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TP0610K

1.7Ω ,60V P-Channel MOSFET

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Product Summary

- Vdss=60V
- ID= 0.5A
- $R_{DS(ON)}$ = 1.7Ω@V_{GS}=-10V

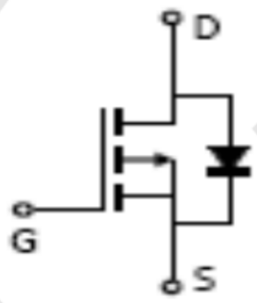
Typical Applications

- Line current interrupter in telephone sets
- High speed and line transformer drivers

Package and Pin Configuration

SOT-23

Circuit diagram



Marking:610T

Maximum Ratings (@T_A=25℃ unless otherwise specified)

Symbol	Parameter	Value	Units
V_{DSS}	Drain-Source Voltage	-60	V
V_{GSS}	Gate -Source Voltage	±20	V
I_D	Continuous Drain Current	-0.5	A
P_D	Power Dissipation	0.36	W
$R_{\Theta JA}$	Junction-to-Air	350	℃/W
T_J	Junction Temperature	150	℃
T_{STG}	Storage Temperature Range	-55 to +150	℃

Electrical Characteristics (@T_A=25℃ unless otherwise specified)

Symbol	Parameter	Test conditions	MIN	TYP	MAX	UNIT
OFF Characteristics						
V_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V,I_D=-250μA	-60	-	-	V
I_{DSS}	Drain to Source Leakage Current	V_{DS}=-50V, V_{GS}=0V	-	-	-100	nA
I_{GSS}	Gate-body Leakage	V_{GS}=±20V, V_{DS}=0V	-	-	±1	uA
ON Characteristics(NOTE2)						
$R_{DS(ON)}$	Static Drain-Source On-resistance	V_{GS}=-4.5V, I_D=-0.2A	-	-	3	Ω
		V_{GS}=-10V, I_D=-0.5A	-	1.7	2	
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}= V_{GS}, I_D=-250uA	-1	-1.8	-3	V
Dynamic Characteristics(NOTE3)						
Ciss	Input Capacitance	V_{GS} = 0V	-	50	-	pF
Coss	Output Capacitance	V_{DS} = -25V	-	15	-	
Crss	Reverse Transfer Capacitance	f = 1.0MHz	-	5	-	
Switching Characteristics(NOTE3)						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=-30V,I_D=-0.27A V_{GS}=-10V,R_G=6Ω	-	2.5	5	nS
t_r	Turn-on Rise Time		-	6.3	13	
$t_{d(off)}$	Turn-Off Delay Time		-	10	20	
t_f	Turn-Off Fall Time		-	4.8	9.6	
Q_g	Total Gate Charge	V_{DS}=-25V, I_D=-0.1A V_{GS}=-5V	-	0.9	1.3	nC
Q_{gs}	Gate-Source Charge		-	0.2	-	
Q_{gd}	Gate-Drain Charge		-	0.3	-	
Source-Drain Diode Characteristics						
V_{SD}	Diode Forward Voltage(NOTE1)	I_{SD}=-0.26A,V_{GS}=0V	-	-0.8	-1.4	V
I_S	Diode Continuous Forward Current	T_C=25℃	-	-	-0.5	A

Ratings and Characteristic Curves (T_A=25℃ unless otherwise noted)

