



**Advanced Power
Electronics Corp.**

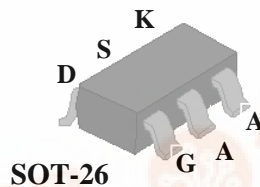
AP6924GEY

Pb Free Plating Product

N-CHANNEL MOSFET WITH SCHOTTKY

DIODE

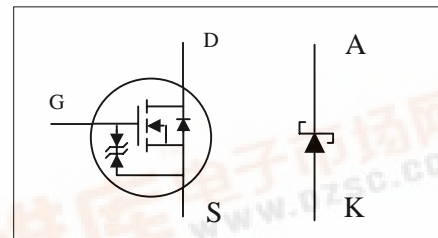
- ▼ Low On-Resistance
- ▼ Fast Switching Characteristic
- ▼ Included Schottky Diode



BV_{DSS}	20V
$R_{DS(ON)}$	600m Ω
I_D	1A

Description

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



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage (MOSFET)	20	V
V_{KA}	Reverse Voltage (Schottky)	20	V
V_{GS}	Gate-Source Voltage (MOSFET)	± 6	V
$I_D @ T_A=25^\circ C$	Continuous Drain Current ³ (MOSFET)	1	A
$I_D @ T_A=70^\circ C$	Continuous Drain Current ³ (MOSFET)	0.8	A
I_{DM}	Pulsed Drain Current ¹ (MOSFET)	8	A
I_F	Average Forward Current (Schottky)	0.5	A
I_{FM}	Pulsed Forward Current ¹ (Schottky)	2	A
$P_D @ T_A=25^\circ C$	Total Power Dissipation (MOSFET)	0.9	W
	Total Power Dissipation (Schottky)	0.9	W
T_{STG}	Storage Temperature Range	-55 to 125	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 125	$^\circ C$

Thermal Data

Symbol	Parameter	Value	Units
R_{thj-a}	Thermal Resistance Junction-ambient ³ (MOSFET)	Max. 110	$^\circ C/W$
	Thermal Resistance Junction-ambient ³ (Schottky)	Max. 110	$^\circ C/W$



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	20	-	-	V
ΔBV _{DSS} /ΔT _j	Breakdown Voltage Temperature Coefficient	Reference to 25°C, I _D =1mA	-	0.02	-	V/°C
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =4.5V, I _D =1A	-	-	600	mΩ
		V _{GS} =2.5V, I _D =0.5A	-	-	850	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	0.5	-	1.2	V
g _{fs}	Forward Transconductance	V _{DS} =5V, I _D =600mA	-	1	-	S
I _{DSS}	Drain-Source Leakage Current (T _j =25°C)	V _{DS} =20V, V _{GS} =0V	-	-	1	uA
	Drain-Source Leakage Current (T _j =70°C)	V _{DS} =16V, V _{GS} =0V	-	-	10	uA
I _{GSS}	Gate-Source Leakage	V _{GS} =±6V	-	-	±10	uA
Q _g	Total Gate Charge ²	I _D =600mA	-	1.3	2	nC
Q _{gs}	Gate-Source Charge	V _{DS} =16V	-	0.3	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge	V _{GS} =4.5V	-	0.5	-	nC
t _{d(on)}	Turn-on Delay Time ²	V _{DS} =10V	-	21	-	ns
t _r	Rise Time	I _D =600mA	-	53	-	ns
t _{d(off)}	Turn-off Delay Time	R _G =3.3Ω, V _{GS} =5V	-	100	-	ns
t _f	Fall Time	R _D =16.7Ω	-	125	-	ns
C _{iss}	Input Capacitance	V _{GS} =0V	-	38	60	pF
C _{oss}	Output Capacitance	V _{DS} =10V	-	17	-	pF
C _{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	12	-	pF

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V _{SD}	Forward On Voltage ²	I _S =750mA, V _{GS} =0V	-	-	1.2	V

Schottky Characteristics @T_j=25°C

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V _F	Forward Voltage Drop	I _F =500mA	-	-	0.5	V
I _{rm}	Maximum Reverse Leakage Current	V _r =20V	-	-	100	uA
C _T	Junction Capacitance	V _r =10V	-	21	-	pF

Notes:

- 1.Pulse width limited by Max. junction temperature.
- 2.Pulse width ≤300us , duty cycle ≤2%.
- 3.Surface mounted on 1 in² copper pad of FR4 board, t_{sec}≤5sec ; 180°C/W when mounted on min. copper pad.



