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GT6924E

N-CHANNEL MOSFET WITH SCHOTTKY DIODE

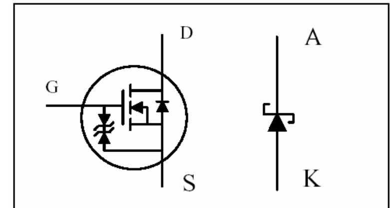
BVDSS	20V
RDS(ON)	600mΩ
ID	1A

Description

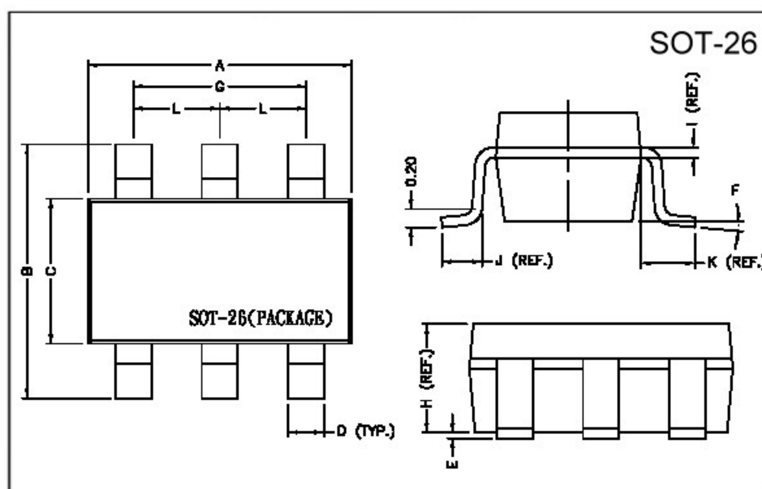
The GM2306 provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

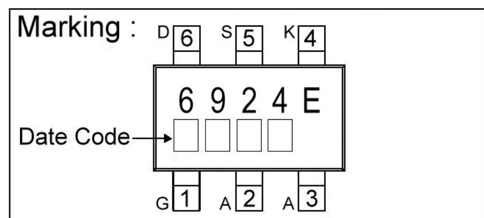
Features

*Lower on-resistance
*Fast Switching Characteristic
*Included Schottky Diode



Package Dimensions





REF.	Millimeter		REF.	Dimensions
	Min.	Max.		Millimeter
A	2.70	3.10	G	1.90 REF.
B	2.60	3.00	H	1.20 REF.
C	1.40	1.80	I	0.12 REF.
D	0.30	0.55	J	0.37 REF.
E	0	0.10	K	0.60 REF.
F	0°	10°	L	0.95 REF.

Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage (MOSFET)	V_{DS}	20	V
Gate-Source Voltage (MOSFET)	V_{GS}	± 6	V
Continuous Drain Current[3] (MOSFET)	I_D @TA=25℃	1.0	A
Continuous Drain Current[3] (MOSFET)	I_D @TA=70℃	0.8	A
Pulsed Drain Current[1] (MOSFET)	I_{DM}	8	A
Reverse Voltage (Schottky)	V_{KA}	20	V
Average Forward Current (Schottky)	I_F	0.5	A
Pulsed Forward Current[1] (Schottky)	I_{FM}	2.0	A
Total Power Dissipation (MOSFET)	P_D @TA=25℃	0.9	W
Total Power Dissipation (Schottky)		0.9	W
Operating Junction and Storage Temperature Range	Tj, Tstg	-55 ~ +125	℃

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-ambient[3] (MOSFET) Max.	Rthj-a	110	℃/W
Thermal Resistance Junction-ambient[3] (Schottky) Max.		110	℃/W

Electrical Characteristics (Tj = 25℃ unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	BV_{DSS}	20	-	-	V	V_{GS}=0, I_D=250uA
Breakdown Voltage Temperature Coefficient	$\triangle BV_{DSS}/\triangle Tj$	-	0.02	-	V/℃	Reference to 25℃, I_D=1mA
Gate Threshold Voltage	$V_{GS(th)}$	0.5	-	1.2	V	V_{DS}=V_{GS}, I_D=250uA
Forward Transconductance	g_{fs}	-	1	-	S	V_{DS}=5V, I_D=600mA
Gate-Source Leakage Current	I_{GSS}	-	-	±10	uA	V_{GS}= ± 6V
Drain-Source Leakage Current(Tj=25℃)	I_{DSS}	-	-	1	uA	V_{DS}=20V, V_{GS}=0
Drain-Source Leakage Current(Tj=70℃)		-	-	10	uA	V_{DS}=16V, V_{GS}=0
Static Drain-Source On-Resistance	$R_{DS(ON)}$	-	-	600	mΩ	V_{GS}=4.5V, I_D=1A
		-	-	850		V_{GS}=2.5V, I_D=0.5A
Total Gate Charge[2]	Q_g	-	1.3	2	nC	I_D=600mA V_{DS}=16V V_{GS}=4.5V
Gate-Source Charge	Q_{gs}	-	0.3	-		
Gate-Drain (“Miller”) Change	Q_{gd}	-	0.5	-		
Turn-on Delay Time[2]	$T_{d(on)}$	-	21	-	Ns	V_{DS}=10V I_D=600mA V_{GS}=5V R_G=3.3Ω R_D=16.7Ω
Rise Time	T_r	-	53	-		
Turn-off Delay Time	$T_{d(off)}$	-	100	-		
Fall Time	T_f	-	125	-		
Input Capacitance	C_{iss}	-	38	60	pF	V_{GS}=0V V_{DS}=10V f=1.0MHz
Output Capacitance	C_{oss}	-	17	-		
Reverse Transfer Capacitance	C_{rss}	-	12	-		

