P-Channel Enhancement Mode MOSFET

TBL0K6P10 TBL0K6P10-3L

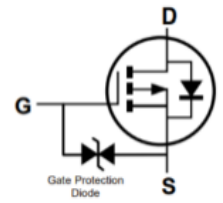
Features

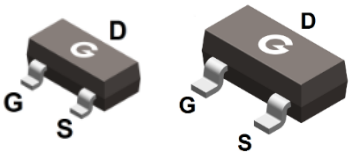
- Low on resistance
- Low gate charge
- Fast switching speed
- HBM: AEC-Q101-001: H2 (JESD22-A114-B: 2)
- RoHS compliant with Halogen-free
- Qualified to AEC-Q101 Standards

HF

Mechanical Data

- Case: SOT-23, SOT-23-3L
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208





SOT-23 SOT-23-3L

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
TBL0K6P10	SOT-23	3000 pcs / Tape & Reel	0K6P10
TBL0K6P10-3L	SOT-23-3L	3000 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 (T_A = 25°C) *1	I_D	-1.1	A
Continuous Drain Current (T_A = 25°C) *2		-0.9	
Continuous Drain Current (T_A = 70°C) *2		-0.7	
Pulsed Drain Current (t_p =10μs, T_A = 25°C)	I_{DM}	-3.6	A
Power Dissipation (T_A = 25°C) *1	P_D	1.5	W
Power Dissipation (T_A = 25°C) *2		0.9	
Operating Junction Temperature Range	T_J	-55 ~ +150	°C
Storage Temperature Range	T_{STG}	-55 ~ +150	°C

Thermal Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	-	40	45	°C/W
Thermal Resistance Junction-to-Air *1	$R_{\theta JA}$	-	70	83	°C/W
Thermal Resistance Junction-to-Air *2		-	110	140	

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						
$R_{DS(ON)}$	Drain-Source On-resistance *3	V_{GS} = -10V,I_D = -0.9A	-	-	0.6	Ω
		V_{GS} = -4.5V,I_D = -0.5A	-	-	0.7	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = -250μA	-1	-	-2.5	V
R_G	Gate Resistance	V_{GS} = 0V, f = 1MHz	-	5.4	-	Ω
Dynamic Characteristics						
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						
$t_{d(ON)}$	Turn-on Delay Time *4	V_{DD} = -50V V_{GS} = -10V R_G = 6Ω I_D = -1A	-	8.2	-	ns
t_r	Turn-on Rise Time *4		-	1.2	-	
$t_{d(OFF)}$	Turn-Off Delay Time *4		-	21	-	
t_f	Turn-Off Fall Time *4		-	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
trr	Reverse Recovery Time	I_F = -1A, V_{GS} = 0V di/d_t = 100A/μs	-	17	-	ns
Qrr	Reverse Recovery Charge		-	12	-	nC

Notes:

1. The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper，t<1s
2. The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper，steady state
3. The data tested by pulsed, pulse width ≤ 300μs, duty cycle ≤ 2%
4. Guaranteed by design, not subject to production

