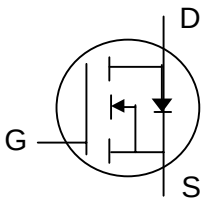
P-channel Enhancement-mode Power MOSFET

Simple Drive Reqirement

Low Gate Charge

Fast Switching Characteristics

RoHS-compliant, Halogen-free

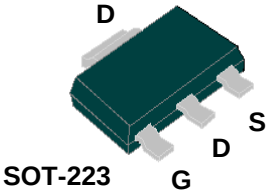


BV_{DSS}	-60V
$R_{DS(ON)}$	250mΩ
I_D	-2.4A

Description

Advanced Power MOSFETs from APEC provide the designer with the best combination of fast switching, low on-resistance and cost-effectiveness.

The AP2311GK-HF-3 is in the popular SOT-223 small surface-mount package which is widely used in commercial and industrial applications where a small board footprint is required.
This device is well suited for use in medium current applications such as load switches.



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-60	V
V_{GS}	Gate-Source Voltage	±20	V
I_D at T_A=25°C	Continuous Drain Current [3]	-2.4	A
I_D at T_A= 70°C	Continuous Drain Current[3]	-2	A
I_{DM}	Pulsed Drain Current[1]	-10	A
P_D at T_A=25°C	Total Power Dissipation	2.78	W
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Data

Symbol	Parameter	Value	Unit
Rthj-a	Maximum Thermal Resistance, Junction-ambient	45	°C/W

Ordering Information

AP2311GK-HF-3TR RoHS-compliant halogen-free SOT-223, shipped on tape and reel, 3000pcs/reel

Electrical Specifications at 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	-60	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=-10V, I_D=-1.8A	-	-	250	mΩ
		V_{GS}=-4.5V, I_D=-1.4A	-	-	300	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=-250uA	-1	-	-3	V
g_{fs}	Forward Transconductance	V_{DS}=-10V, I_D=-1A	-	2	-	S
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-48V, V_{GS}=0V	-	-	-25	uA
I_{GSS}	Gate-Source Leakage	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Q_g	Total Gate Charge	I_D=-1A	-	6	9.6	nC
Q_{gs}	Gate-Source Charge	V_{DS}=-48V	-	1	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	V_{GS}=-4.5V	-	3	-	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=-30V	-	8	-	ns
t_r	Rise Time	I_D=-1A	-	5	-	ns
$t_{d(off)}$	Turn-off Delay Time	R_G=3.3Ω	-	22	-	ns
t_f	Fall Time	V_{GS}=-10V	-	3	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V	-	510	816	pF
C_{oss}	Output Capacitance	V_{DS}=-25V	-	50	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	40	-	pF

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage[2]	I_S=-1.2A, V_{GS}=0V	-	-	-1.2	V
t_{rr}	Reverse Recovery Time	I_S=-1A, V_{GS}=0V,	-	30	-	ns
Q_{rr}	Reverse Recovery Charge	dI/dt=100A/μs	-	38	-	nC

Notes:

1. Pulse width limited by maximum junction temperature.
2. Pulse test - pulse width ≤ 300μs , duty cycle ≤ 2%
3. Surface mounted on 1in^2 copper pad of FR4 board, t ≤10sec; 120°C/W when mounted on minimum copper pad.