Source-Drain Diode

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Forward On Voltage[2]	V_{SD}	-	-	1.2	V	I_S=750mA, V_{GS}=0V

Schottky Characteristics (Tj = 25℃)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Forward Voltage Drop	V_F	-	-	0.5	V	I_F=500mA
Maximum Reverse Leakage Current	I_{RM}	-	-	100	uA	V_R=20V
Junction Capacitance	C_T	-	21	-	pF	V_R=10V

Notes: 1. Pulse width limited by Max. junction temperature.

2. Pulse width≦300us, duty cycle≦2%.

3. Surface mounted on 1 in^2 copper pad of FR4 board, t≦5sec; 180℃/W when mounted on Min. copper pad.

MOSFET Characteristics Curve

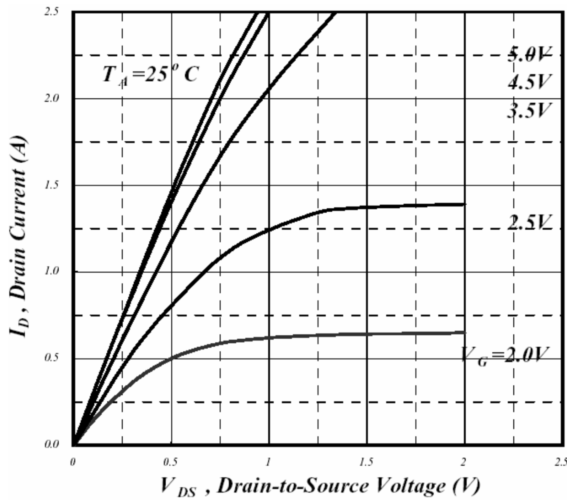


Fig 1. Typical Output Characteristics

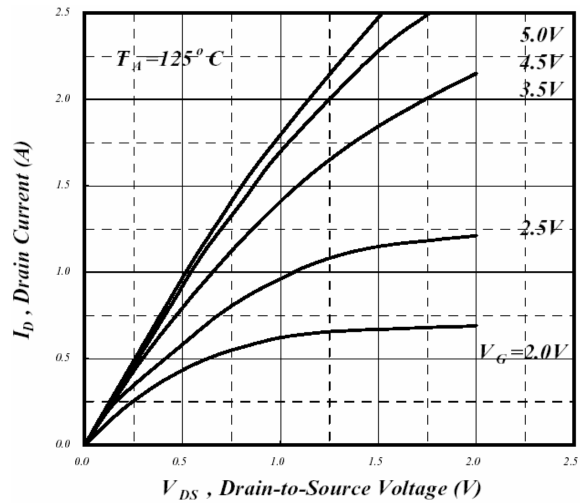


Fig 2. Typical Output Characteristics

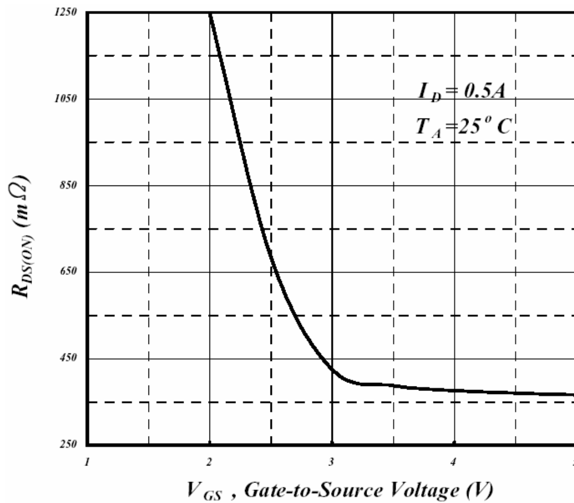


Fig 3. On-Resistance v.s. Gate Voltage

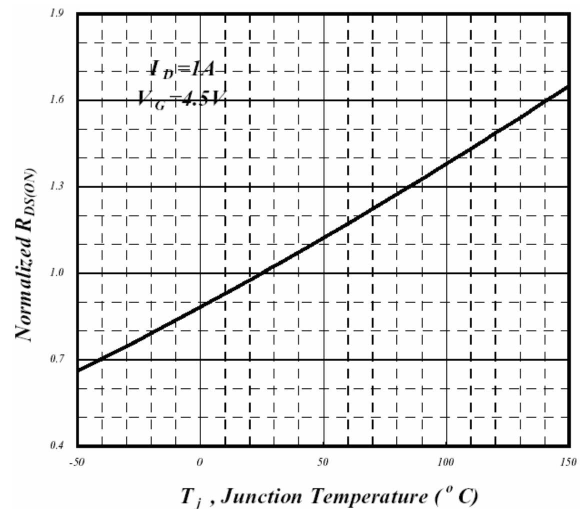


Fig 4. Normalized On-Resistance v.s. Junction Temperature

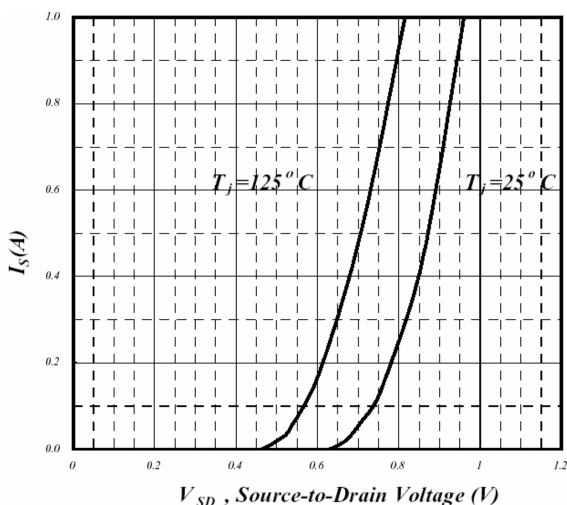


Fig 5. Forward Characteristics of Reverse Diode

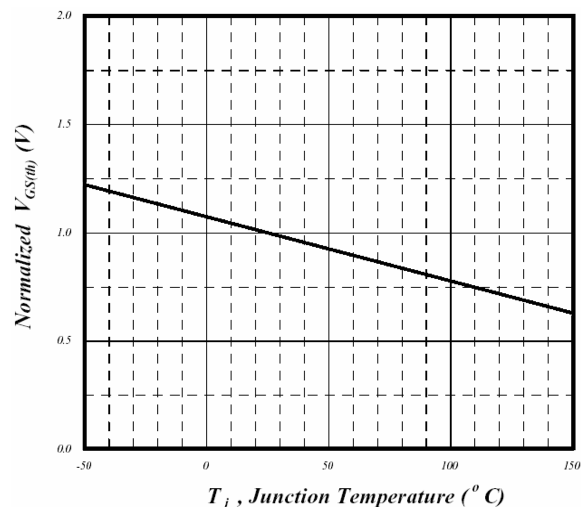


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

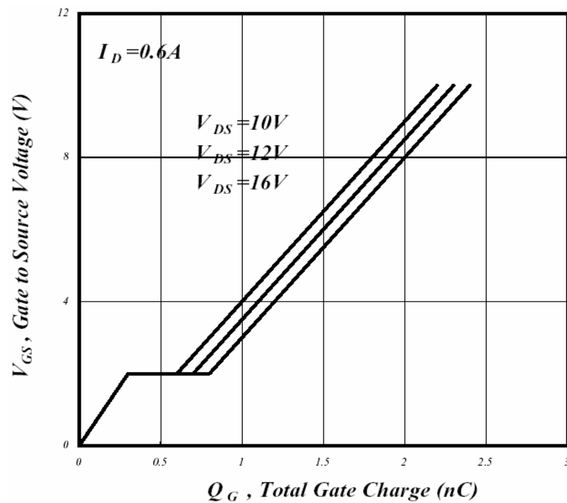