MOSFET

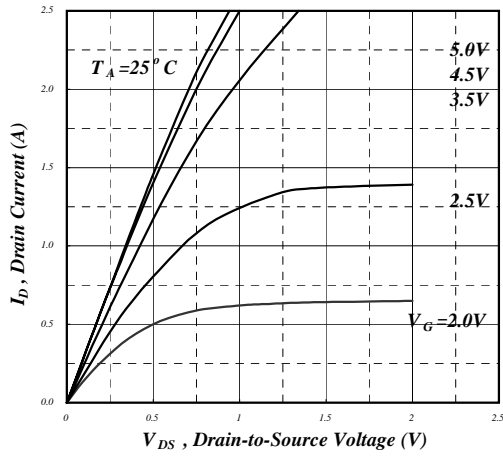


Fig 1. Typical Output Characteristics

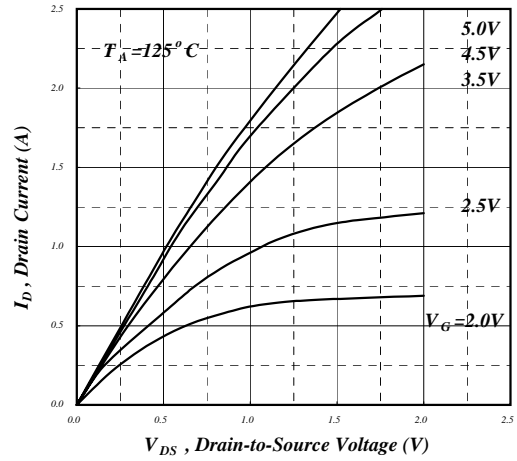


Fig 2. Typical Output Characteristics

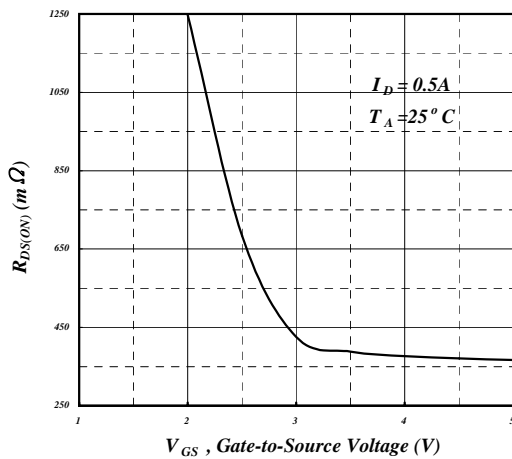


Fig 3. On-Resistance v.s. Gate Voltage

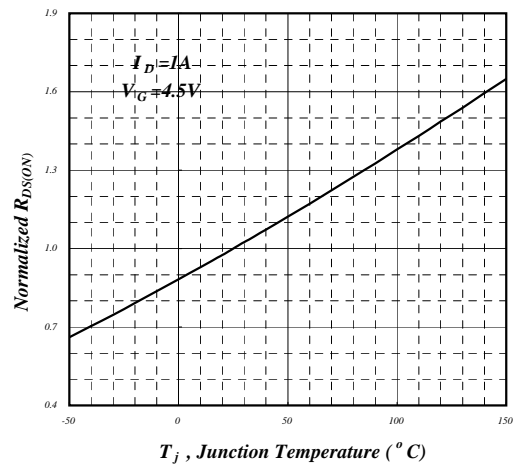


Fig 4. Normalized On-Resistance v.s. Junction Temperature

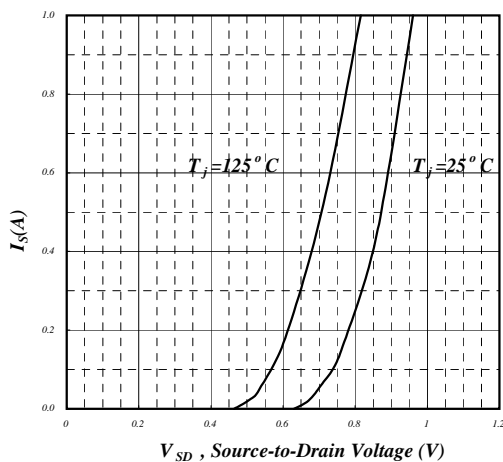


Fig 5. Forward Characteristic of Reverse Diode

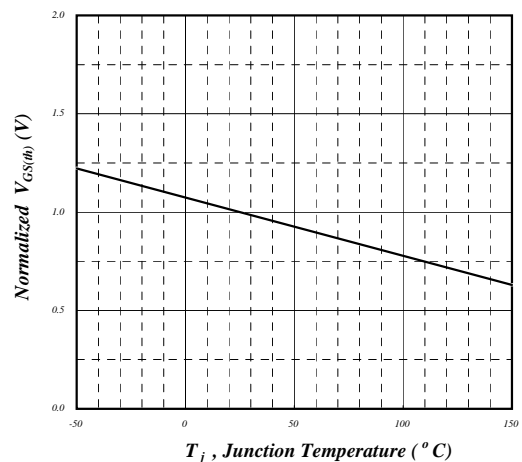


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