Typical Electrical Characteristics

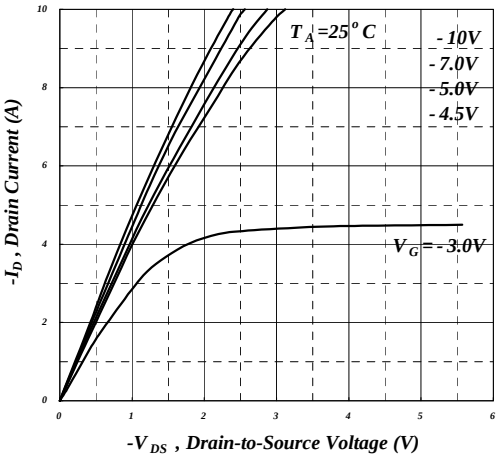


Fig 1. Typical Output Characteristics

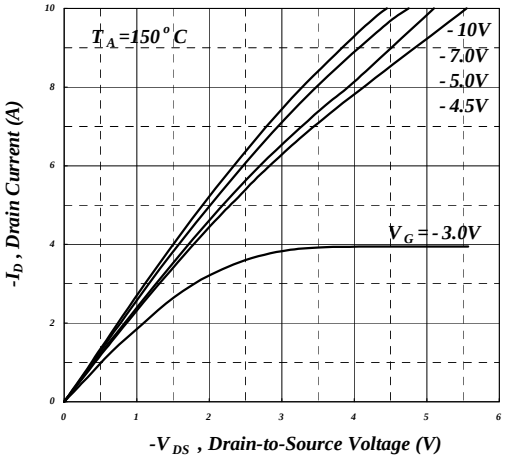


Fig 2. Typical Output Characteristics

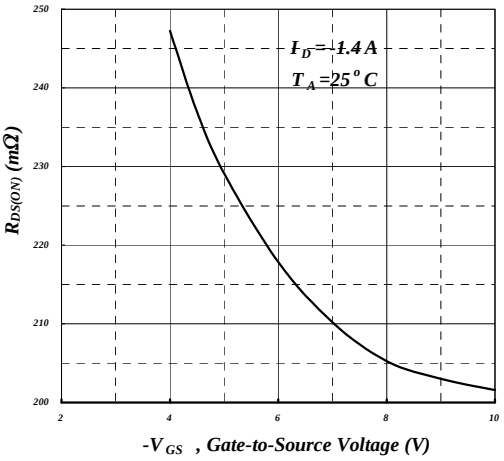


Fig 3. On-Resistance vs. Gate Voltage

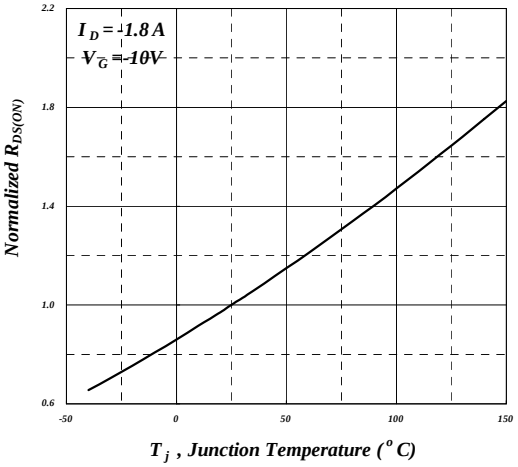


Fig 4. Normalized On-Resistance vs. Junction Temperature

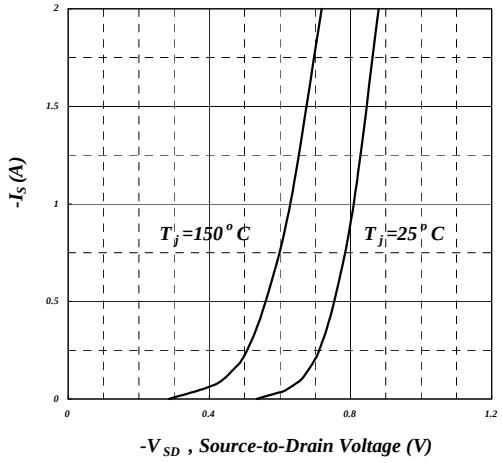


Fig 5. Forward Characteristic of Reverse Diode

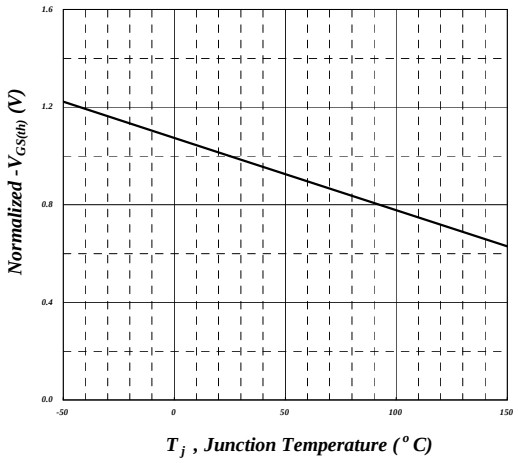


Fig 6. Gate Threshold Voltage vs. Junction Temperature

Typical Electrical Characteristics (cont.)

