Dual N-channel Enhancement-mode Power MOSFET

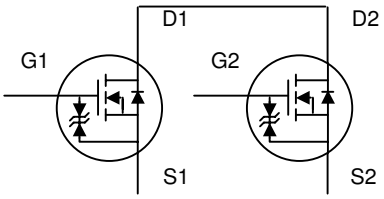
Common-drain, Symmetrical Dual MOSFETs

Supports 1.8V Gate Drive

Low On-resistance

Ideal for Battery Applications

RoHS-compliant, halogen-free

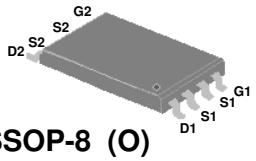


BV_{DSS}	20V
$R_{DS(ON)}$	18mΩ
I_D	6A

Description

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

The TSSOP-8 package is widely used for commercial and industrial applications, where space is at a premium.



TSSOP-8 (O)

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	±8	V
I_D at T_A=25℃	Continuous Drain Current[3]	6	A
I_D at T_A=70℃	Continuous Drain Current[3]	4.8	A
I_{DM}	Pulsed Drain Current[1]	20	A
P_D at T_A=25℃	Total Power Dissipation	1	W
	Linear Derating Factor	0.008	W/℃
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Value	Unit
Rthj-a	Maximum Thermal Resistance, Junction-ambient	125	℃/W

Ordering Information

AP9938GEO-HF-3TR : in RoHS-compliant halogen-free TSSOP-8 shipped on tape and reel (3000pcs/reel)

Electrical Specifications at T_j=25℃ (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
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=4.5V, I_D=6A	-	-	18	mΩ
		V_{GS}=2.5V, I_D=4A	-	-	24	mΩ
		V_{GS}=1.8V, I_D=2A	-	-	28	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	0.3	-	1	V
g_{fs}	Forward Transconductance	V_{DS}=5V, I_D=6A	-	28	-	S
I_{DSS}	Drain-Source Leakage Current	V_{DS}=16V, V_{GS}=0V	-	-	10	uA
I_{GSS}	Gate-Source Leakage	V_{GS}=±8V, V_{DS}=0V	-	-	±30	uA
Q_g	Total Gate Charge	I_D=6A	-	16	26	nC
Q_{gs}	Gate-Source Charge	V_{DS}=10V	-	1.6	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	V_{GS}=4.5V	-	4.3	-	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=10V	-	7	-	ns
t_r	Rise Time	I_D=1A	-	11	-	ns
$t_{d(off)}$	Turn-off Delay Time	R_G=3.3Ω	-	31	-	ns
t_f	Fall Time	V_{GS}=5V	-	6	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V	-	1070	1710	pF
C_{oss}	Output Capacitance	V_{DS}=10V	-	130	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	115	-	pF
R_g	Gate Resistance	f=1.0MHz	-	1.4	2.8	Ω

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=6A, V_{GS}=0V,	-	14	-	ns
Q_{rr}	Reverse Recovery Charge	dI/dt=100A/μs	-	4	-	nC

Notes:

1.Pulse width limited by the maximum junction temperature.

2.Pulse test - pulse width ≤ 300μs , duty cycle ≤ 2%

3.Surface mounted on 1 in^2 copper pad of FR4 board; 208℃/W when mounted on minimum copper pad.