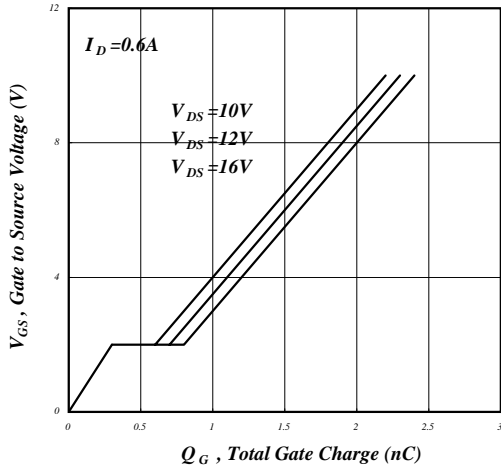


Fig 7. Gate Charge Characteristics

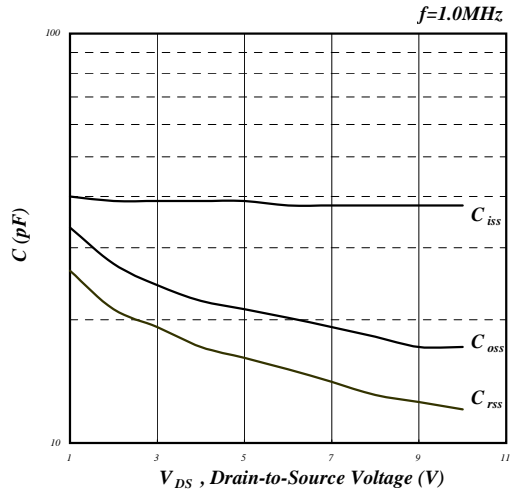


Fig 8. Typical Capacitance Characteristics

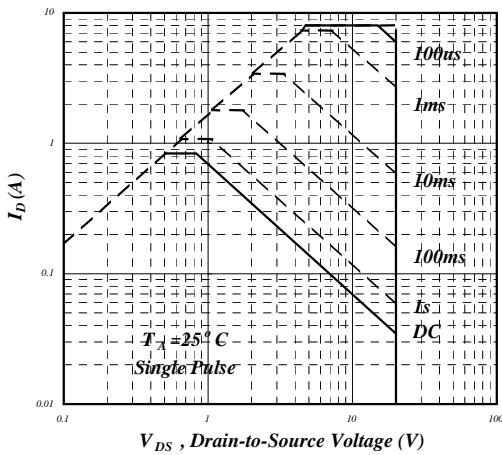


Fig 9. Maximum Safe Operating Area

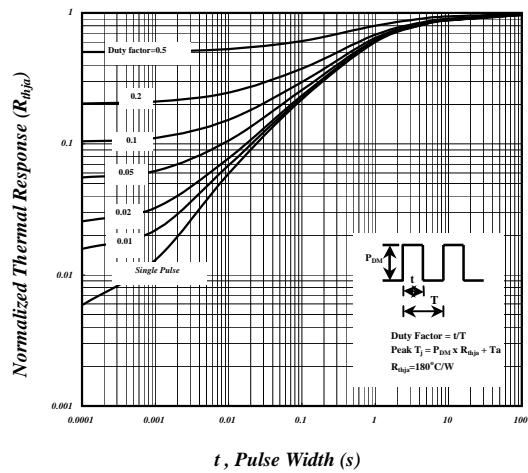


Fig 10. Effective Transient Thermal Impedance

SCHOTTKY DIODE

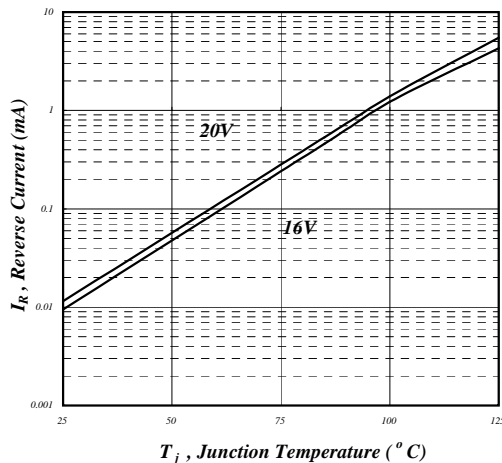


Fig 1. Reverse Leakage Current v.s. Junction Temperature

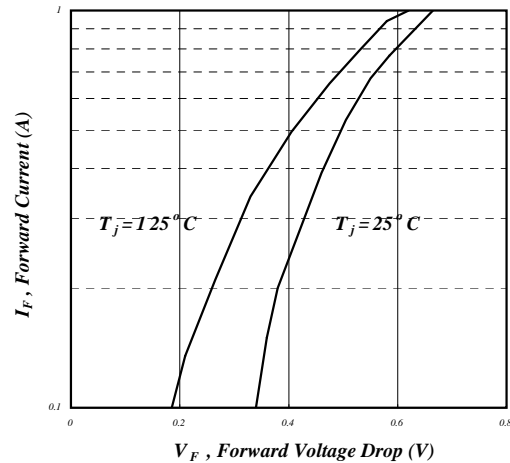


Fig 2. Forward Voltage Drop