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

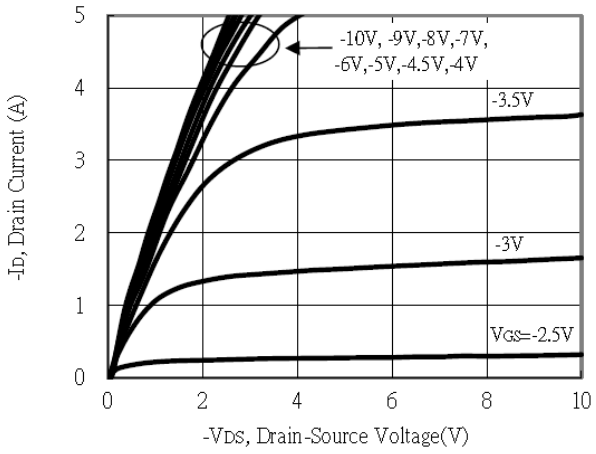


Fig 1 Typical Output Characteristics

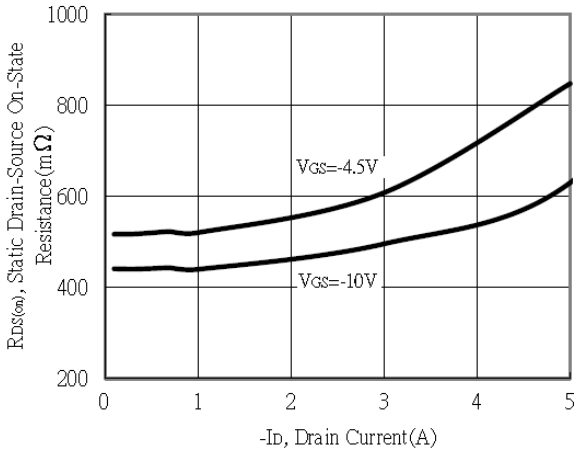


Fig 2 On-Resistance vs. Drain Current and Gate Voltage

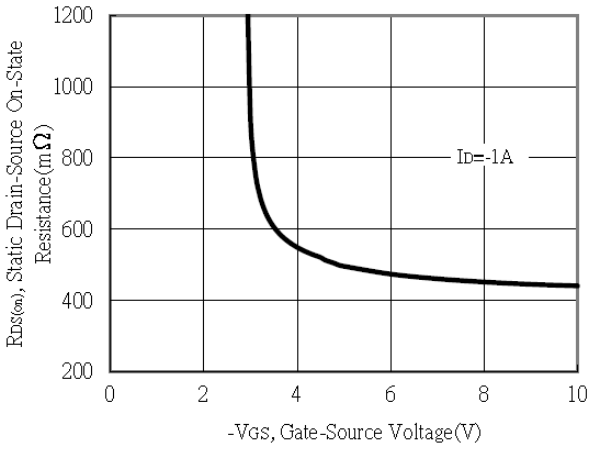


Fig 3 On-Resistance vs. Gate-Source Voltage

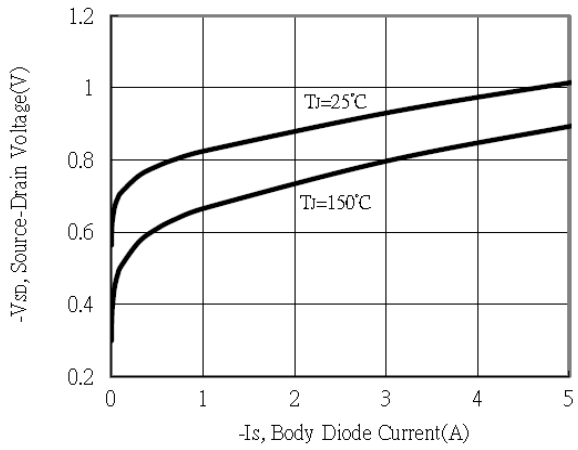


Fig 4 Body-Diode Characteristics

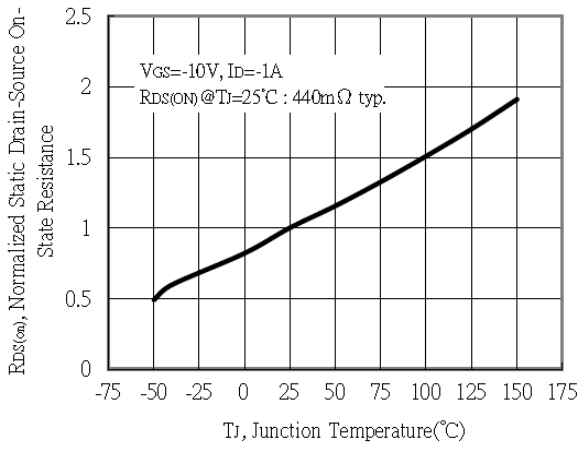


Fig 5 On-Resistance vs. Junction Temperature

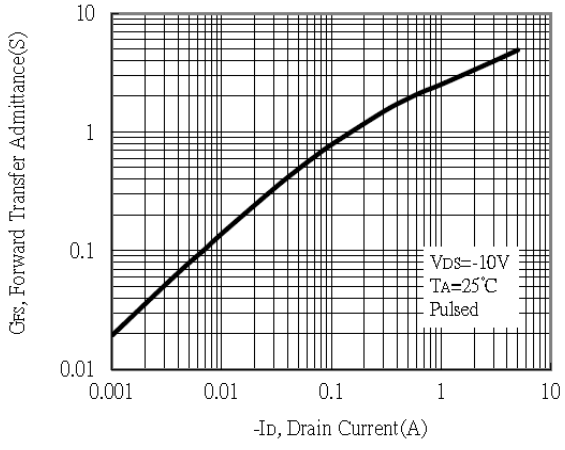


Fig 6 Forward Transfer Admittance vs Drain Current

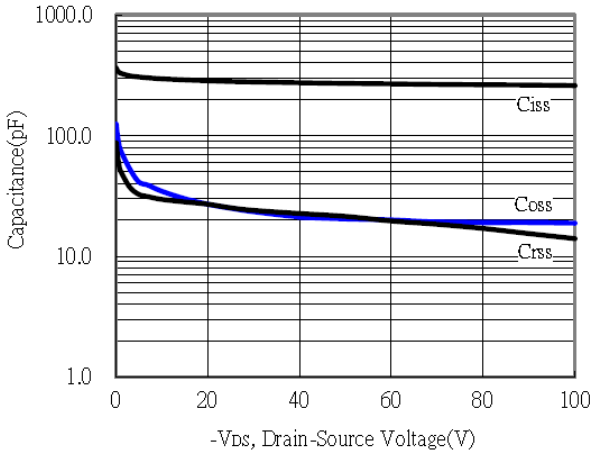


Fig 7 Capacitance Characteristics

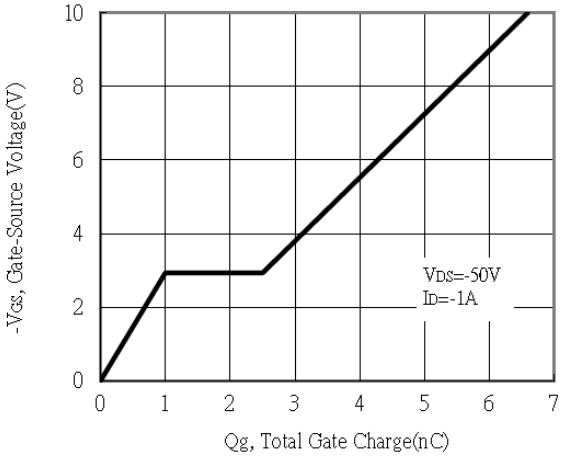


Fig 8 Gate-Charge Characteristics

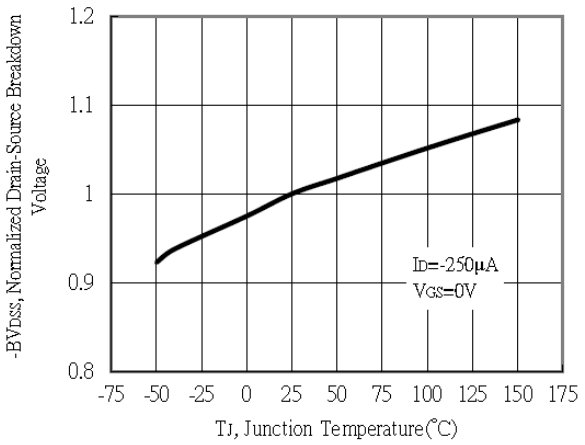


Fig 9 Breakdown Voltage vs. Junction Temperature

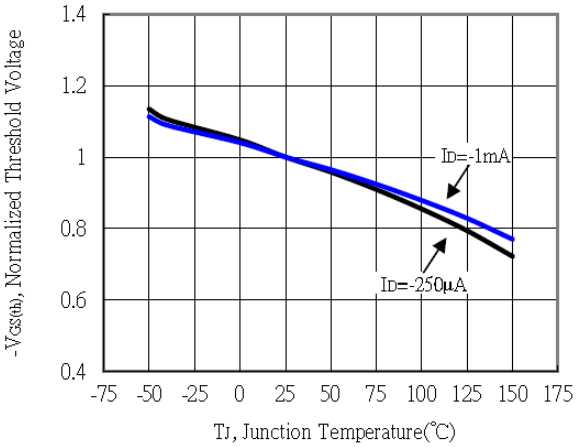


Fig 10 $V_{GS(th)}$ vs. Junction Temperature

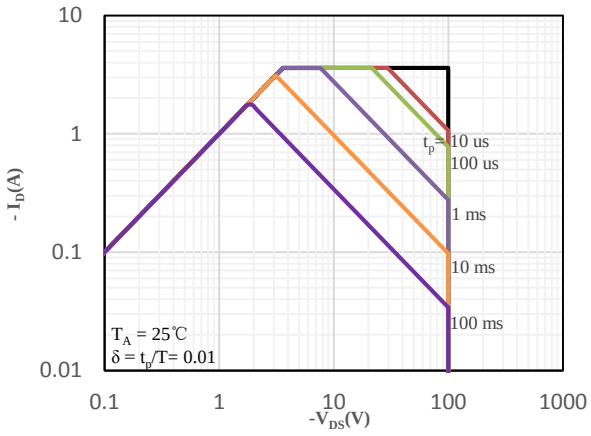


Fig 11 Safe Operation Area

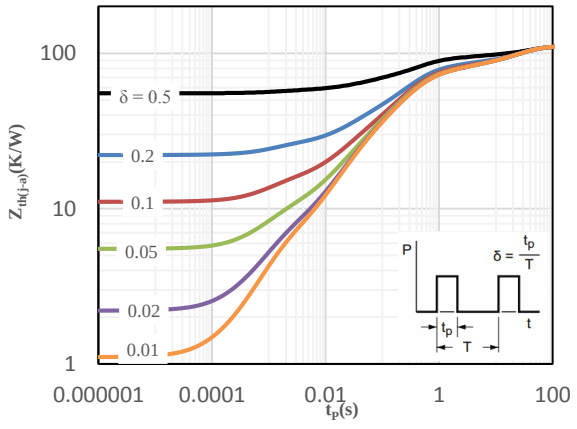
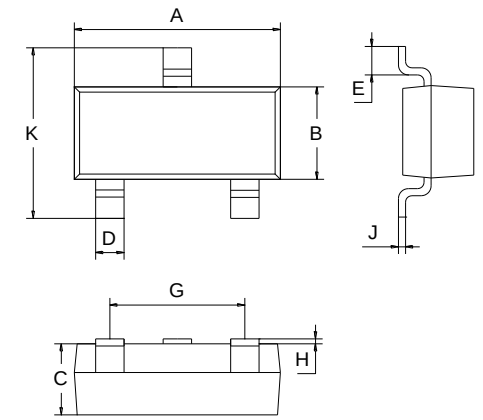
