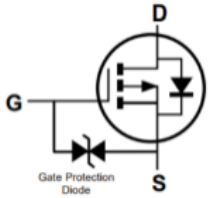
P-Channel Enhancement Mode MOSFET

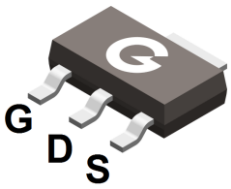
TBL0K6P10R

Features

- Low on resistance
- Low gate charge
- Fast switching characteristic
- ESD protected gate up to 2kV HBM
- 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
TBL0K6P10R	SOT-223	4000 pcs / Tape & Reel	0K6P10

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 (V_{GS} = -10V, T_A = 25°C) *1	I_D	-1.28	A
Continuous Drain Current (V_{GS} = -10V, T_A = 70°C) *1		-1	A
Pulsed Drain Current *2	I_{DM}	-5	A

Thermal Characteristics

Parameter	Symbol	Value	Unit
Power Dissipation (T_A = 25°C) *1	P_D	1.78	W
Power Dissipation (T_A = 70°C) *1		1.14	W
Thermal Resistance Junction-to-Air *1	$R_{\theta JA}$	70	°C/W
Operating Junction Temperature Range	T_J	-55 ~ +150	°C
Storage Temperature Range	T_{STG}	-55 ~ +150	°C

Electrical Characteristics (@ T_A = 25°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} = -80V, V_{GS} = 0V	-	-	-1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS} = ±16V, V_{DS} = 0V	-	-	±10	μA
On Characteristics						
$R_{DS(ON)}$	Static Drain-Source On-resistance	V_{GS} = -10V,I_D = -0.9A	-	-	0.6	Ω
		V_{GS} = -4.5V,I_D = -0.5A	-	-	0.73	Ω
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = -250μA	-1	-	-2.5	V
g_{FS}	Forward Transconductance	V_{DS} = -10V, I_D = -1A	-	2.5	-	S
Dynamic Characteristics						
R_G	Gate Resistance	V_{GS} = 0V, f = 1MHz	-	5.4	-	Ω
C_{ISS}	Input Capacitance	V_{GS} = 0V V_{DS} = -50V f = 1.0MHz	-	270	-	pF
C_{OSS}	Output Capacitance		-	20	-	
C_{RSS}	Reverse Transfer Capacitance		-	21	-	
Switching Characteristics *3, 4						
$t_{d(ON)}$	Turn-on Delay Time	V_{DD} = -50V V_{GS} = -10V R_G = 6Ω I_D = -1A	-	8.2	-	ns
t_r	Turn-on Rise Time		-	1.2	-	
$t_{d(OFF)}$	Turn-Off Delay Time		-	21	-	
t_f	Turn-Off Fall Time		-	1.8	-	
Q_G	Total Gate-Charge	V_{DD} = -50V V_{GS} = -10V I_D = -1A	-	6.6	-	nC
Q_{GS}	Gate to Source Charge		-	1	-	
Q_{GD}	Gate to Drain (Miller) Charge		-	1.5	-	
Source-Drain Diode Characteristics						
V_{SD}	Diode Forward Voltage *3	I_{SD} = -1A, V_{GS} = 0V	-	-	-1.2	V
I_S	Continuous Body Diode Forward Current *1	T_A = 25°C	-	-	-0.7	A
trr	Reverse Recovery Time	I_F = -1A di/d_t = 100A/μs	-	17	-	ns
Qrr	Reverse Recovery Charge		-	12	-	nC

Notes:

1. The value of $R_{\theta JA}$ is measured with the device mounted on 1 in² FR-4 board with 2 oz. copper, in a still air environment with T_A = 25°C. The value in any given application depends on the user's specific board design
2. Repetitive rating, pulse width limited by junction temperature TJ(MAX)=150°C. Ratings are based on low frequency and low duty cycles to keep initial T_J = 25°C. tp=10us.
3. The data tested by pulsed, pulse width ≤ 300μs, duty cycle ≤ 2%
4. Independent of operating temperature

Ratings and Characteristics Curves (@ T_A = 25°C unless otherwise specified)

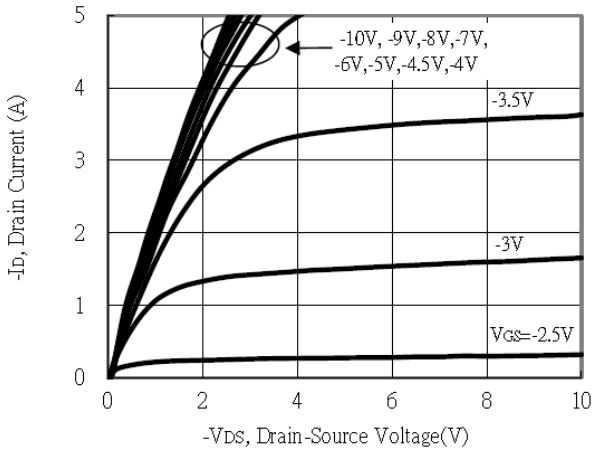


Fig 1 Typical Output Characteristics

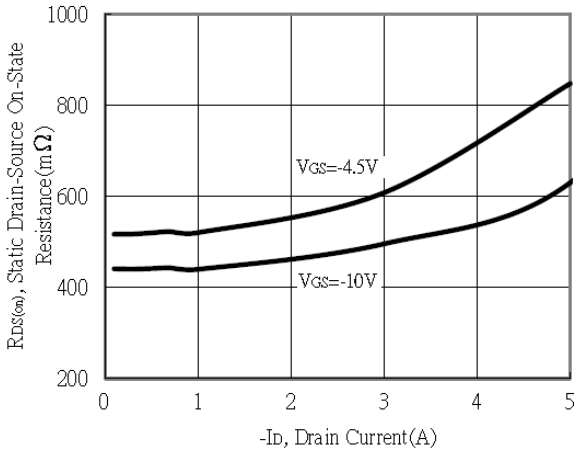


Fig 2 On-Resistance vs. Drain Current and Gate Voltage

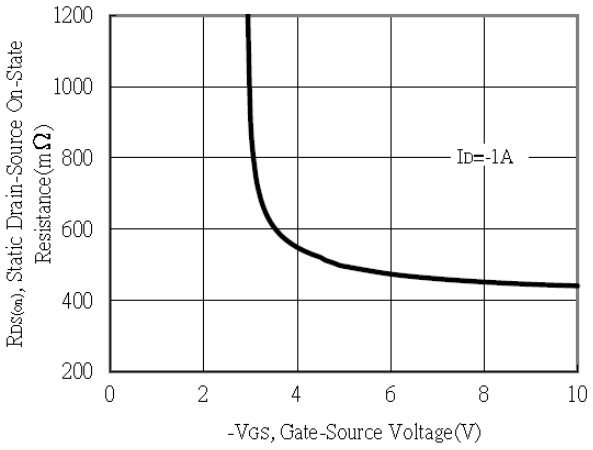


Fig 3 On-Resistance vs. Gate-Source Voltage

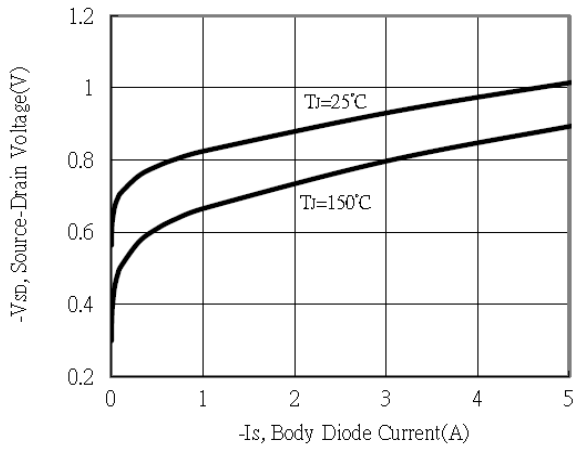


Fig 4 Body-Diode Characteristics

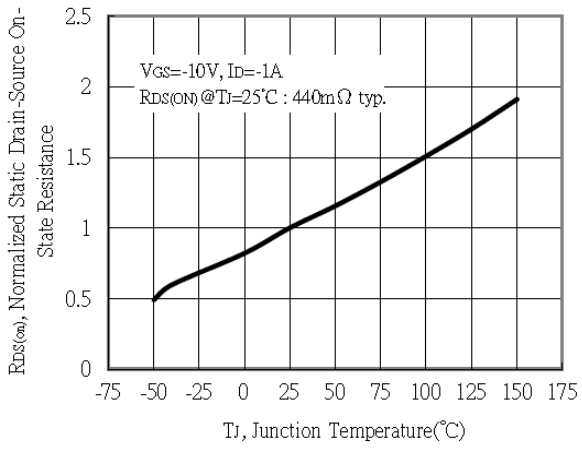


Fig 5 On-Resistance vs. Junction Temperature

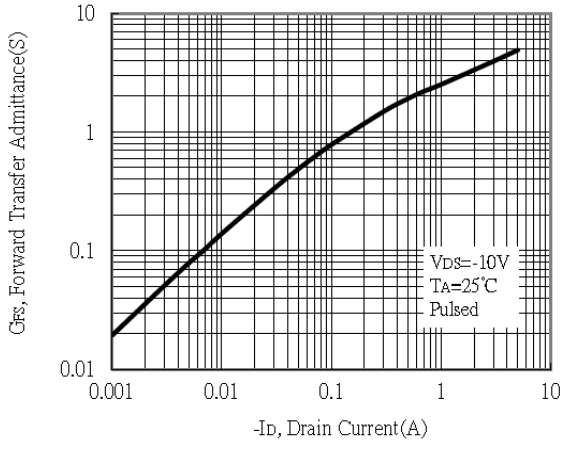


Fig 6 Forward Transfer Admittance vs Drain Current

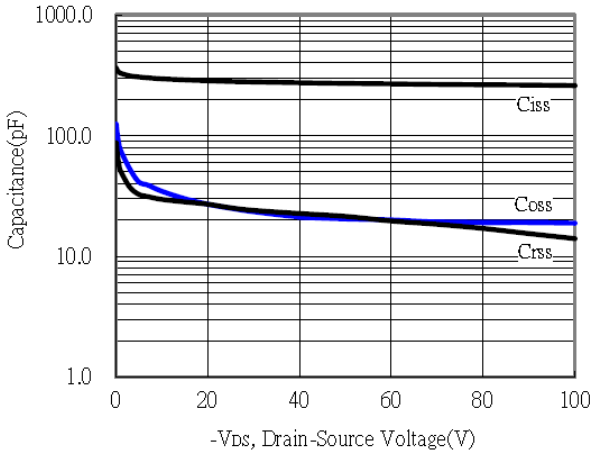


Fig 7 Capacitance Characteristics

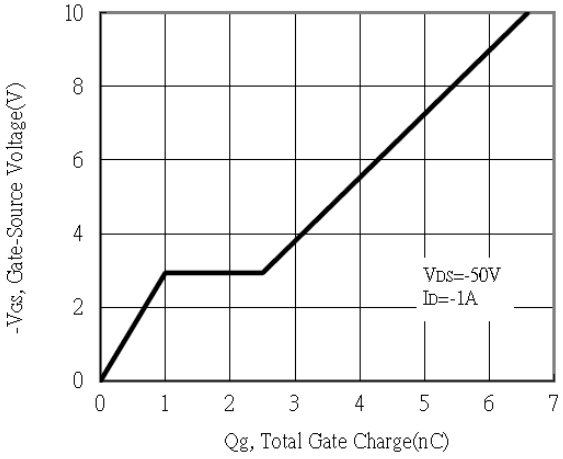


Fig 8 Gate-Charge Characteristics

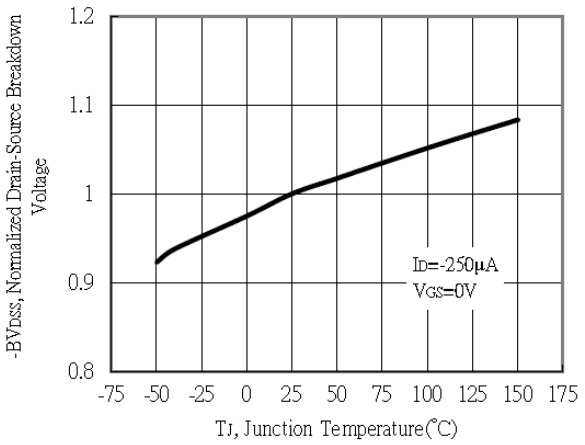


Fig 9 Breakdown Voltage vs. Junction Temperature

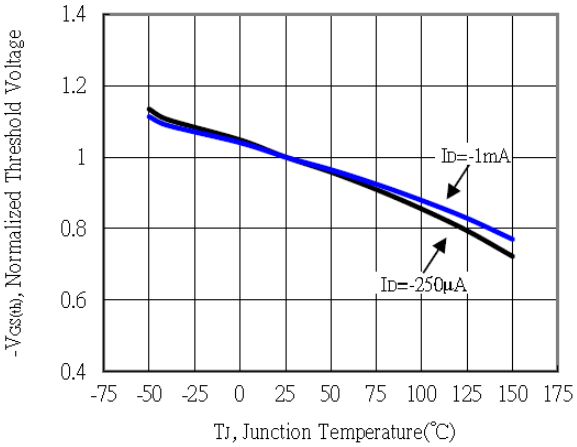


Fig 10 $V_{GS(th)}$ vs. Junction Temperature

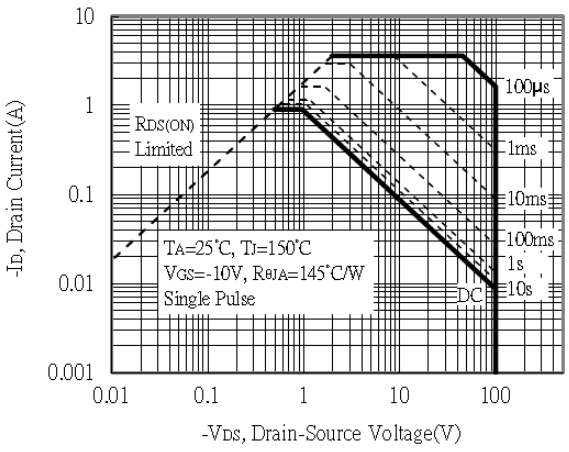


Fig 11 Safe Operation Area

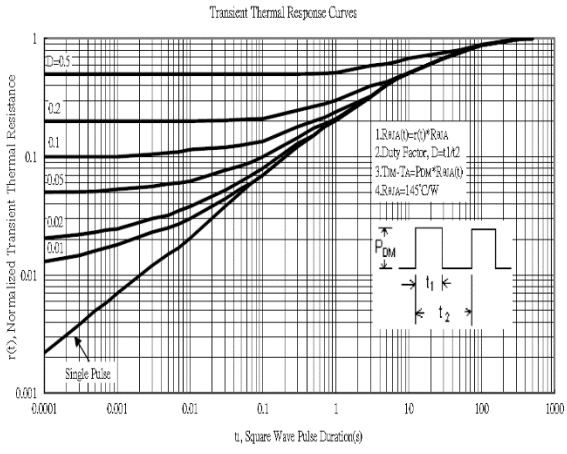
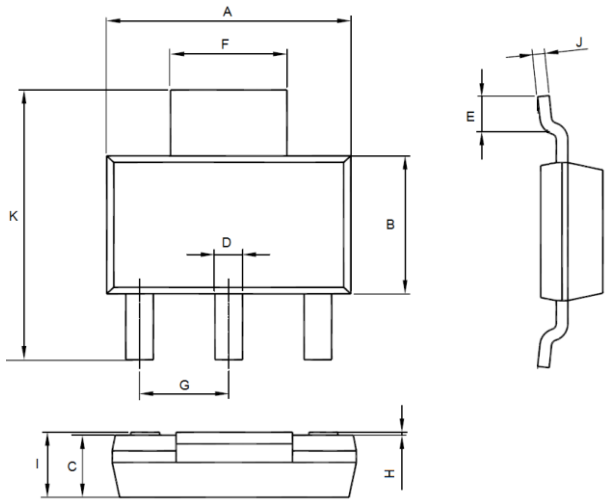


Fig 12 Transient Thermal Response Curves

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)

SOT-223

