Total Power Dissipation	3.12	W
E_{AS}	Single Pulse Avalanche Energy[4]	108	mJ
dv/dt	Peak Diode Recovery dv/dt[5]	15	V/ns
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Value	Units
Rthj-c	Maximum Thermal Resistance, Junction-case	1.4	℃/W
Rthj-a	Maximum Thermal Resistance, Junction-ambient	40	℃/W

Electrical Characteristics@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	500	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V, I_D=4A	-	-	0.28	Ω
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	2	-	5	V
g_{fs}	Forward Transconductance	V_{DS}=10V, I_D=5A	-	10	-	S
I_{DSS}	Drain-Source Leakage Current	V_{DS}=400V, V_{GS}=0V	-	-	100	uA
I_{GSS}	Gate-Source Leakage	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Q_g	Total Gate Charge	I_D=5A	-	25	40	nC
Q_{gs}	Gate-Source Charge	V_{DS}=400V	-	4	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	V_{GS}=10V	-	10	-	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=250V	-	8	-	ns
t_r	Rise Time	I_D=5A	-	20	-	ns
$t_{d(off)}$	Turn-off Delay Time	R_G=3.3Ω	-	33	-	ns
t_f	Fall Time	V_{GS}=10V	-	33	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V	-	910	1456	pF
C_{oss}	Output Capacitance	V_{DS}=100V	-	45	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	1.5	-	pF
R_g	Gate Resistance	f=1.0MHz	-	3.6	7.2	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage[2]	I_S=4A, V_{GS}=0V	-	0.8	-	V
t_{rr}	Reverse Recovery Time	I_S=5A, V_{GS}=0V	-	210	-	ns
Q_{rr}	Reverse Recovery Charge	dI/dt=50A/μs	-	1.15	-	μC

Notes:

1.Pulse width limited by max. junction temperature.

