

Features

- Fast switching
- Low gate charge and $R_{DS(ON)}$
- Low reverse transfer capacitance
- Halogen free
- Qualified to AEC-Q101 standards for high reliability

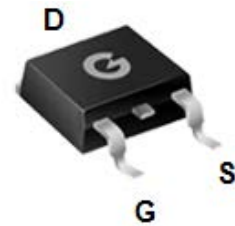
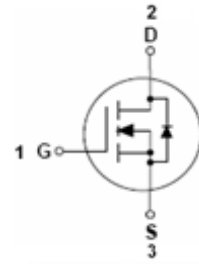
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Typical Applications

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

Mechanical Data

- Case: TO-252
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matted-Tin plated; Solderable Per MIL-STD-202, Method 208



TO-252

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
TBL300N10D	TO-252	80 pcs / Tube or 2500 pcs / Tape & Reel	300N10

Maximum Ratings (@ $T_C = 25^\circ\text{C}$ 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 ($T_C = 25^\circ\text{C}$)	I_D	30	A
Continuous Drain Current ($T_C = 100^\circ\text{C}$)		21	A
Pulsed Drain Current	I_{DM}	120	A
Single Pulse Avalanche Energy ^{*1}	E_{AS}	30	mJ

Thermal Characteristics

Parameter	Symbol	Value	Unit
Power Dissipation ($T_C = 25^\circ\text{C}$)	P_D	42	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	3	$^\circ\text{C/W}$
Operating Junction Temperature Range	T_J	$-55 \sim +150$	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	$-55 \sim +150$	$^\circ\text{C}$

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 _A = 25°C	-	-	1	μA
		V _{DS} = 80V, V _{GS} = 0V, T _A = 125°C	-	-	250	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} = ±20V, V _{DS} = 0V	-	-	±1	μA
On Characteristics *2						
R _{DS(ON)}	Static Drain-Source On-resistance	V _{GS} = 10V, I _D = 10A	-	23	30	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	1	1.5	3	V
Dynamic Characteristics *3						
C _{ISS}	Input Capacitance	V _{GS} = 0V	-	3214	-	pF
C _{OSS}	Output Capacitance	V _{DS} = 50V	-	103	-	
C _{RSS}	Reverse Transfer Capacitance	f = 1.0MHz	-	107	-	
Switching Characteristics *3						
t _{d(ON)}	Turn-on Delay Time	V _{DD} = 50V	-	10	-	ns
t _r	Turn-on Rise Time	V _{GS} = 10V	-	10	-	
t _{d(OFF)}	Turn-Off Delay Time	R _G = 3Ω	-	38	-	
t _f	Turn-Off Fall Time	I _D = 15A	-	14	-	
Q _G	Total Gate-Charge	V _{DD} = 50V	-	74	-	nC
Q _{GS}	Gate to Source Charge	I _D = 15A	-	8.3	-	
Q _{GD}	Gate to Drain (Miller) Charge	V _{GS} = 10V	-	18	-	
Source-Drain Diode Characteristics						
V _{SD}	Diode Forward Voltage	I _{SD} = 30A, V _{GS} = 0V	-	-	1.5	V
I _S	Diode Continuous Forward Current	T _C = 25°C	-	-	30	A

Notes:

1. E_{AS} condition: $T_J = 25^\circ\text{C}$, $V_{DD} = 40V$, $V_G = 10V$, $L = 0.5\text{mH}$, $R_G = 25\Omega$
2. Pulse test: pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
3. Guaranteed by design, not subject to production

