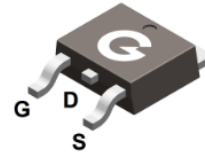
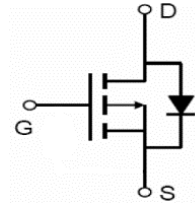


Features

- Super low gate charge
- 100% E_{AS} guaranteed
- Excellent C_{av}/d_t effect decline
- Advanced high cell density Trench technology
- Halogen free
- Qualified to AEC-Q101 standards for high reliability

HF



TO-252

Mechanical Data

- Case: TO-252
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
TBL950P10D	TO-252	80 pcs / Tube or 2500 pcs / Tape & Reel	950P10D

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

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V _{DSS}	-100	V
Gate-to-Source Voltage	V _{GSS}	±20	V
Continuous Drain Current (T _C = 25°C) * ¹	I _D	-30	A
Continuous Drain Current (T _C = 100°C) * ¹		-21	A
Pulsed Drain Current * ²	I _{DM}	-52	A
Single Pulse Avalanche Energy * ³	E _{AS}	110	mJ

Thermal Characteristics

Parameter	Symbol	Value	Unit
Power Dissipation (T _C = 25°C)	P _D	69.3	W
Thermal Resistance Junction-to-Case	R _{θJC}	1.8	°C/W
Operating Junction Temperature Range	T _J	-55 ~ +150	°C
Storage Temperature Range	T _{STG}	-55 ~ +150	°C

Electrical Characteristics (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
V _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = -250μA	-100	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = -100V, V _{GS} = 0V, T _C = 25°C	-	-	-50	μA
		V _{DS} = -100V, V _{GS} = 0V, T _C = 55°C	-	-	-60	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} = ±20V, V _{DS} = 0V	-	-	±100	nA
On Characteristics						
R _{DS(ON)}	Static Drain-Source On-resistance *2	V _{GS} = -10V, I _D = -12A	-	-	95	mΩ
		V _{GS} = -4.5V, I _D = -9A	-	-	115	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = -250μA	-1	-	-2.5	V
Dynamic Characteristics						
C _{ISS}	Input Capacitance	V _{GS} = 0V V _{DS} = -20V f = 1.0MHz	-	3029	-	pF
C _{OSS}	Output Capacitance		-	129	-	
C _{RSS}	Reverse Transfer Capacitance		-	76	-	
Switching Characteristics						
t _{d(ON)}	Turn-on Delay Time	V _{DD} = -50V I _D = -10A V _{GS} = -10V R _G = 3.3Ω	-	12	-	ns
t _r	Turn-on Rise Time		-	27.4	-	
t _{d(OFF)}	Turn-Off Delay Time		-	79	-	
t _f	Turn-Off Fall Time		-	53.6	-	
Q _G	Total Gate-Charge	V _{DS} = -50V I _D = -20A V _{GS} = -10V	-	44.5	-	nC
Q _{GS}	Gate to Source Charge		-	9.13	-	
Q _{GD}	Gate to Drain (Miller) Charge		-	5.93	-	
Source-Drain Diode Characteristics						
V _{SD}	Diode Forward Voltage	I _{SD} = -1A, V _{GS} = 0V	-	-	-1.2	V
I _S	Source-Drain Current(Body Diode) *1,4		-	-	-30	A
I _{SM}	Pulsed Source-Drain Current(Body Diode) *2, 4		-	-	-52	A
trr	Reverse Recovery Time	T _J = 25°C, I _F = -14A	-	38.7	-	nS
Qrr	Reverse Recovery Charge	di/dt = -100A/μs	-	22.4	-	nC

Notes:

- The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper
- The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
- The E_{AS} data shows Max. rating. The test condition is $V_{DD} = -25V, V_{GS} = -10V, L = 0.85mH$
- The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation

Ratings and Characteristics Curves (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