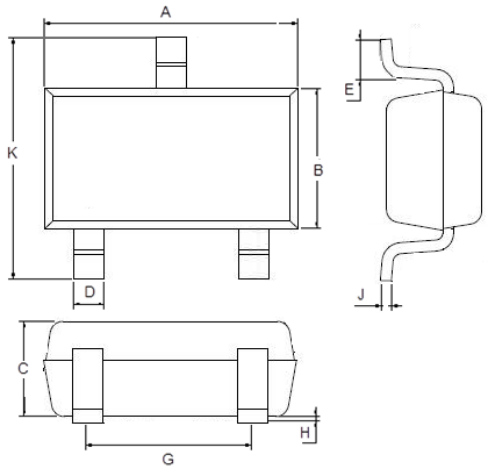


Fig 12 Maximum transient thermal impedance

Package Outline Dimensions (Unit: mm)



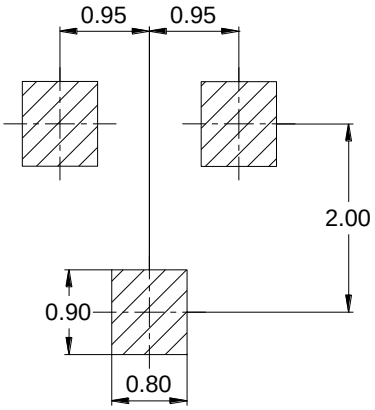
SOT-23		
Dimension	**Min.**	**Max.**
A	2.70	3.10
B	1.10	1.50
C	0.90	1.10
D	0.30	0.50
E	0.35	0.48
G	1.80	2.00
H	0.02	0.10
J	0.05	0.15
K	2.20	2.60



SOT-23-3L		
Dimension	**Min.**	**Max.**
A	2.80	3.00
B	1.50	1.70
C	1.00	1.20
D	0.35	0.45
E	0.35	0.55
G	1.80	2.00
H	0.02	0.10
J	0.10	0.20
K	2.60	3.00

Package Outline Dimensions (Unit: mm)

SOT-23



SOT-23-3L