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

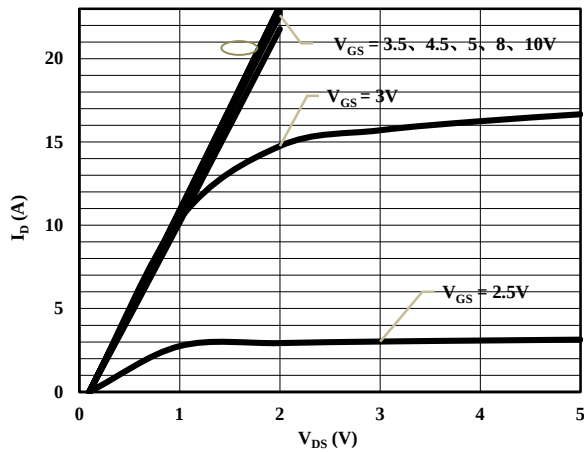


Fig 1 On-Region Characteristics

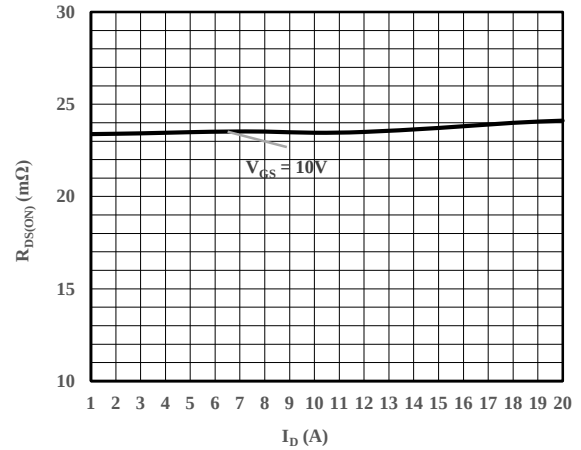


Fig 2 On-Resistance vs. Drain Current and Gate Voltage

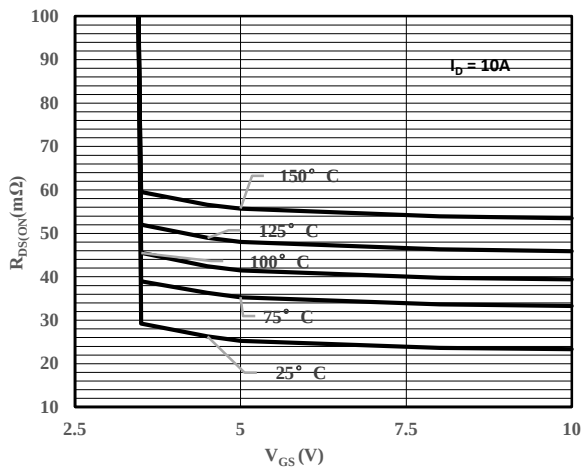


Fig 3 On-Resistance vs. Gate-Source Voltage