Typical Electrical Characteristics

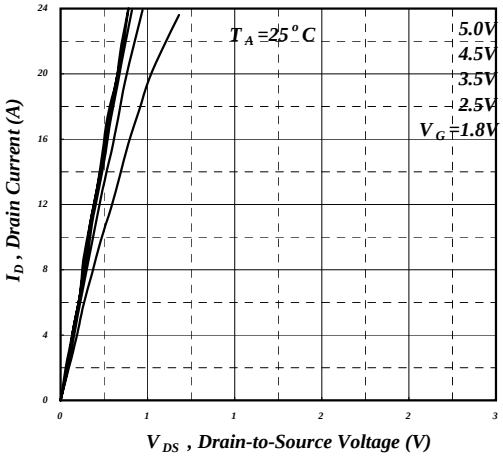


Fig 1. Typical Output Characteristics

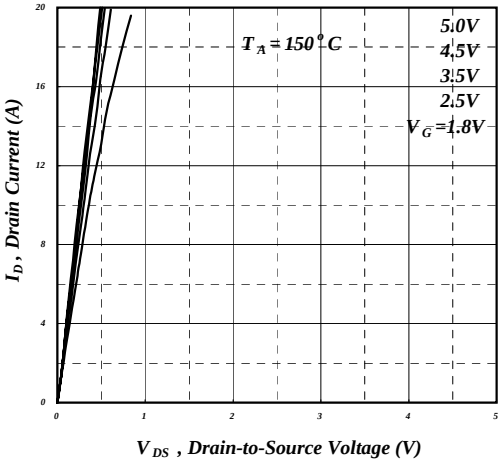


Fig 2. Typical Output Characteristics

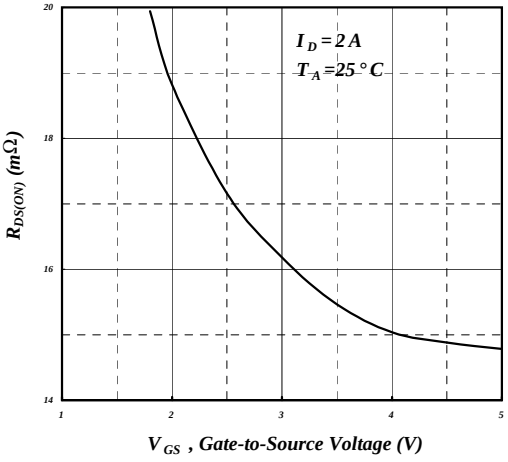


Fig 3. On-Resistance vs. Gate Voltage

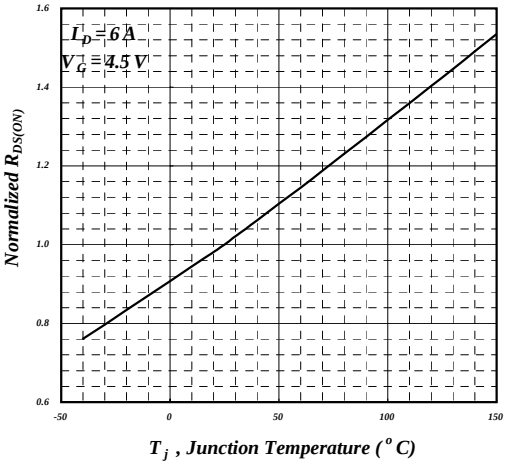


Fig 4. Normalized On-Resistance vs. Junction Temperature

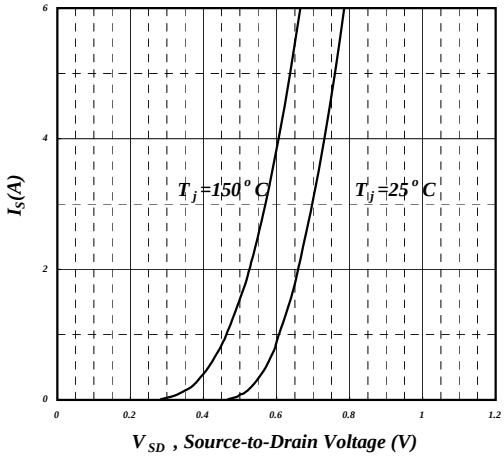


Fig 5. Forward Characteristic of Reverse Diode

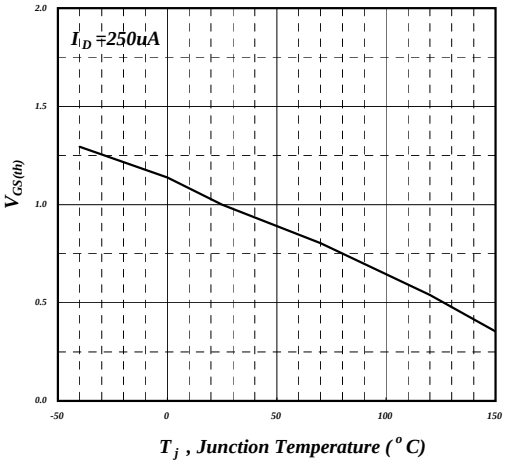


Fig 6. Gate Threshold Voltage vs. Junction Temperature

Typical Electrical Characteristics (cont.)