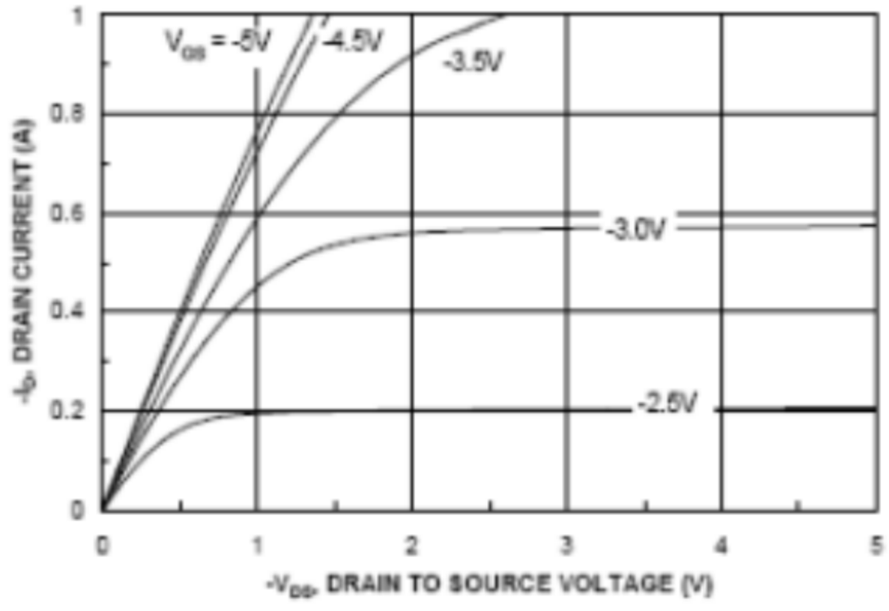


Figure 1. On-Region Characteristics.

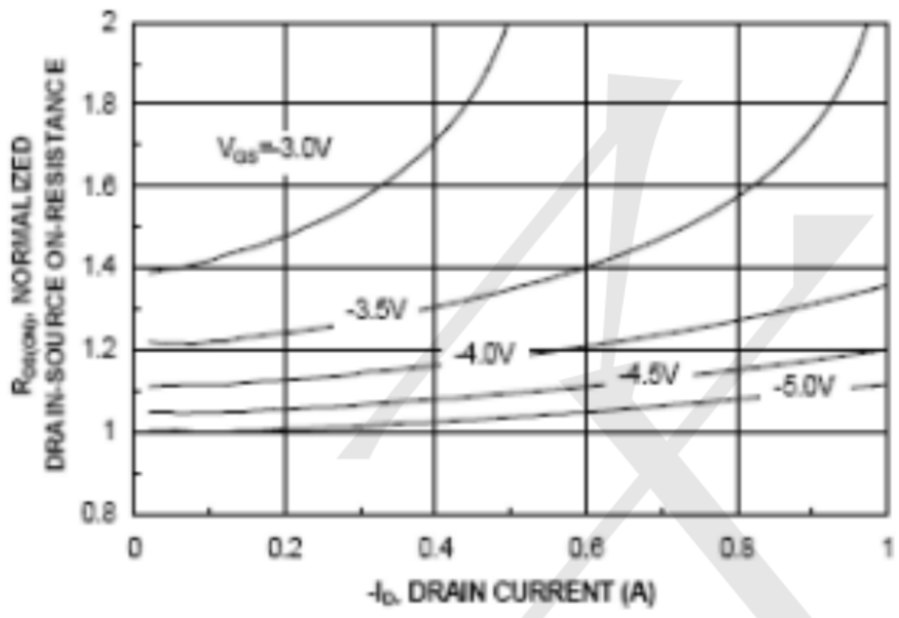


Figure 2. On-Resistance Variation with Drain Current and Gate Voltage.