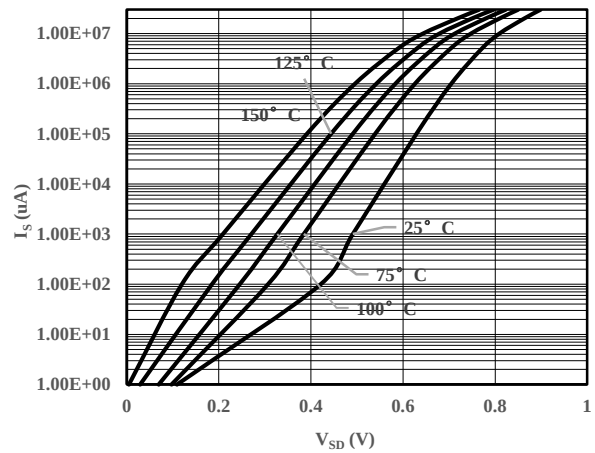


Fig 4 Body-Diode Characteristics

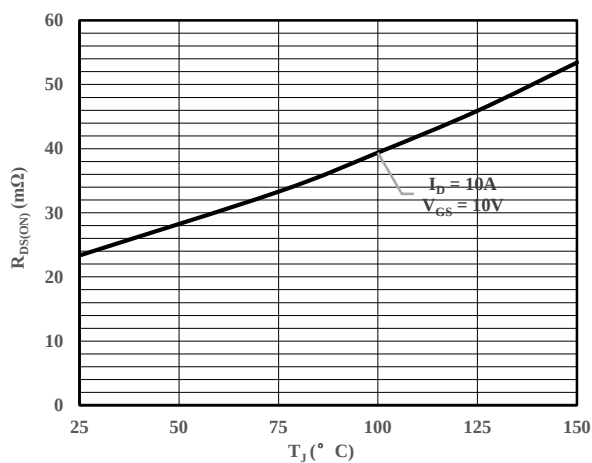


Fig 5 On-Resistance vs. Junction Temperature

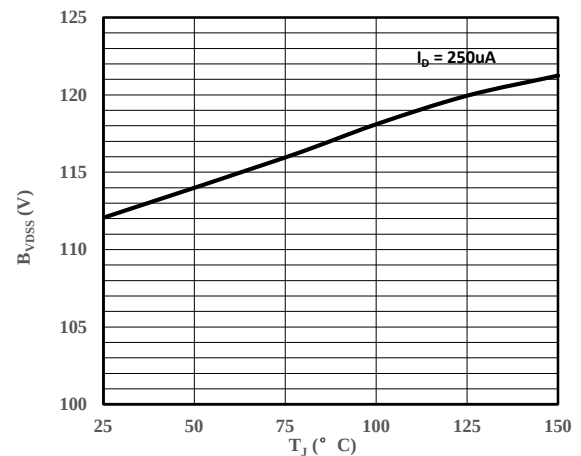


Fig 6 Drain-Source vs. Junction Temperature

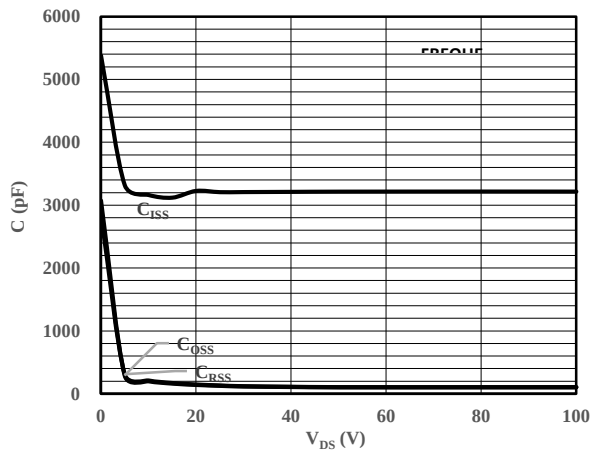