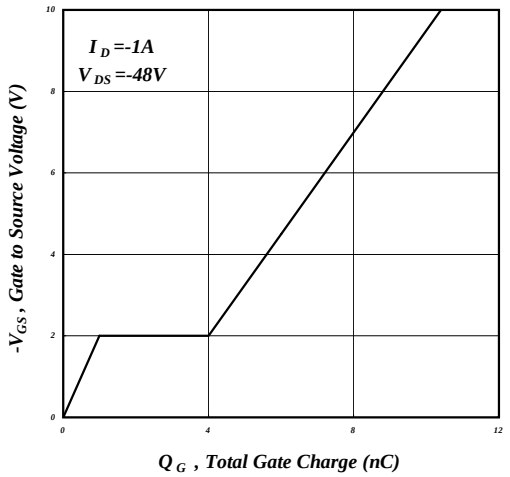


Fig 7. Gate Charge Characteristics

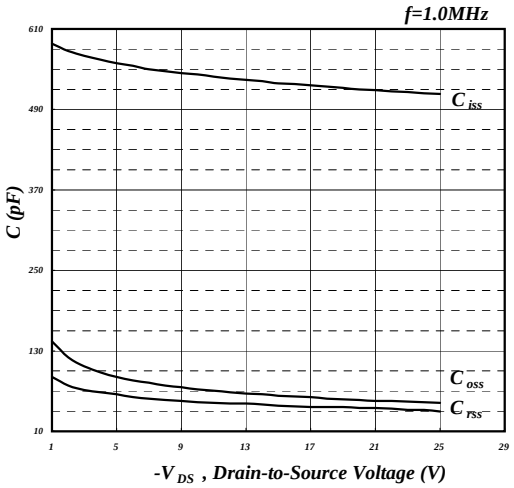


Fig 8. Typical Capacitance Characteristics

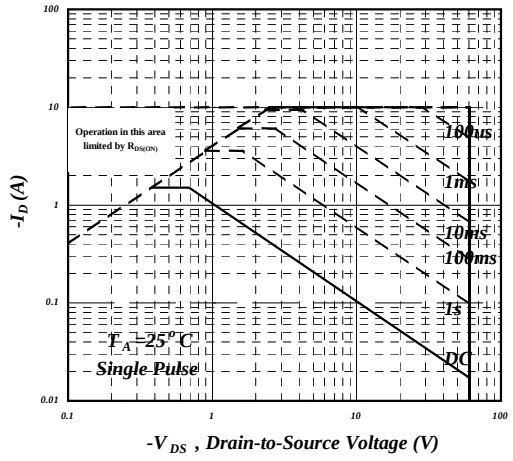


Fig 9. Maximum Safe Operating Area

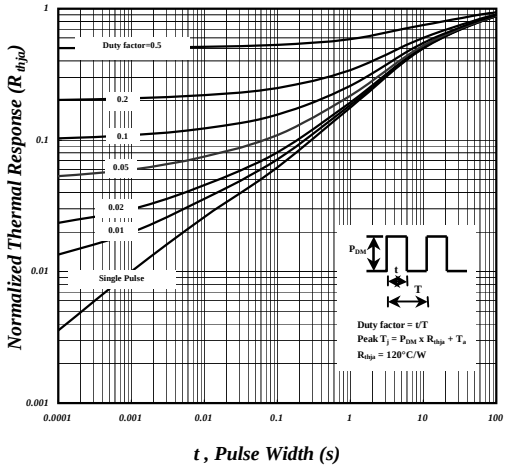


Fig 10. Effective Transient Thermal Impedance

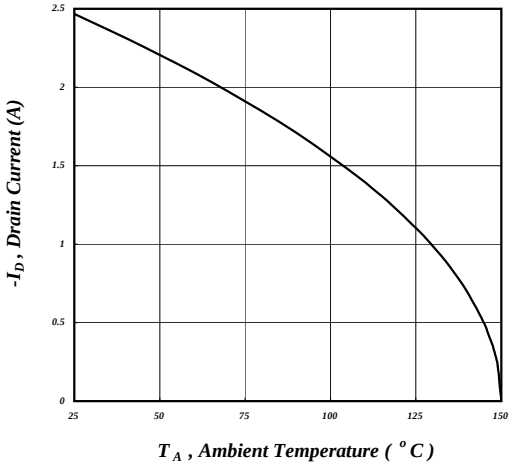


Fig 11. Maximum Continuous Drain Current vs. Ambient Temperature

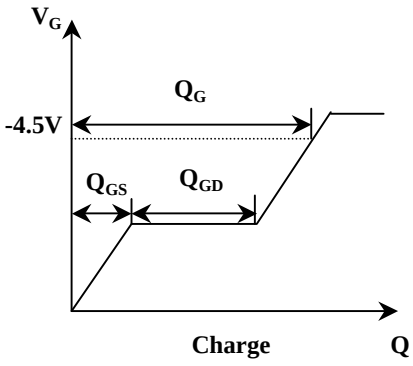
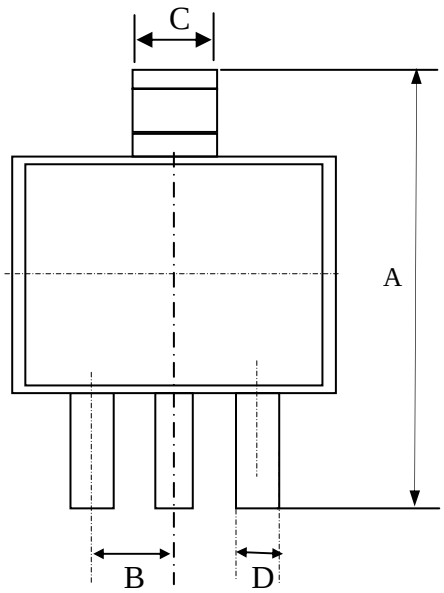
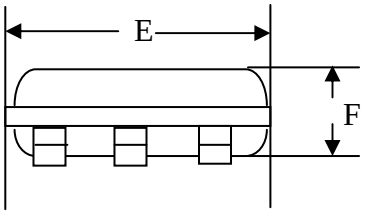


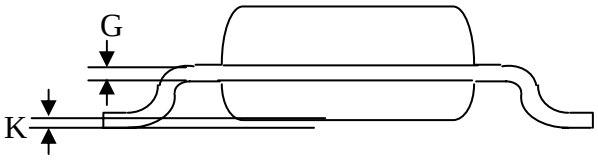
Fig 12. Gate Charge Waveform

Package Dimensions: SOT-223



	Millimeters		
SYMBOLS	MIN	NOM	MAX
A	6.70	7.00	7.30
B	---	2.3	---
C	2.90	3.00	3.10
D	0.60	0.70	0.80
G	0.25	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





1. All dimensions are in millimeters.
2. Dimensions do not include mold protrusions.

Marking Information: