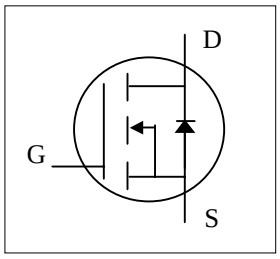
AP70SL1K4BK2

Halogen-Free Product

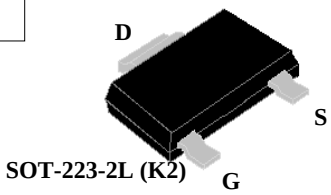
Advanced Power Electronics Corp.

N-CHANNEL ENHANCEMENT MODE POWER MOSFET

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



BV_{DSS}	700V
$R_{DS(ON)}$	1.4Ω
I_D[3]	3.2A



SOT-223-2L (K2)

Description

AP70SL1K4B 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 SOT-223-2L package is specially designed for high voltage suface mount application with big Drain-to-Source pin space.

Absolute Maximum Ratings@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	700	V
V_{GS}	Gate-Source Voltage	±20	V
V_{GS}	Gate-Source Voltage, AC (f > 1Hz)	±30	V
I_D@T_C=25℃	Drain Current, V_{GS} @ 10V[3]	3.2	A
I_{DM}	Pulsed Drain Current[1]	8.3	A
dv/dt	MOSFET dv/dt Ruggedness (V_{DS} = 0 …400V)	20	V/ns
P_D@T_A=25℃	Total Power Dissipation[6]	2.78	W
E_{AS}	Single Pulse Avalanche Energy[4]	18	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-a	Maximum Thermal Resistance, Junction-ambient[6]	45	℃/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	700	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V, I_D=1A	-	-	1.4	Ω
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	2	-	5	V
g_{fs}	Forward Transconductance	V_{DS}=20V, I_D=1A	-	2.4	-	S
I_{DSS}	Drain-Source Leakage Current	V_{DS}=560V, V_{GS}=0V	-	-	100	uA
I_{GSS}	Gate-Source Leakage	V_{GS}=±20V, V_{DS}=0V	-	-	±1	uA
Q_g	Total Gate Charge	I_D=1.5A	-	11.2	18	nC
Q_{gs}	Gate-Source Charge	V_{DS}=480V	-	3	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	V_{GS}=10V	-	5	-	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=400V	-	11	-	ns
t_r	Rise Time	I_D=1.5A	-	9	-	ns
$t_{d(off)}$	Turn-off Delay Time	R_G=10Ω	-	27	-	ns
t_f	Fall Time	V_{GS}=10V	-	15	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V	-	380	608	pF
C_{oss}	Output Capacitance	V_{DS}=100V	-	15	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	6	-	pF
R_g	Gate Resistance	f=1.0MHz	-	12	24	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
I_S	Source Current (Body Diode)	T_C=25°C	-	-	1	A
V_{SD}	Forward On Voltage[2]	I_S=1A, V_{GS}=0V	-	0.8	-	V
t_{rr}	Reverse Recovery Time	I_S=1.5A, V_{GS}=0V	-	130	-	ns
Q_{rr}	Reverse Recovery Charge	dI/dt=100A/μs	-	610	-	nC

Notes:

1.Pulse width limited by max. junction temperature.

2.Pulse test

3.TO-252 equivalent. Limited by max. junction temperature. Maximum duty cycle D=0.75

4.Starting T_j=25°C , V_{DD}=50V , L=100mH , R_G=25Ω

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

6.Surface mounted on 1 in^2 copper pad of FR4 board, t ≤10sec ; 160 ℃/W when mounted on Min. copper pad.

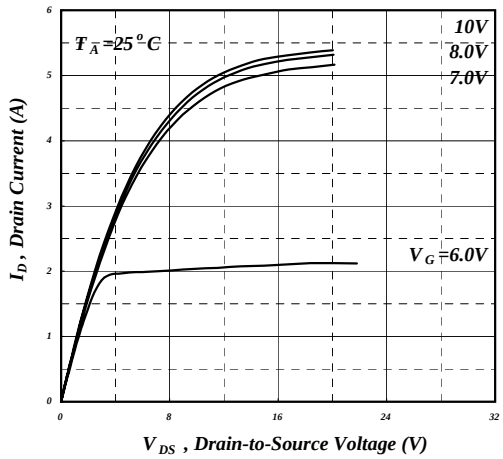


Fig 1. Typical Output Characteristics

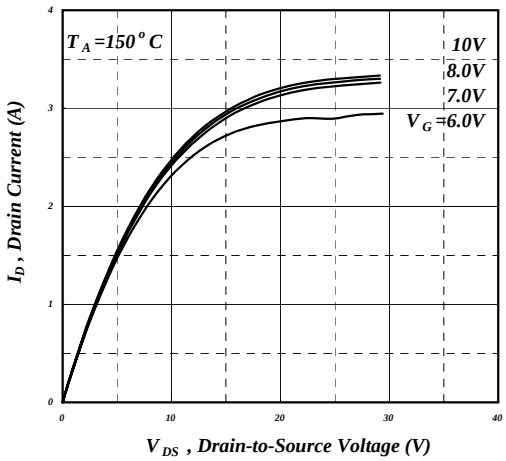


Fig 2. Typical Output Characteristics

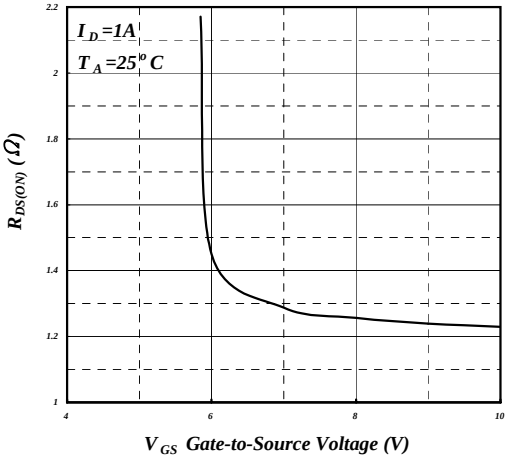


Fig 3. On-Resistance v.s. Gate Voltage

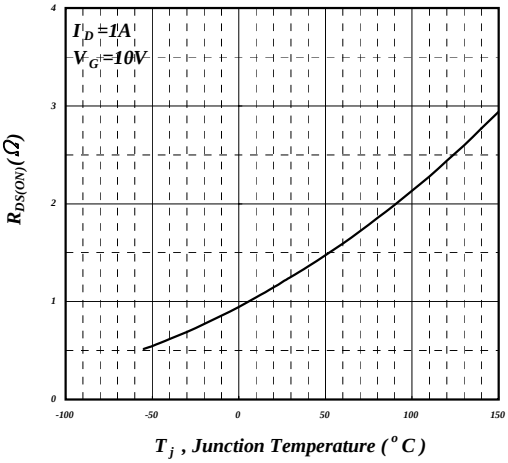


Fig 4. Static On-Resistance v.s. Junction Temperature

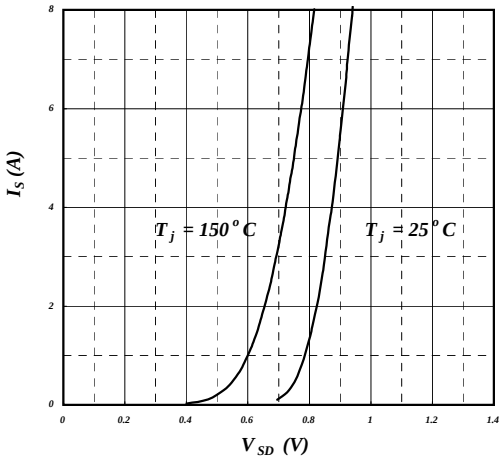


Fig 5. Forward Characteristic of Reverse Diode

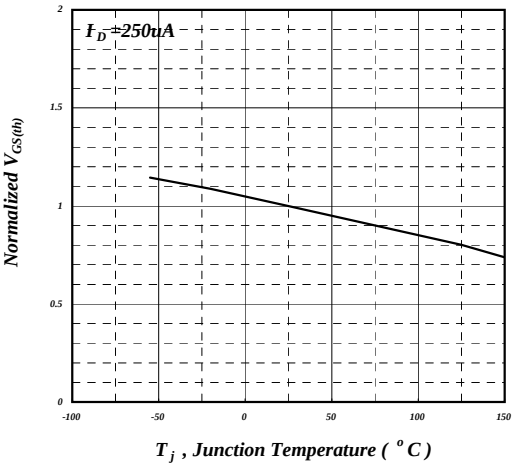


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

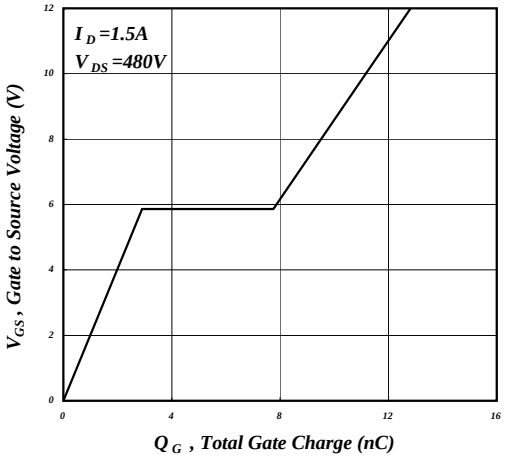


Fig 7. Gate Charge Characteristics

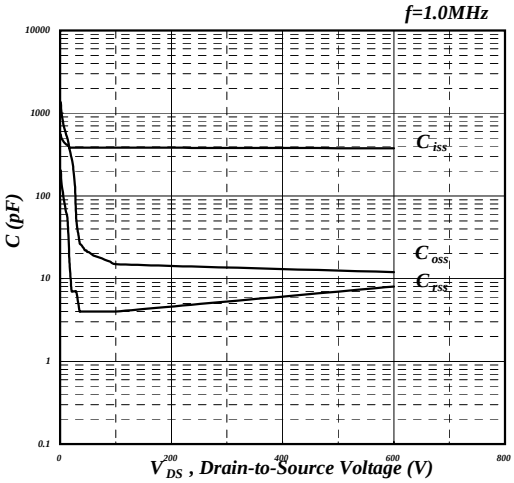


Fig 8. Typical Capacitance Characteristics

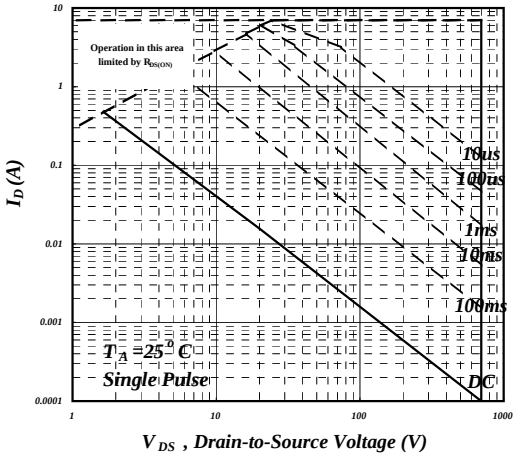


Fig 9. Maximum Safe Operating Area

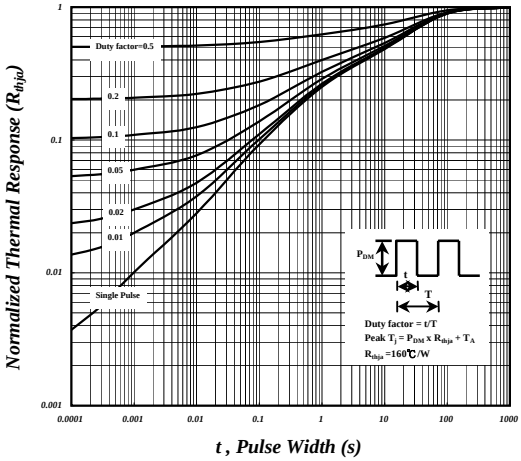


Fig10. Effective Transient Thermal Impedance

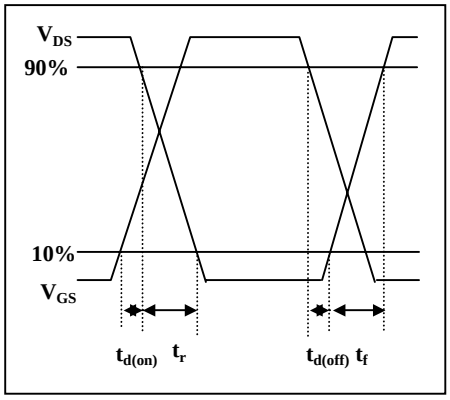


Fig 11. Switching Time Waveform

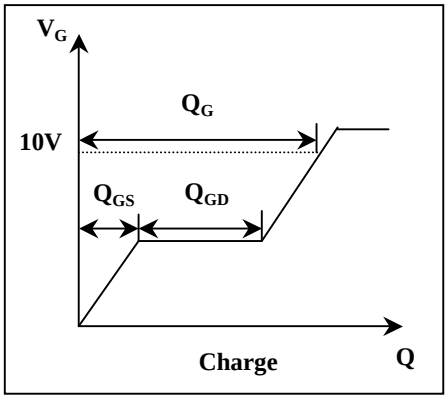


Fig 12. Gate Charge Waveform