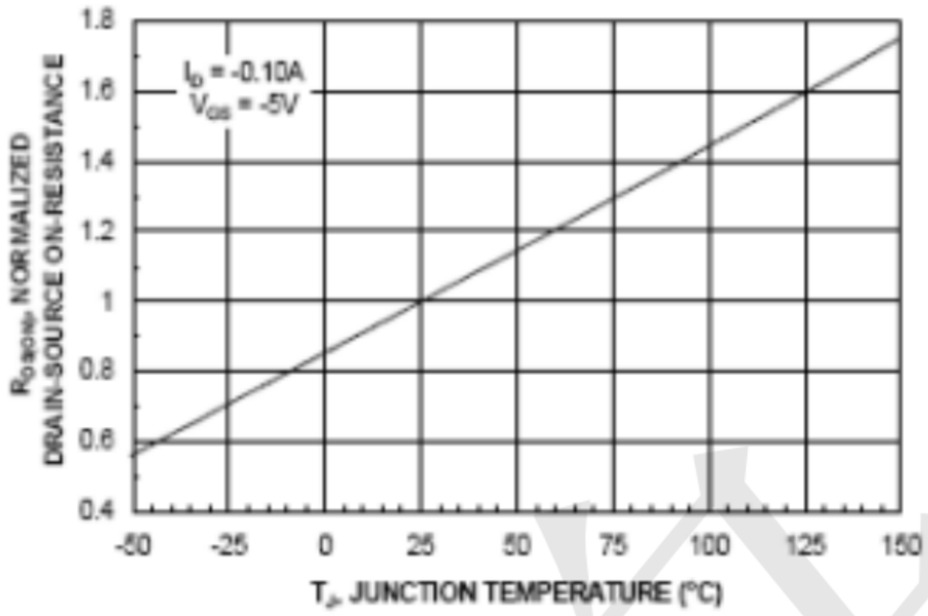


Figure 3. On-Resistance Variation with Temperature.

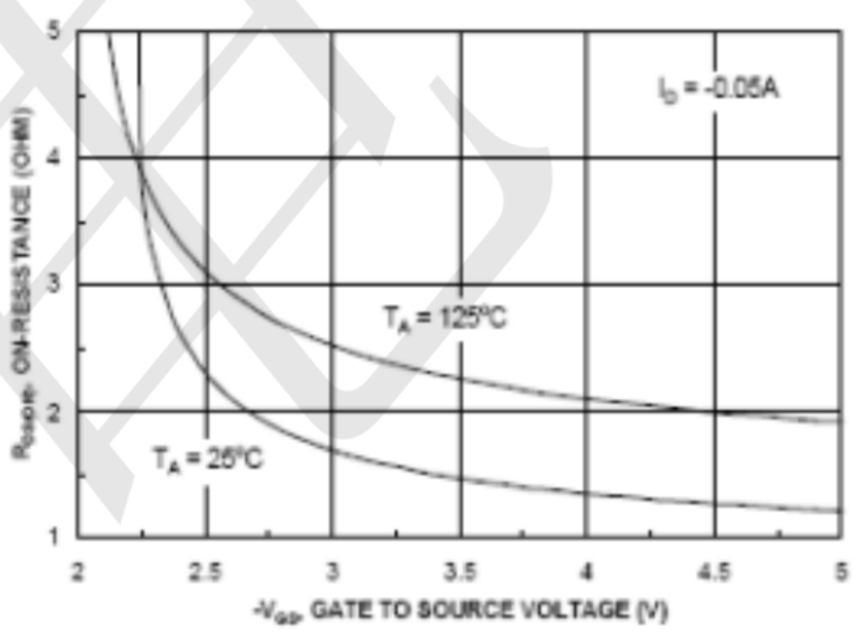


Figure 4. On-Resistance Variation with Gate-to-Source Voltage.

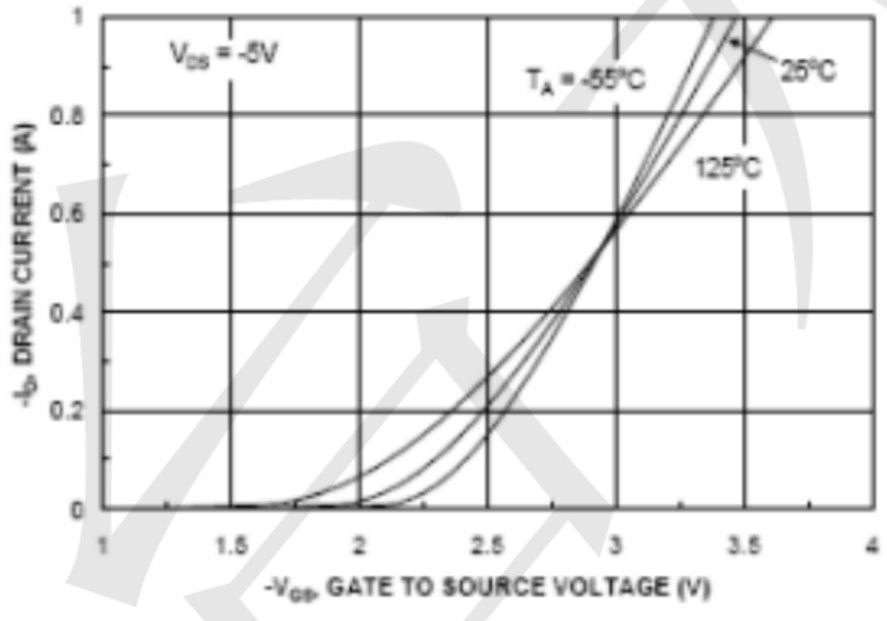


Figure 5. Transfer Characteristics.

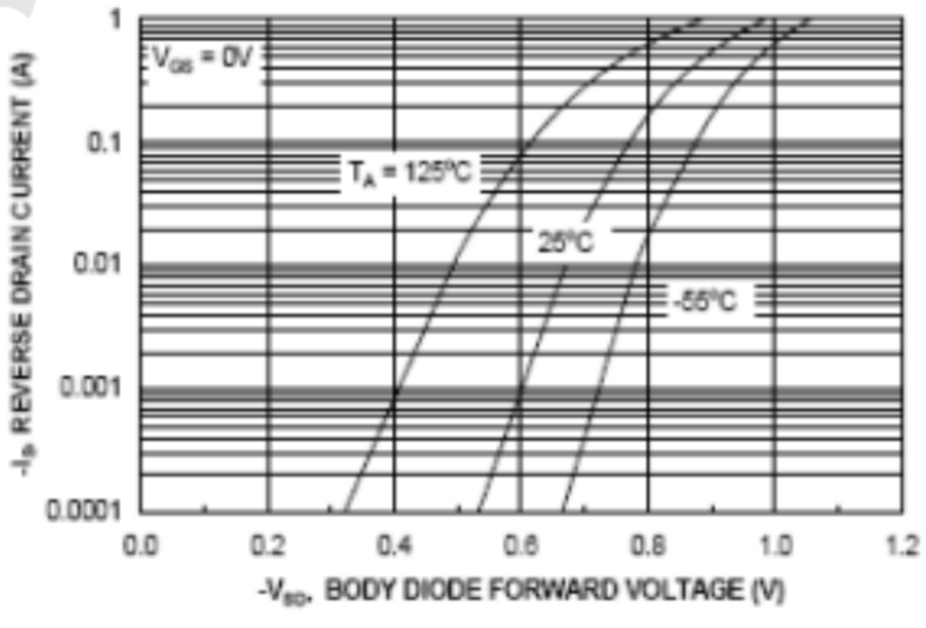


Figure 6. Body Diode Forward Voltage Variation with Source Current and Temperature.

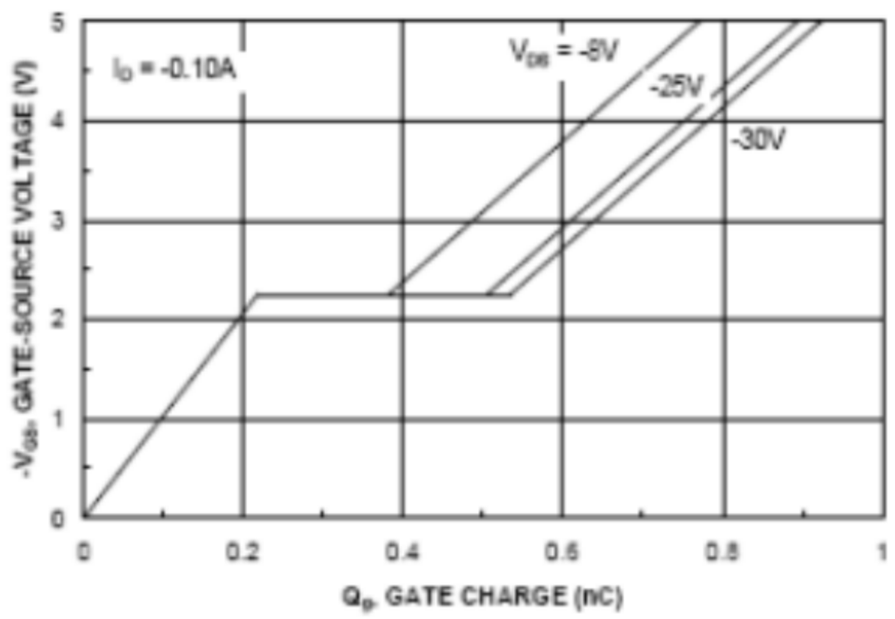


Figure 7. Gate Charge Characteristics.

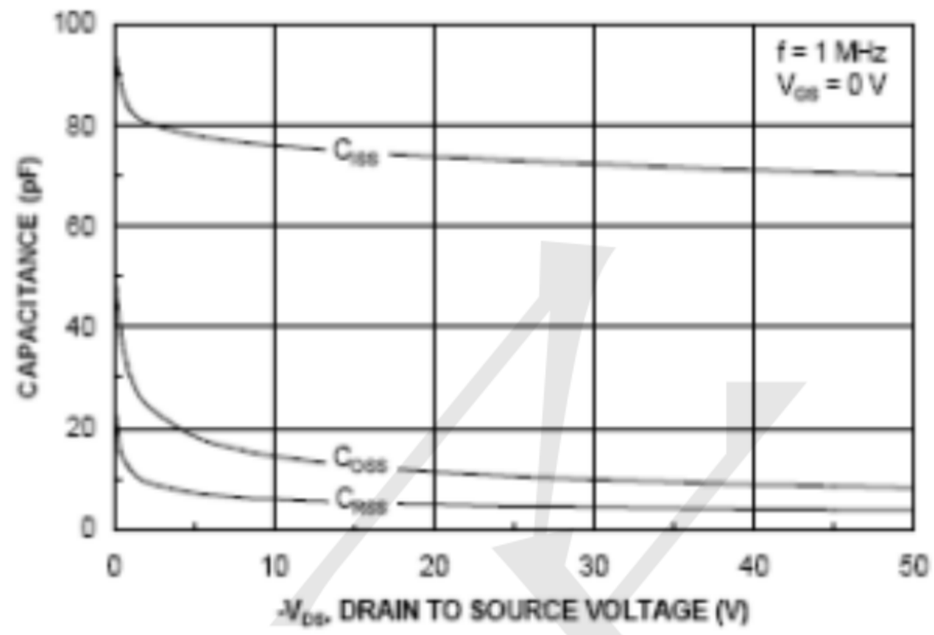


Figure 8. Capacitance Characteristics.

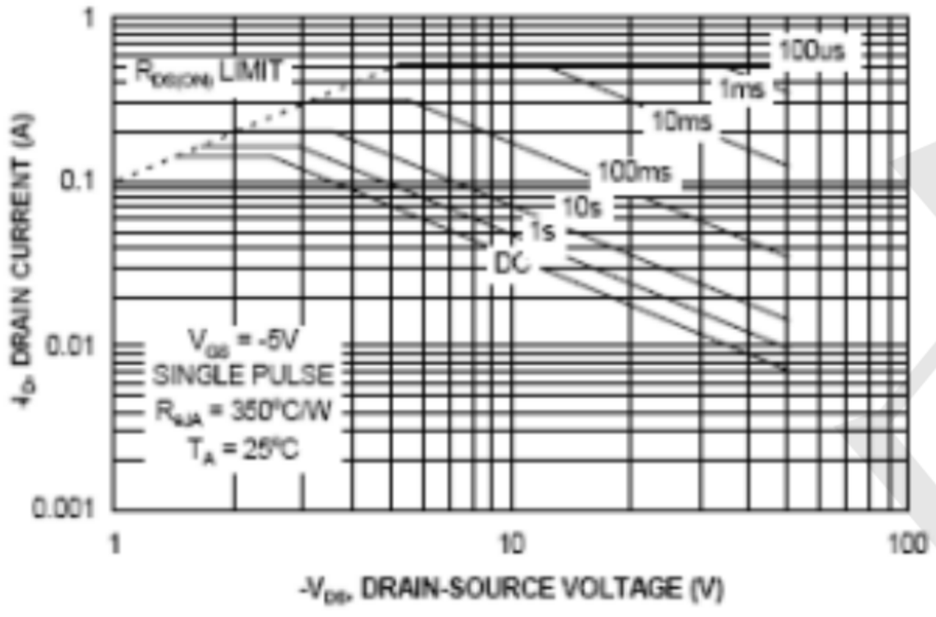


Figure 9. Maximum Safe Operating Area.

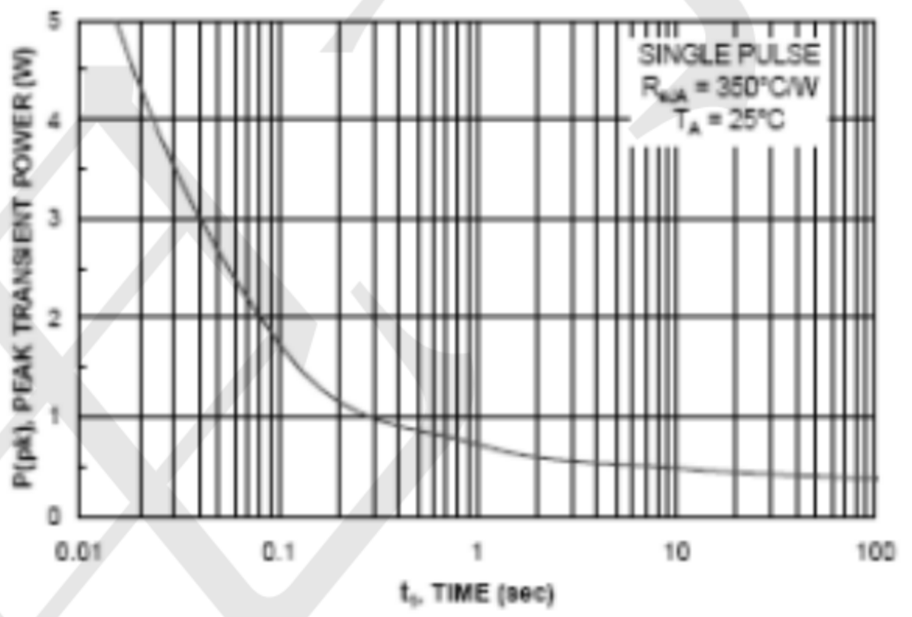


Figure 10. Single Pulse Maximum Power Dissipation.

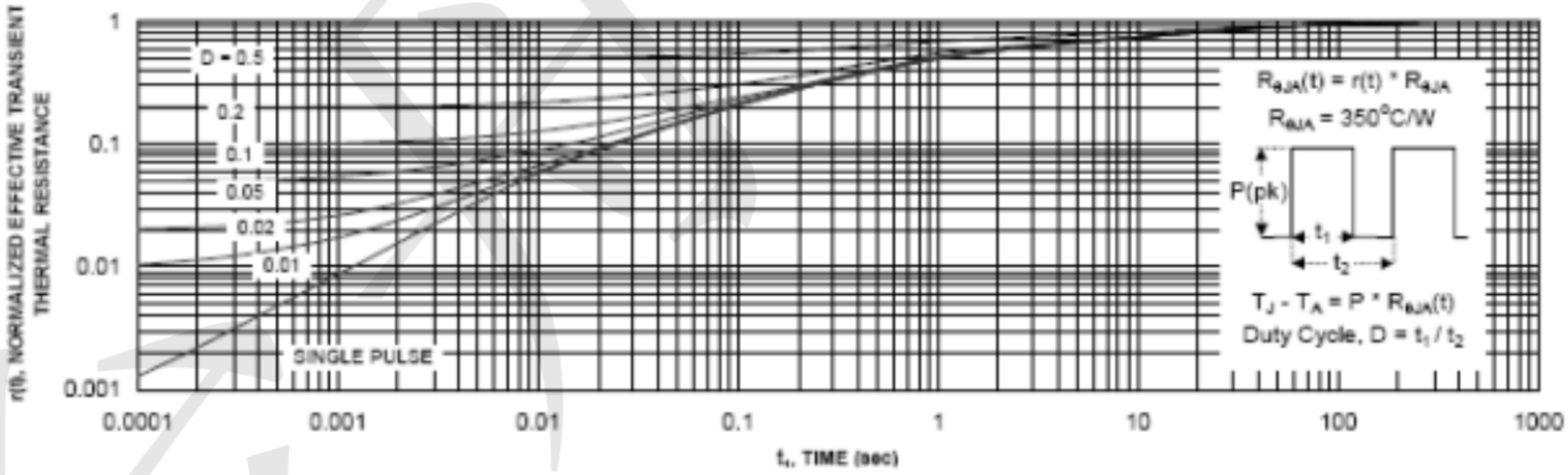
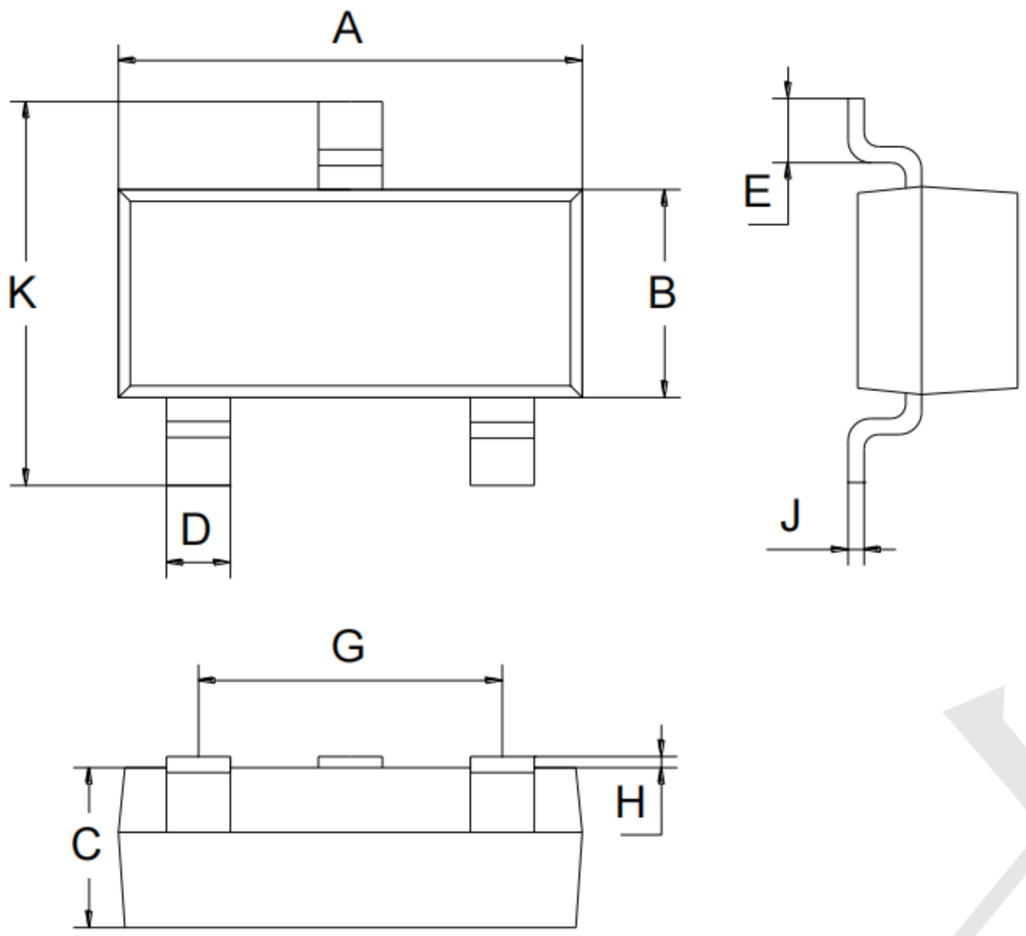


Figure 11. Transient Thermal Response Curve.

Thermal characterization performed using the conditions described in Note 1a.
Transient thermal response will change depending on the circuit board design.

SOT-23 Package Information (TA=25℃ unless otherwise noted)



SOT-23		
Dim	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

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