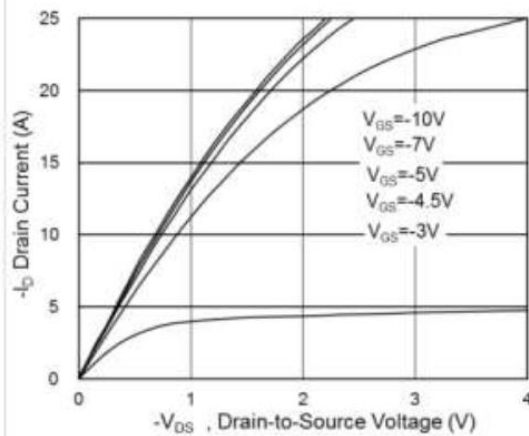


Fig.1 Typical Output Characteristics

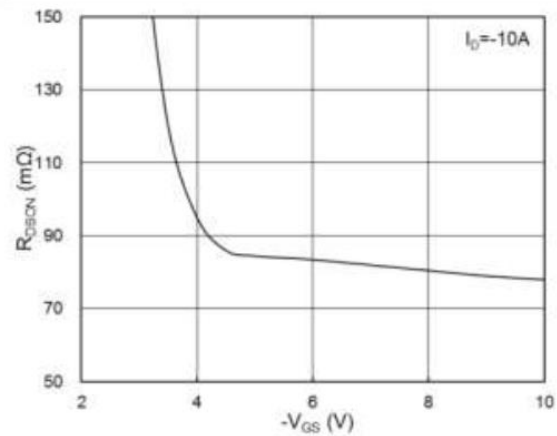


Fig.2 On-Resistance vs. G-S Voltage

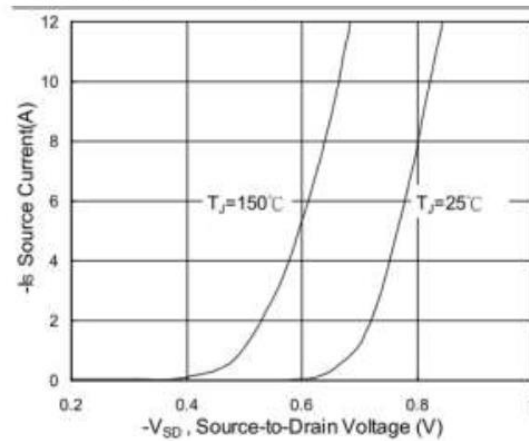


Fig.3 Forward Characteristics Of Reverse

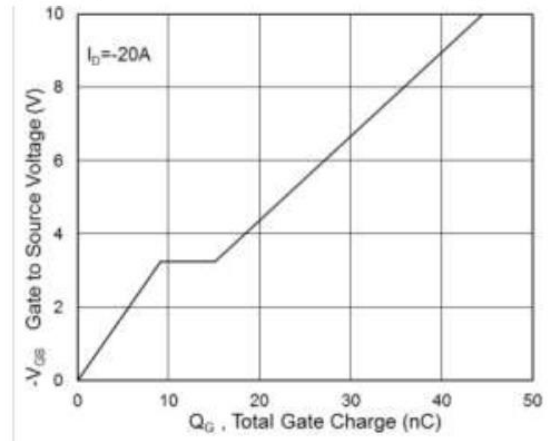


Fig.4 Gate-Charge Characteristics

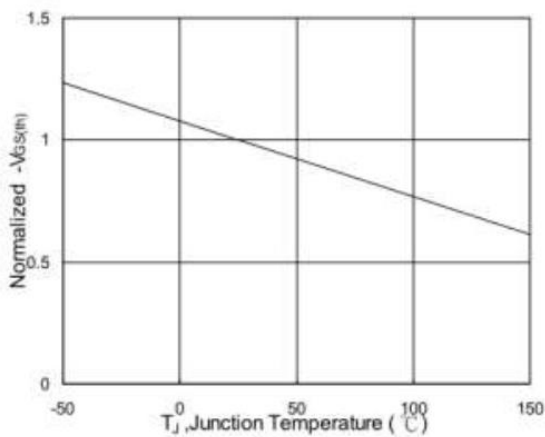


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

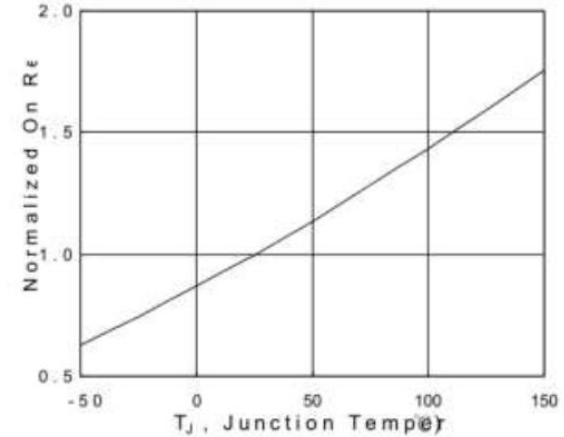


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