2.Pulse test

3.Limited by max. junction temperature. Maximum duty cycle D=0.75

4.Starting T_j=25°C , V_{DD}=50V , L=150mH , R_G=25Ω

5.$I_{SD} \leqq I_D$, $V_{DD} \leqq BV_{DSS}$, starting T_J = 25°C

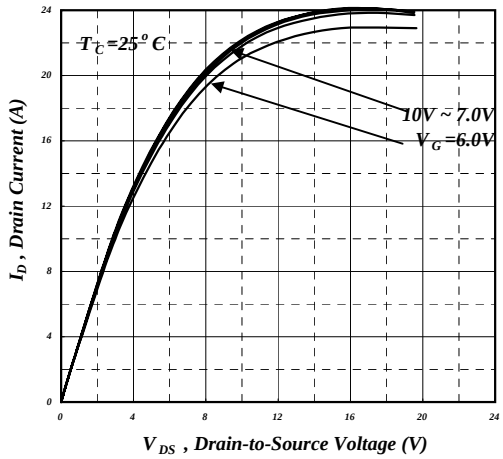


Fig 1. Typical Output Characteristics

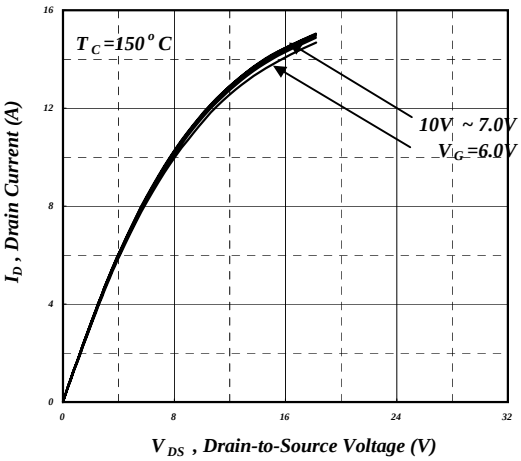


Fig 2. Typical Output Characteristics

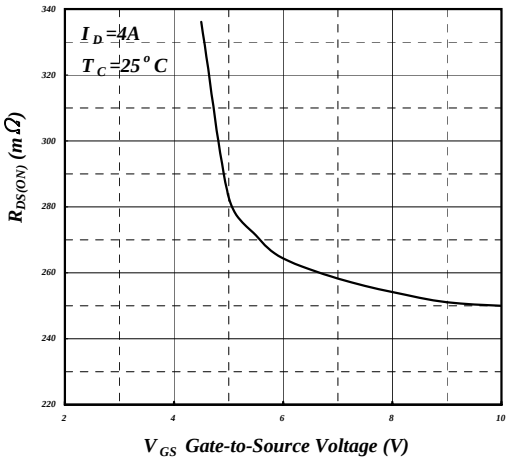


Fig 3. On-Resistance v.s. Gate Voltage

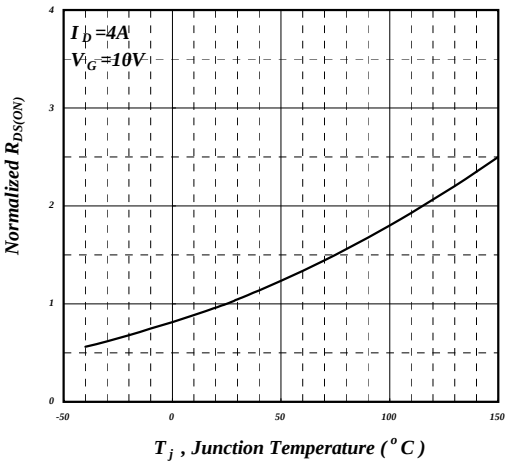


Fig 4. Normalized On-Resistance v.s. Junction Temperature

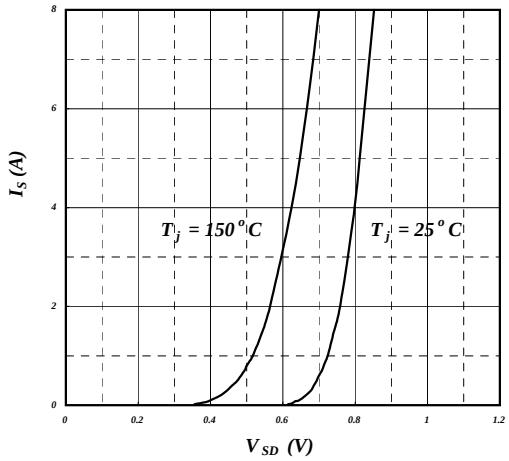


Fig 5. Forward Characteristic of Reverse Diode

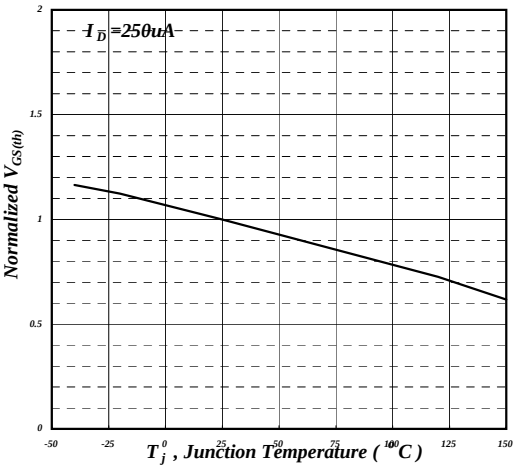


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

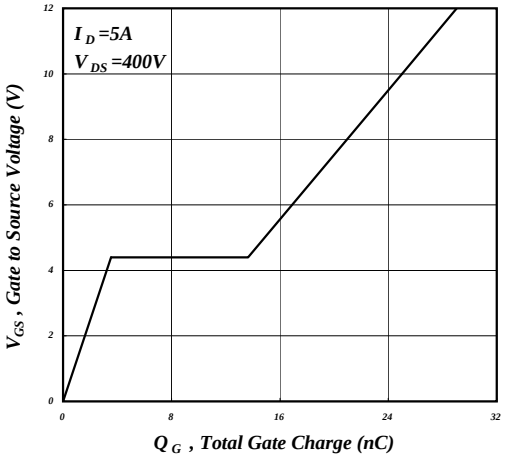


Fig 7. Gate Charge Characteristics

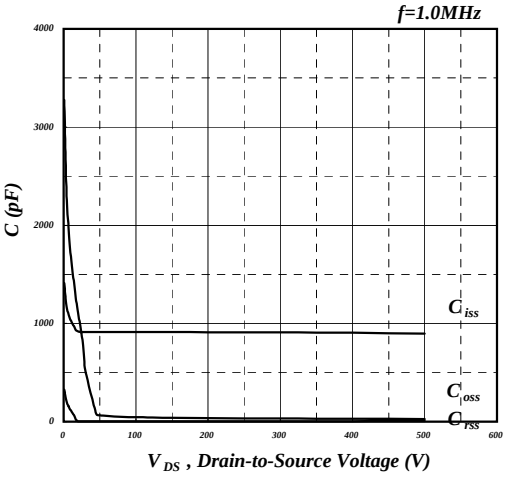


Fig 8. Typical Capacitance Characteristics

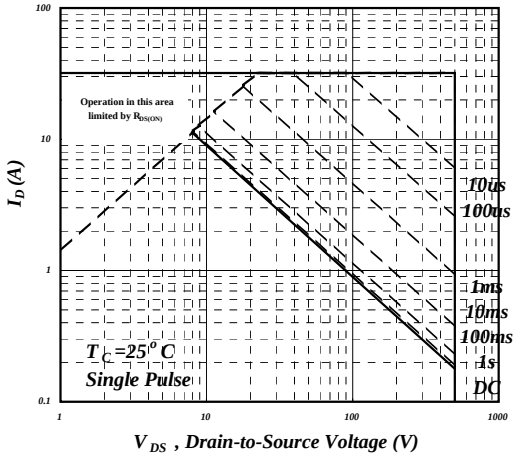


Fig 9. Maximum Safe Operating Area

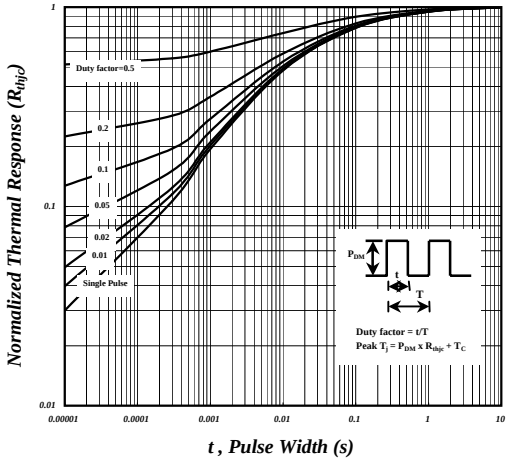


Fig10. Effective Transient Thermal Impedance

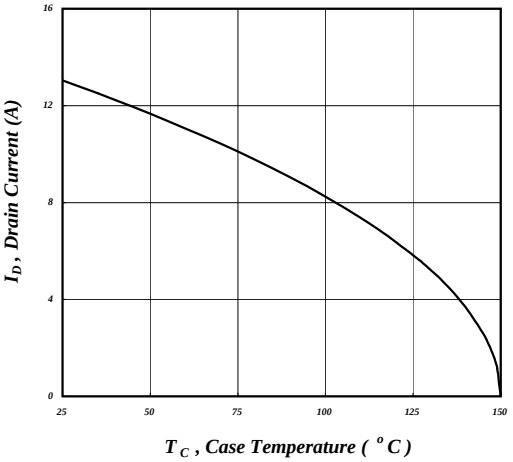


Fig 11. Drain Current v.s. Case Temperature

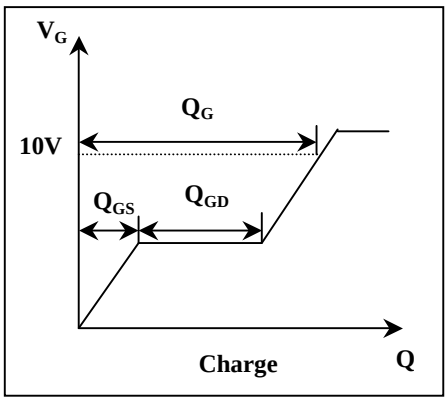


Fig 12. Gate Charge Waveform

MARKING INFORMATION