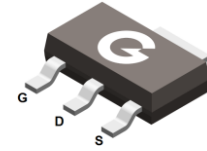
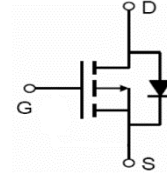


Features

- Advanced trench cell design
- Extremely low threshold voltage
- RoHS compliant with Halogen-free
- Qualified to AEC-Q101 standards for high reliability

HF



SOT-223

Mechanical Data

- Case: SOT-223
- 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
TBL500P04R	SOT-223	4000 pcs / Tape & Reel	500P04R

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

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V_{DS}	-40	V
Gate-to-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_A = 25^\circ\text{C}$)	I_D	-6	A
Pulsed Drain Current ^{*3}	I_{DM}	-24	A

Thermal Characteristics

Parameter	Symbol	Value	Unit
Power Dissipation ($T_A = 25^\circ\text{C}$)	P_D	2	W
Thermal Resistance Junction-to-Air ^{*1}	$R_{\theta JA}$	62.5	$^\circ\text{C/W}$
Operating Junction Temperature Range	T_J	-55 ~ +150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 ~ +150	$^\circ\text{C}$

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

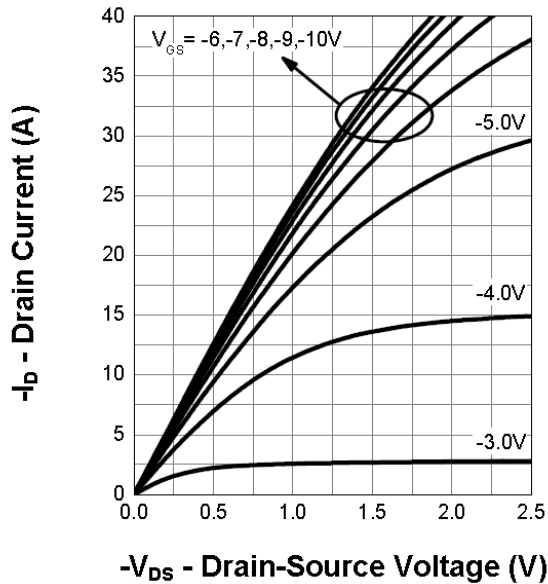
Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
V _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = -250μA	-40	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = -32V, V _{GS} = 0V	-	-	-1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} = ±20V, V _{DS} = 0V	-	-	±100	nA
On Characteristics						
R _{DS(ON)}	Static Drain-Source On-resistance *3	V _{GS} = -10V, I _D = -3A	-	-	50	mΩ
		V _{GS} = -4.5V, I _D = -2A	-	-	75	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = -250μA	-1.3	-	-2.5	V
Dynamic Characteristics *4						
C _{ISS}	Input Capacitance	V _{GS} = 0V V _{DS} = -15V f = 1.0MHz	-	1150	-	pF
C _{OSS}	Output Capacitance		-	100	-	
C _{RSS}	Reverse Transfer Capacitance		-	77	-	
Switching Characteristics *4						
t _{d(ON)}	Turn-on Delay Time	V _{GS} = -10V V _{DD} = -20V I _D = -3A R _G = 3.3Ω	-	6.8	-	ns
t _r	Turn-on Rise Time		-	33	-	
t _{d(OFF)}	Turn-Off Delay Time		-	30	-	
t _f	Turn-Off Fall Time		-	12	-	
Q _G	Total Gate-Charge	V _{GS} = -10V V _{DD} = -32V I _D = -3A	-	20	-	nC
Q _{GS}	Gate to Source Charge		-	5.7	-	
Q _{GD}	Gate to Drain (Miller) Charge		-	4.6	-	
Source-Drain Diode Characteristics						
V _{SD}	Diode Forward Voltage *3	I _{SD} = -1A, V _{GS} = 0V	-	-	-1.3	V
I _{SD}	Source-Drain Current(Body Diode)	T _C = 25°C	-	-	-20	A
trr	Reverse Recovery Time	I _{SD} = - 3 A, dI _{SD} / dt = 100 A / μs	-	6.1	-	ns
Qrr	Reverse Recovery Charge		-	1.6	-	nC

Notes:

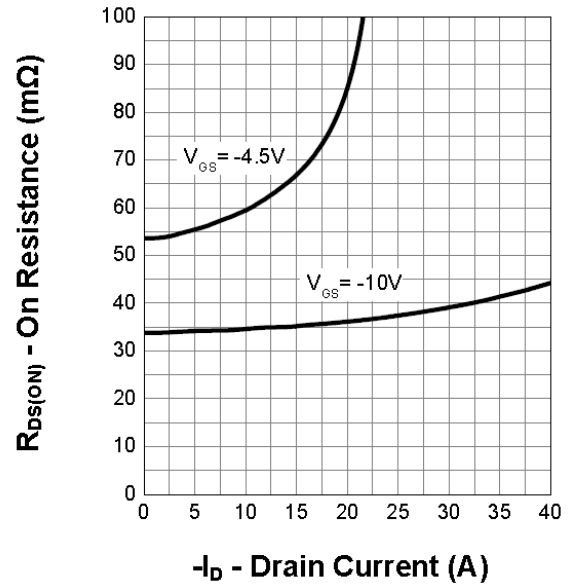
1. Mounted on PCB of 1 in² pad area
2. Mounted on Large Heat Sink
3. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
4. Guaranteed by design, not subject to production testing

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

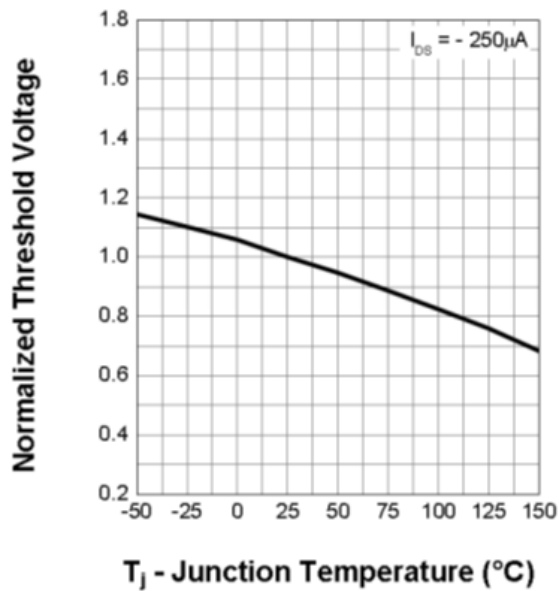
Output Characteristics



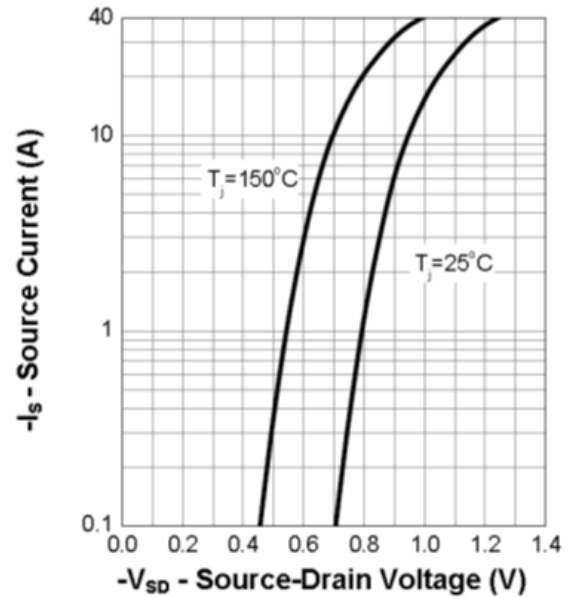
Drain-Source On Resistance



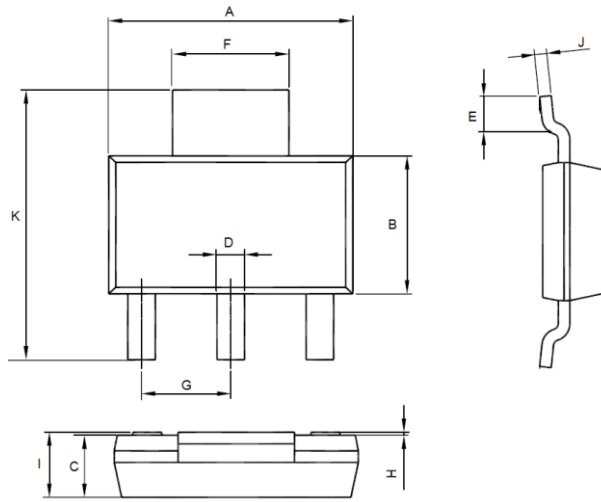
Normalized Threshold Voltage



Diode Forward Current



Package Outline Dimensions (Unit: mm)



SOT-223		
Dimension	Min.	Max.
A	6.10	6.50
B	3.30	3.70
C	1.50	1.70
D	0.66	0.82
E	0.90	1.15
F	2.90	3.10
G	2.20	2.40
H	0.02	0.10
I	1.52	1.80
J	0.20	0.40
K	6.70	7.30

Mounting Pad Layout (Unit: mm)

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