

1. Product Information

1.1 Features

- ☒ Surface-mounted package
- ☒ Low gate charge

1.2 Applications

- ☒ PWM applications
- ☒ Load switch

1.3 Quick reference

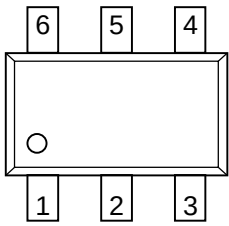
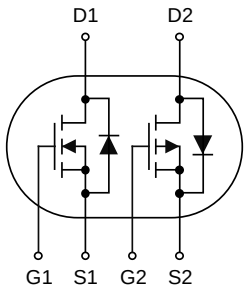
N- Channel

- ☒ $BV \geq 30\text{ V}$
- ☒ $R_{DS(ON)} \leq 24\text{ m}\Omega @ V_{GS} = 10\text{ V}$
- ☒ $I_D \leq 4.2\text{ A}$
- ☒ $R_{DS(ON)} \leq 28\text{ m}\Omega @ V_{GS} = 4.5\text{ V}$

P- Channel

- ☒ $BV \leq -30\text{ V}$
- ☒ $R_{DS(ON)} \leq 65\text{ m}\Omega @ V_{GS} = -10\text{ V}$
- ☒ $I_D \geq -3.7\text{ A}$
- ☒ $R_{DS(ON)} \leq 85\text{ m}\Omega @ V_{GS} = -4.5\text{ V}$

2. Pin Description

Pin	Description	Simplified Outline	Symbol
1	Gate(G1)	 Top View SOT23-6L	
2	Source(S2)		
3	Gate(G2)		
4	Drain(D2)		
5	Source(S1)		
6	Drain(D1)		

3. Limiting Values

Symbol	Parameter		Limit		Unit
			N	P	
V _{DS}	Drain-Source Voltage		30	-30	V
V _{GS}	Gate-Source Voltage		±12	±12	V
I _D *	Drain Current	T _A =25°C	4	-3.7	A
		T _A =75°C	3	-2.1	A
I _{DM} *, **	Pulsed Drain Current		20	-15	A
P _{tot}	Maximum Power Dissipation		1.2		W
T _J , T _{stg}	Operating Junction and Storage Temperature Range		-55 to 150		°C
R _{θJA} *	Thermal Resistance-Junction to Ambient		104	104	°C/W

Notes:

- * Surface Mounted on 1 in² pad area, $t \leq 10$ sec.
- ** Pulse width $\leq 300 \mu\text{s}$, duty cycle $\leq 2\%$.
- *** Limited by bonding wire.

4. Marking Information

Product Name	Marking
KJ3003CS	3003 YYWW YYWW: Date Code

5. Ordering Code

Product Name	Package	Reel Size	Tape width	Quantity(pcs)	Note
KJ3003CS	SOT23-6L	7"	8 mm	3000	

Note: KUAIJIEXIN defines "Green" as lead-free (RoHS compliant) and halogen free (Br or Cl does not exceed 900 ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500 ppm by weight; Follow IEC 61249-2-21 and IPC/JEDEC J-STD-020C)

6. Electrical Characteristics (T_A=25°C Unless Otherwise Noted)

N-Channel

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0 V, I _{DS} =250 μA	30	-	-	V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250 μA	0.7	-	1.3	V
I _{DSS}	Drain Leakage Current	V _{DS} =30 V, V _{GS} =0 V	-	-	1	μA
I _{GSS}	Gate Leakage Current	V _{GS} =±12 V, V _{DS} =0 V	-	-	±100	nA
R _{DS(ON)} ^a	On-State Resistance	V _{GS} =10 V, I _D =4.2 A	-	19	24	mΩ
		V _{GS} =4.5 V, I _D =2 A	-	24	28	
g _{fs} ^a	Forward transconductance	V _{DS} =5 V, I _D =3.1 A	-	4	-	S
Dynamic Characteristics ^b						
C _{iss}	Input Capacitance	V _{DS} =15 V, V _{GS} =0 V, F=1 MHz	-	210	-	pF
C _{oss}	Output Capacitance		-	35	-	
C _{rss}	Reverse Transfer Capacitance		-	23	-	
t _{d(on)}	Turn-on Delay Time	V _{DS} =15 V, V _{GS} =10 V, R _L =3 Ω, R _{GEN} =6 Ω	-	4.5	-	ns
t _r	Turn-on Rise Time		-	1.5	-	
t _{d(off)}	Turn-off Delay Time		-	18.5	-	
t _f	Turn-off Fall Time		-	15.5	-	
Gate Charge Characteristics ^b						
Q _g	Total Gate Charge	V _{DS} =15 V, V _{GS} =10 V, I _{DS} =3.5 A	-	5	-	nC
Q _{gs}	Gate-Source Charge		-	0.55	-	
Q _{gd}	Gate-Drain Charge		-	1	-	
Diode Characteristics						
V _{SD} ^a	Diode Forward Voltage	I _{SD} =3.5 A, V _{GS} =0 V	-	0.8	1.2	V
I _S	Diode Forward Current		-	-	3.5	A