Fig 7. Gate Charge Characteristics

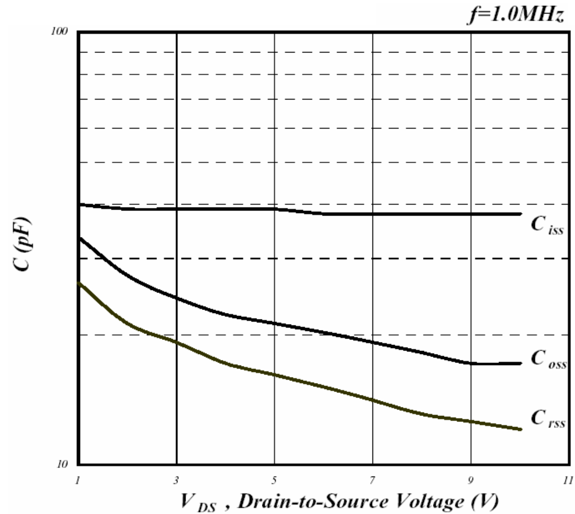


Fig 8. Typical Capacitance Characteristics

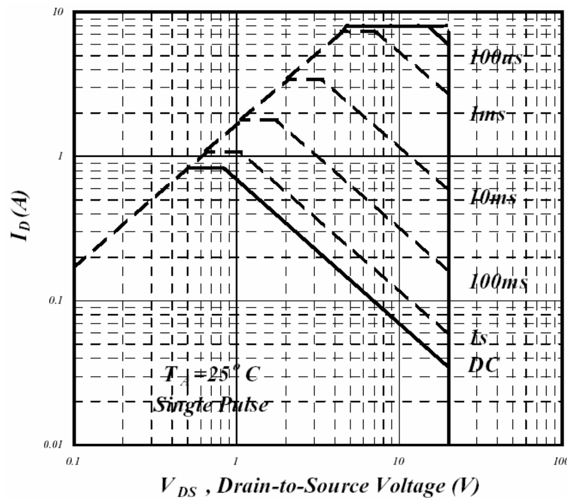


Fig 9. Maximum Safe Operating Area

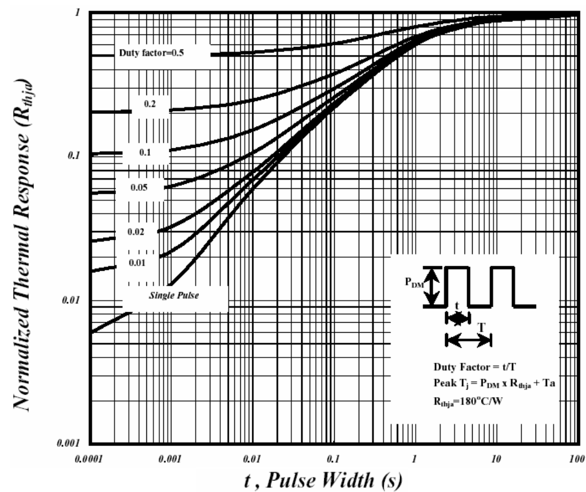


Fig 10. Effective Transient Thermal Impedance

Schottky Diode Characteristics Curve

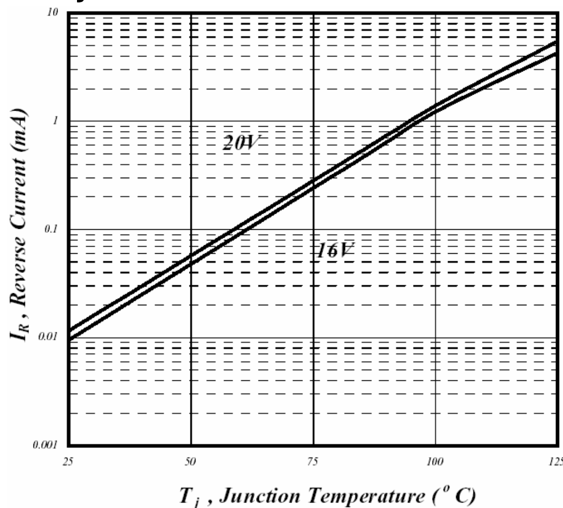


Fig 1. **Reverse Leakage Current v.s. Junction Temperature**

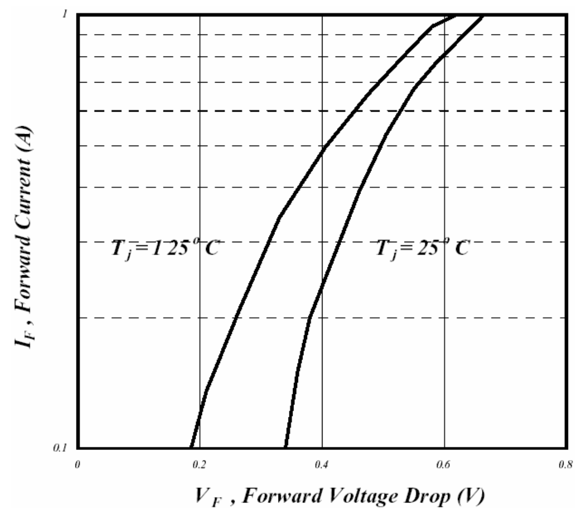


Fig 12. **Forward Voltage Drop**

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