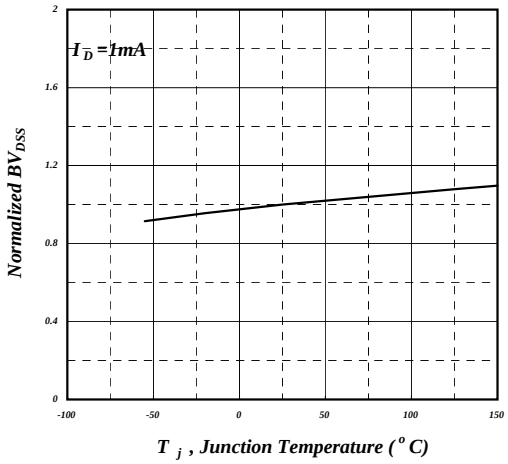


Fig 13. Normalized BV_{DSS} v.s. Junction Temperature

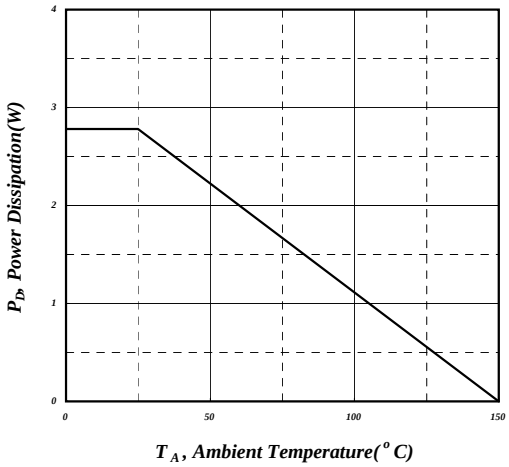


Fig 14. Total Power Dissipation

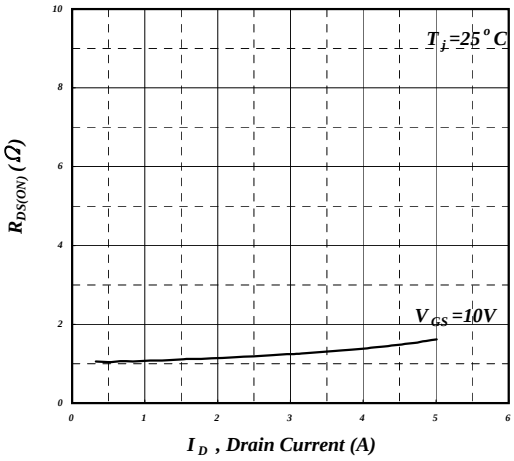


Fig 15. Typ. Drain-Source on State Resistance

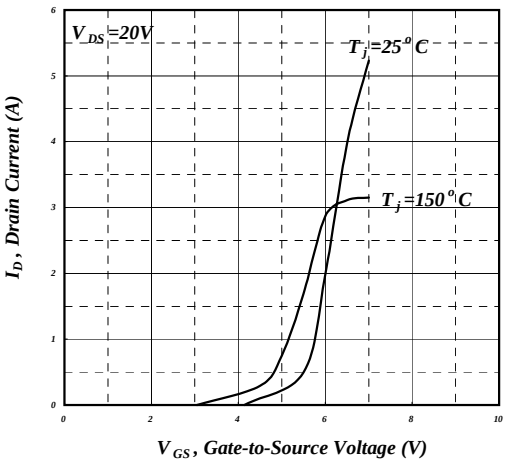
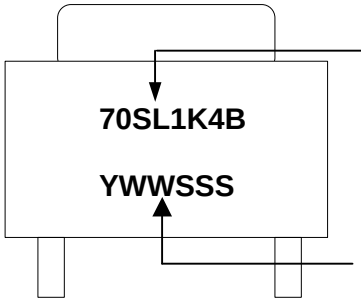


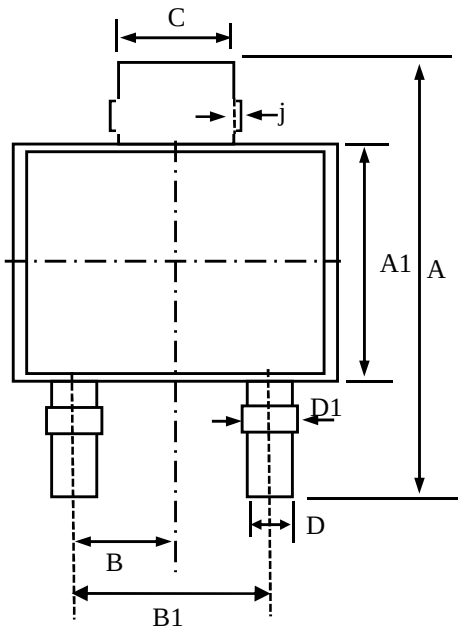
Fig 16. Transfer Characteristics

MARKING INFORMATION

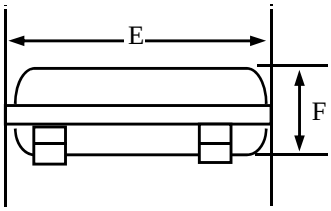


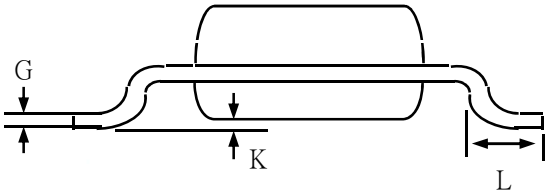
Y：Last Digit Of The Year
WW：Week
SSS：Sequence

Package Outline : SOT-223-2L



SYMBOLS	Millimeters		
	MIN	NOM	MAX
A	6.70	7.00	7.30
B	---	2.30	---
B1	---	4.60	---
C	2.90	3.00	3.10
D	0.60	0.70	0.85
G	0.20	0.30	0.35
E	6.30	6.50	6.70
F	1.40	1.60	1.80
K	0.02	0.06	0.10
A1	3.30	3.50	3.70
L	0.50	0.75	1.00
D1	0.66	0.88	1.10
j			0.13





1.All Dimension Are In Millimeters.

2.Dimension Does Not Include Mold Protrusions.

Draw No. M1-K3-2L-G-v01

SOT-223-2L FOOTPRINT：