Notes:

a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.

b. Guaranteed by design, not subject to production testing.

P-Channel

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0 V, I _{DS} =-250 μA	-30	-	-	V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =-250 μA	-0.7	-	-1.3	V
I _{DSS}	Drain Leakage Current	V _{DS} =-30 V, V _{GS} =0 V	-	-	-1	μA
I _{GSS}	Gate Leakage Current	V _{GS} =±12 V, V _{DS} =0 V	-	-	±100	nA
R _{DS(ON)} ^a	On-State Resistance	V _{GS} =-10 V, I _D =-3.7 A	-	50	65	mΩ
		V _{GS} =-4.5 V, I _D =-2 A	-	60	85	
g _{fs} ^a	Forward transconductance	V _{DS} =-5 V, I _D =-2.7 A	-	2	-	S
Dynamic Characteristics ^b						
C _{iss}	Input Capacitance	V _{DS} =-15 V, V _{GS} =0 V, F=1 MHz	-	199	-	pF
C _{oss}	Output Capacitance		-	47	-	
C _{rss}	Reverse Transfer Capacitance		-	28	-	
t _{d(on)}	Turn-on Delay Time	V _{DS} =-15 V, V _{GS} =-10 V, R _L =15 Ω, R _{GEN} =6 Ω	-	8	-	ns
t _r	Turn-on Rise Time		-	5	-	
t _{d(off)}	Turn-off Delay Time		-	12	-	
t _f	Turn-off Fall Time		-	4	-	
Gate Charge Characteristics ^b						
Q _g	Total Gate Charge	V _{DS} =-15 V, V _{GS} =-10 V, I _{DS} =-2.7 A	-	8	-	nC
Q _{gs}	Gate-Source Charge		-	0.7	-	
Q _{gd}	Gate-Drain Charge		-	1.1	-	
Diode Characteristics						
V _{SD} ^a	Diode Forward Voltage	I _{SD} =-2.7 A, V _{GS} =0 V	-	-	-1.2	V
I _S	Diode Forward Current		-	-	-2.7	A

Notes:

- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%
- b. Guaranteed by design, not subject to production testing

7. Typical Characteristics

N-Channel

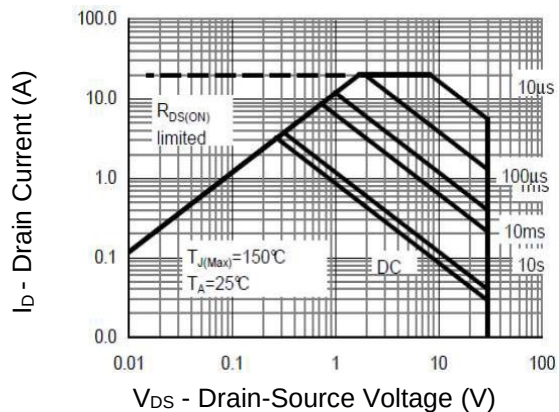


Figure 1. Safe Operation Area

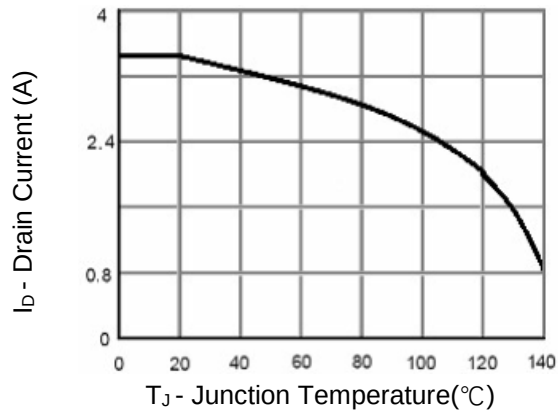


Figure 2. Drain Current

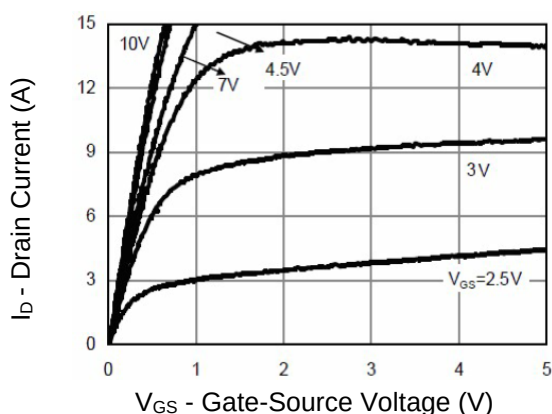


Figure 3. Output Characteristics

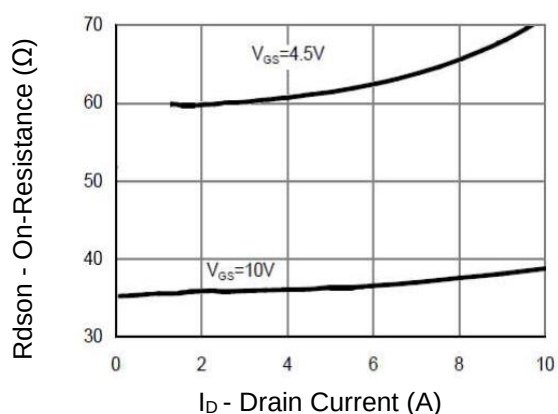


Figure 4. Drain-Source On-Resistance

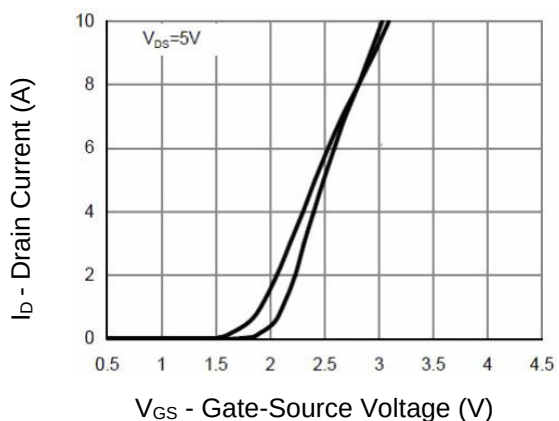


Figure 5. Transfer Characteristics