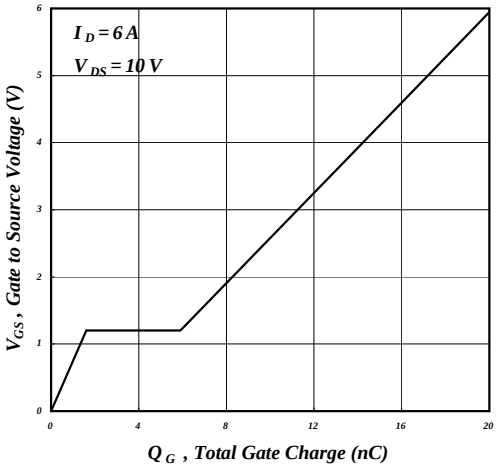


Fig 7. Gate Charge Characteristics

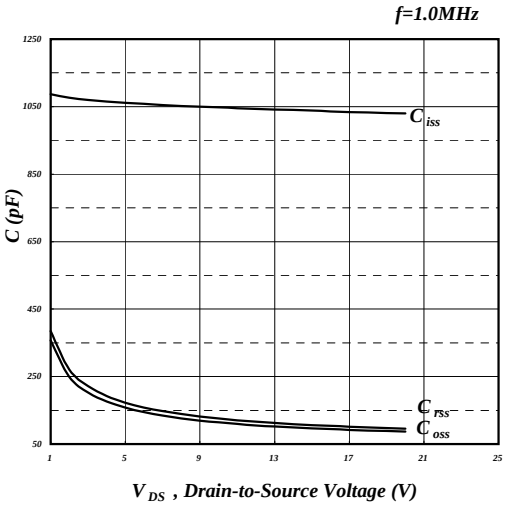


Fig 8. Typical Capacitance Characteristics

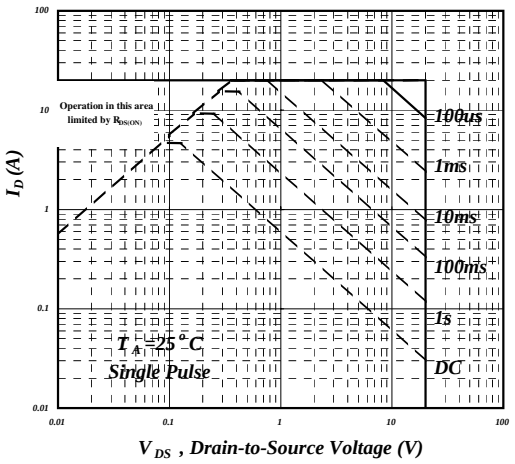


Fig 9. Maximum Safe Operating Area

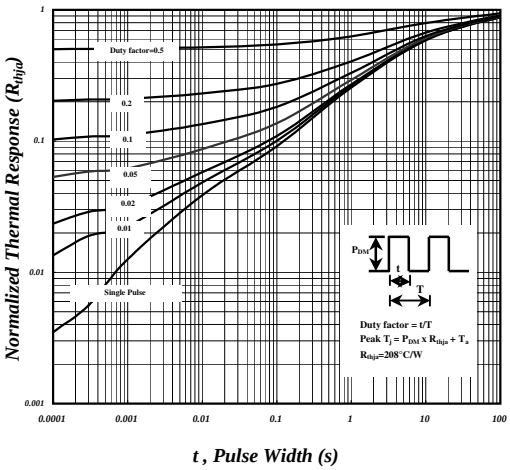


Fig 10. Effective Transient Thermal Impedance

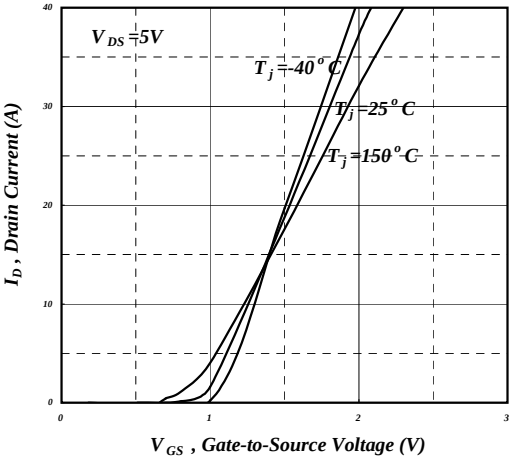


Fig 11. Transfer Characteristics

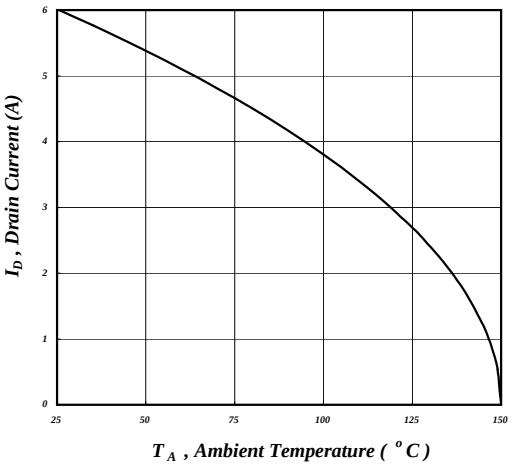
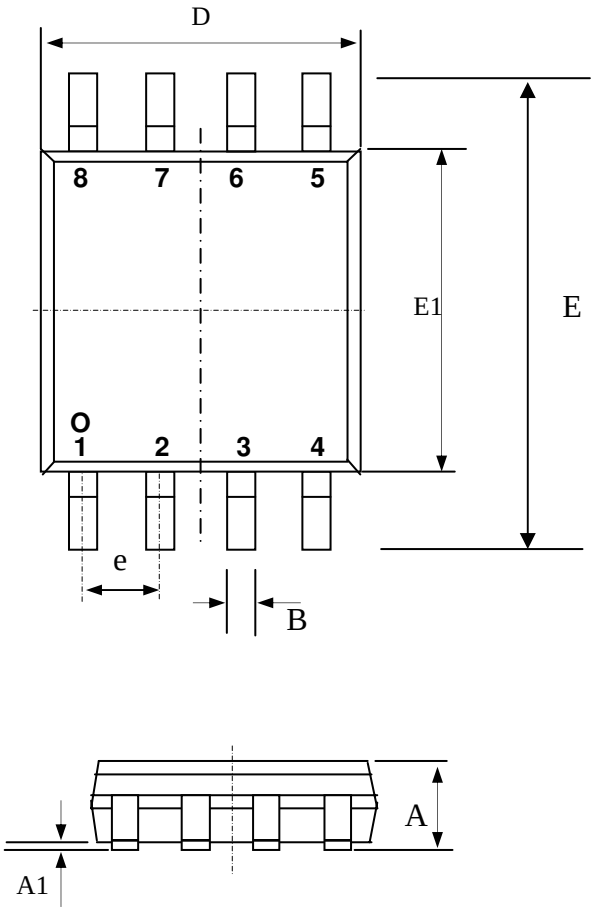


Fig 12. Maximum Continuous Drain Current vs. Ambient Temperature

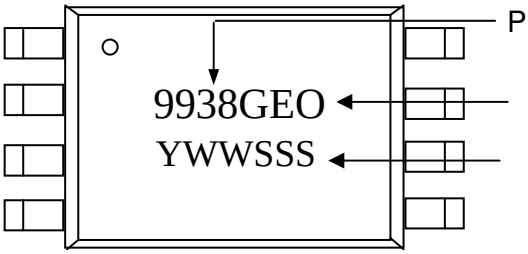
Package Dimensions: TSSOP-8



	Millimeters		
SYMBOLS	MIN	NOM	MAX
A	---	---	1.20
A1	0.05	---	0.15
B	0.19	---	0.30
C	---	0.127	----
D	2.90	3.00	3.10
E	6.20	6.40	6.60
E1	4.30	4.40	4.50
L	0.45	0.60	0.75
e	0.65 REF.		
θ	0°	----	8°

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

Marking Information:



Product: AP9938

GEO = RoHS-compliant halogen-free TSSOP-8 with Gate ESD protection

YWWSSS = Date/lot code

YWW = Year and work week of manufacture.
SSS = Lot code information.