Fig 7 Capacitance Characteristics

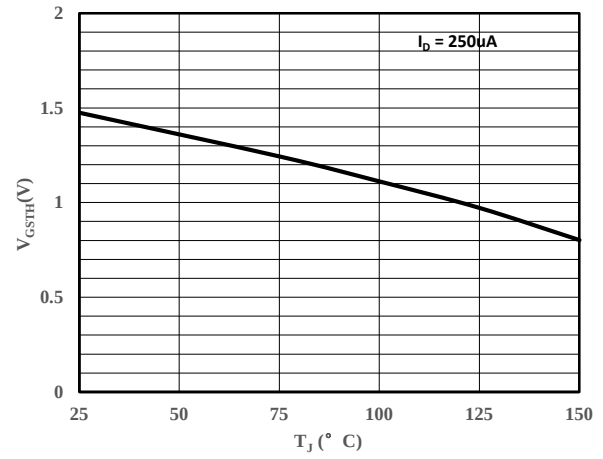
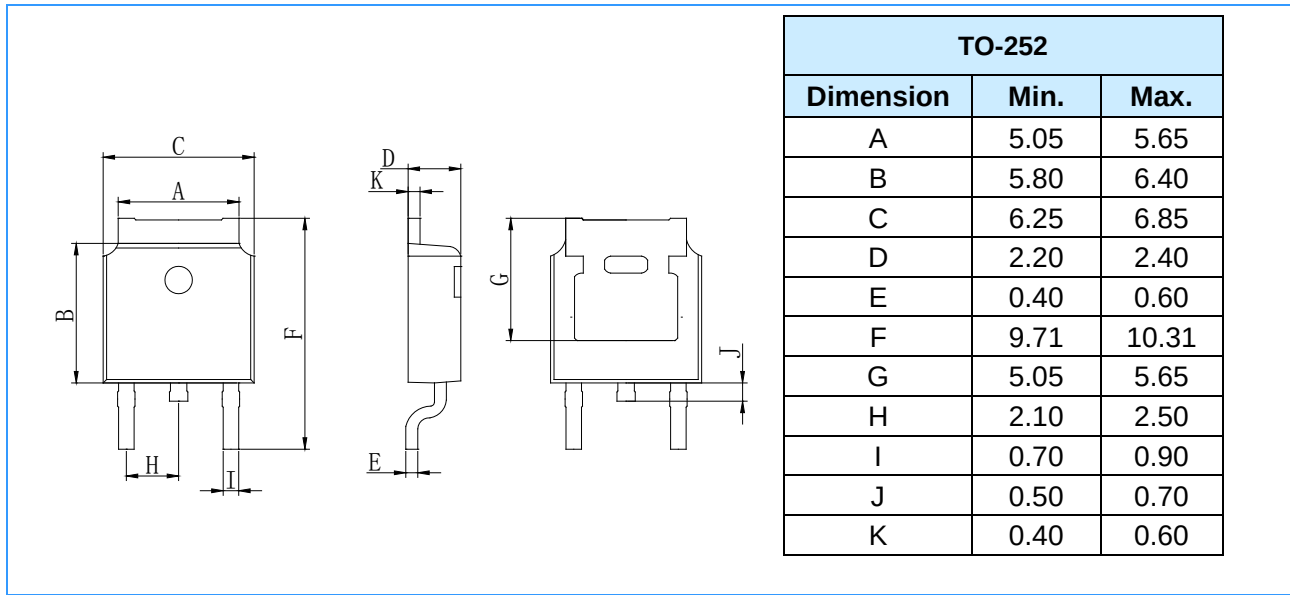
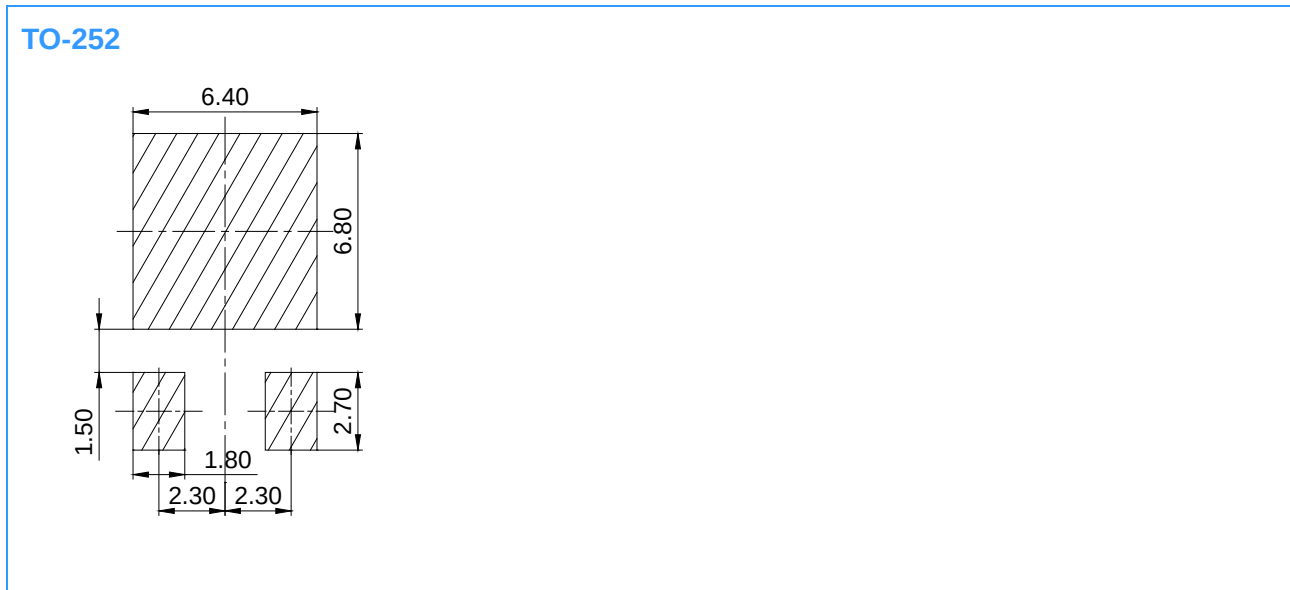


Fig 8 Gate Voltage vs. Junction Temperature

Package Outline Dimensions (Unit: mm)



Mounting Pad Layout (Unit: mm)



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