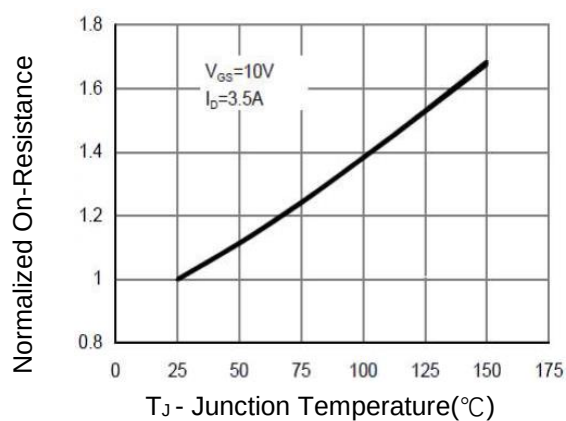


Figure 6. Drain-Source On-Resistance

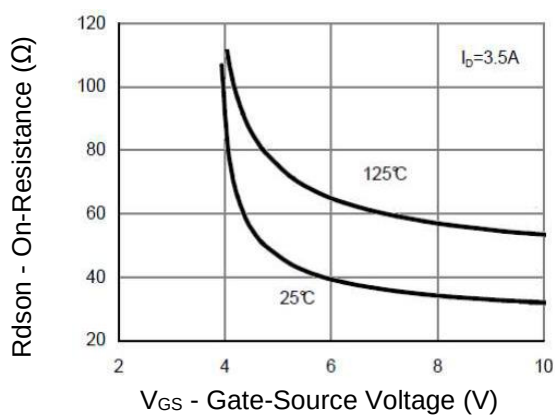


Figure 7. $R_{DS(ON)}$ vs V_{GS}

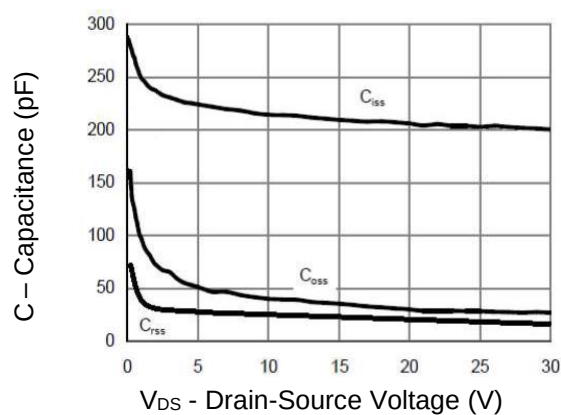


Figure 8. Capacitance vs V_{DS}

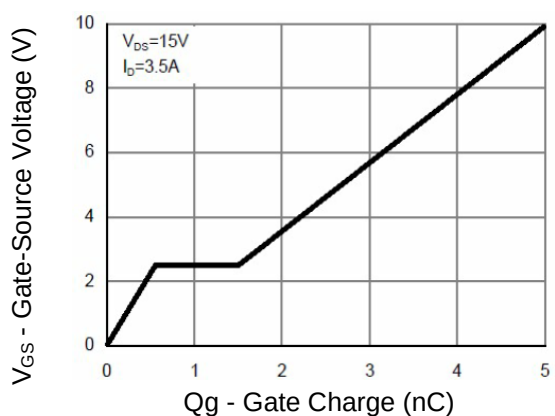


Figure 9. Gate Charge

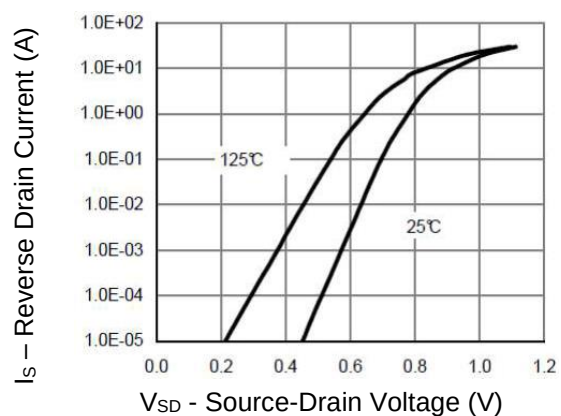


Figure 10. Source- Drain Diode Forward

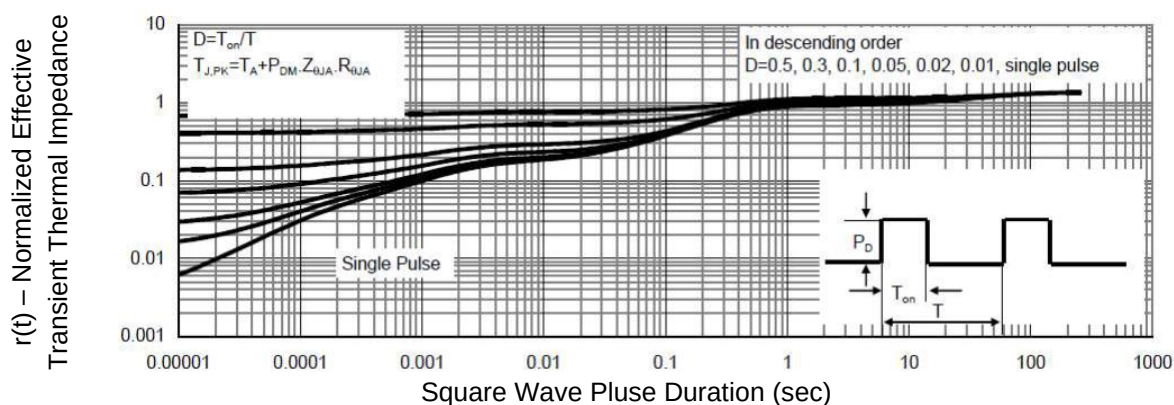


Figure 11. Normalized Maximum Transient Thermal Impedance

7. Typical Characteristics (cont.)

P-Channel

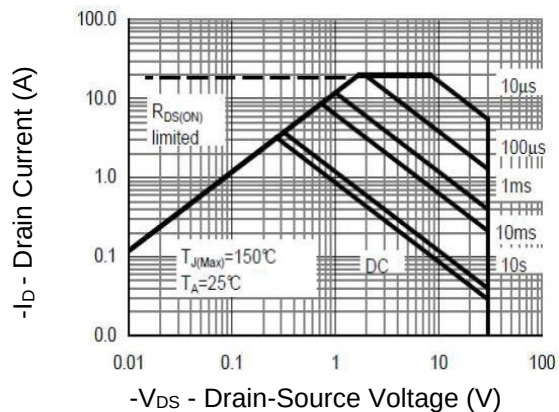


Figure 1. Safe Operation Area

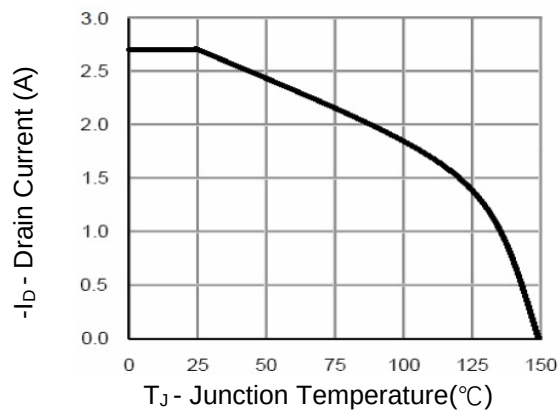


Figure 2. Drain Current

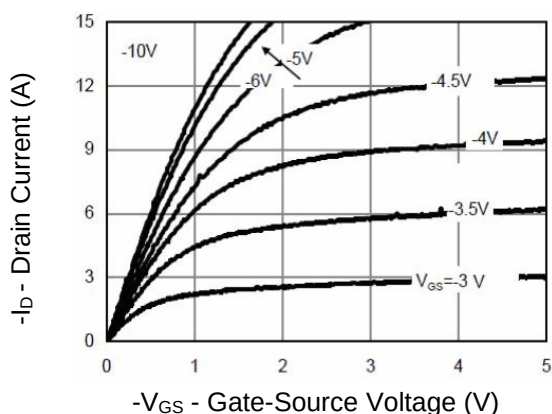


Figure 3. Output Characteristics

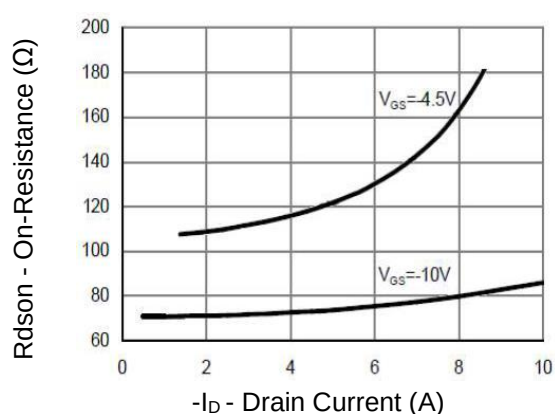


Figure 4. Drain-Source On-Resistance

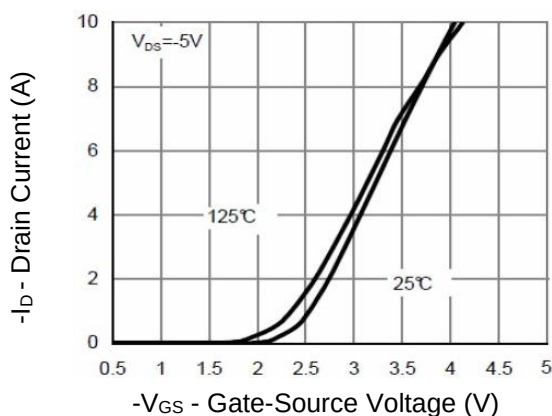


Figure 5. Transfer Characteristics

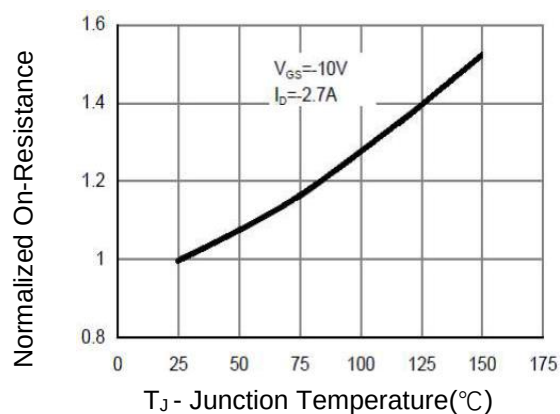


Figure 6. Drain-Source On-Resistance

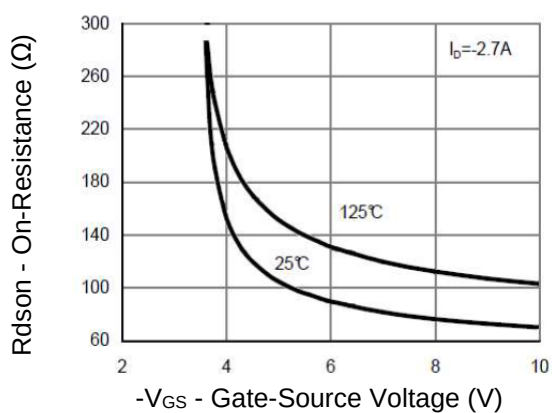


Figure 7. $R_{DS(ON)}$ vs V_{GS}

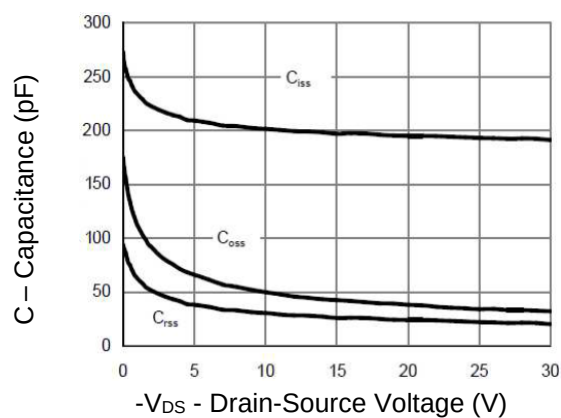


Figure 8. Capacitance vs V_{DS}

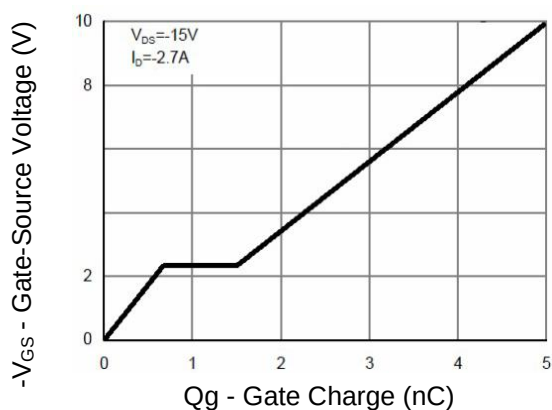


Figure 9. Gate Charge

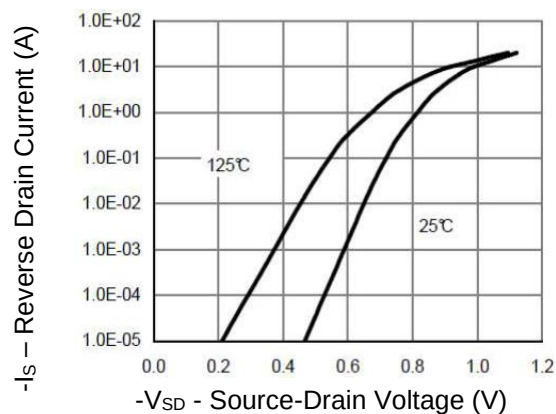


Figure 10. Source- Drain Diode Forward

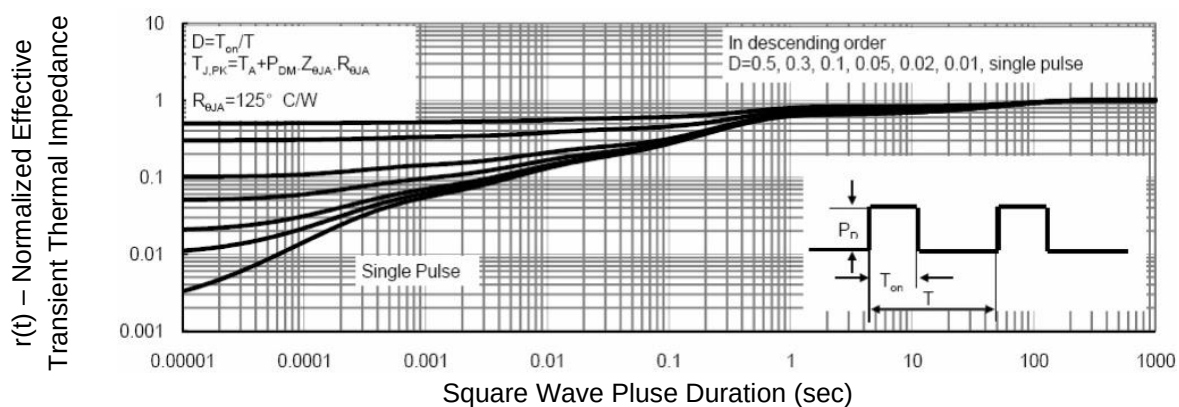
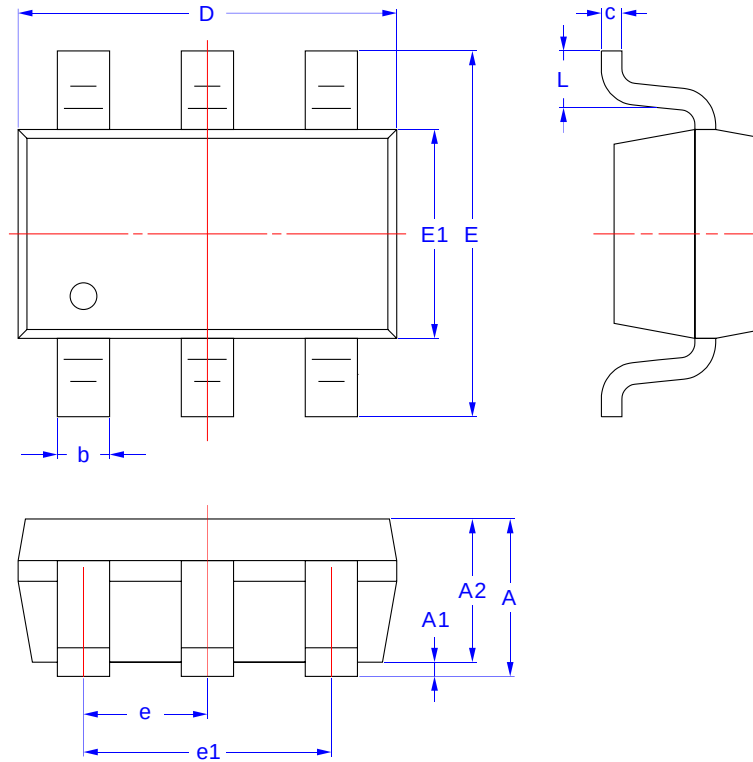


Figure 11. Normalized Maximum Transient Thermal Impedance

7. Package Dimensions

SOT23-6L Package



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	1.05	1.25
A1	0.00	0.10
A2	1.05	1.15
b	0.30	0.50
c	0.10	0.20
D	2.82	3.02
E	2.65	2.95
E1	1.50	1.70
e	0.95 BSC	
e1	1.90 BSC	
L	0.30	0.60