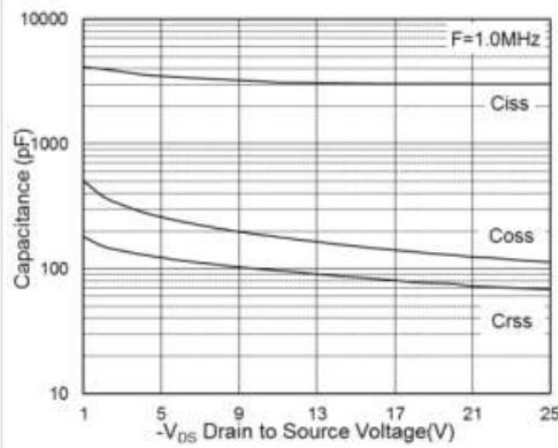


Fig.7 Capacitance

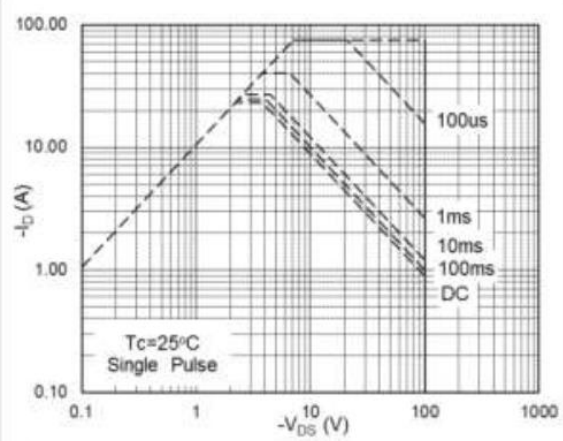
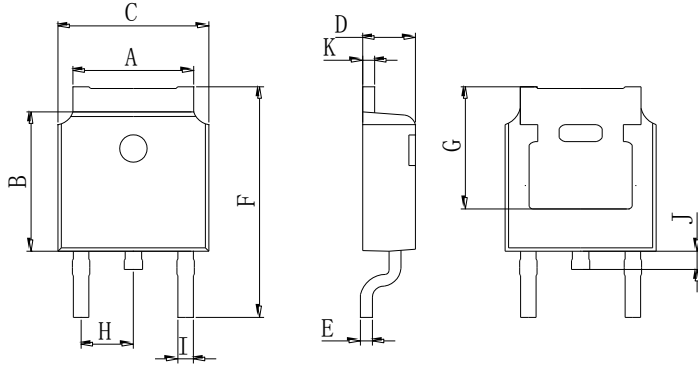


Fig.8 Safe Operating Area

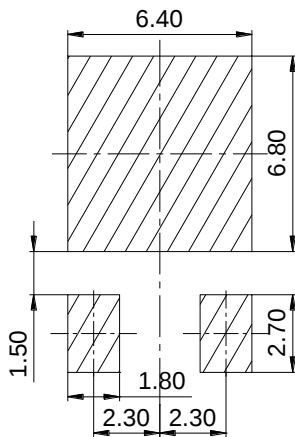
Package Outline Dimensions (Unit: mm)



TO-252		
Dimension	Min.	Max.
A	5.05	5.65
B	5.80	6.40
C	6.25	6.85
D	2.20	2.40
E	0.40	0.60
F	9.71	10.31
G	5.05	5.65
H	2.10	2.50
I	0.70	0.90
J	0.50	0.70
K	0.40	0.60

Mounting Pad Layout (Unit: mm)

TO-252



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