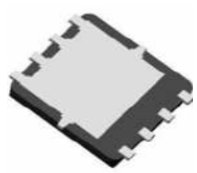
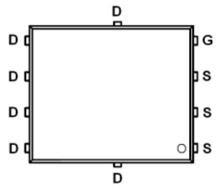
Main Product Characteristics:

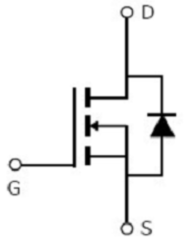
V_{DSS}	40V
$R_{DS}(on)$	4.4mohm(typ.)
I_D	145A



PQFN 5x6



Marking and Pin Assignment



Schematic Diagram

Features and Benefits:

- Advanced MOSFET process technology
- Special designed for PWM, load switching and general purpose applications
- Ultra low on-resistance with low gate charge
- Fast switching and reverse body recovery
- 150℃ operating temperature

Description:

It utilizes the latest trench processing techniques to achieve the high cell density and reduces the on-resistance with high repetitive avalanche rating. These features combine to make this design an extremely efficient and reliable device for use in power switching application and a wide variety of other applications

Absolute max Rating:

Symbol	Parameter	Max.	Units
I_D @ TC = 25°C	Continuous Drain Current, V_{GS} @ 10V ①	145	A
I_D @ TC = 100°C	Continuous Drain Current, V_{GS} @ 10V ①	100	
I_{DM}	Pulsed Drain Current ②	580	
P_D @TC = 25°C	Power Dissipation ③	153	W
	Linear Derating Factor	1.02	W/°C
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-to-Source Voltage	± 20	V
E_{AS}	Single Pulse Avalanche Energy @ L=0.5mH	625	mJ
I_{AS}	Avalanche Current @ L=0.5mH	50	A
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to + 150	°C

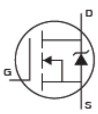
Thermal Resistance

Symbol	Characterizes	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case ③	—	0.98	℃/W
$R_{\theta JA}$	Junction-to-ambient (t ≤ 10s) ④	—	62	℃/W
	Junction-to-Ambient (PCB mounted, steady-state) ④	—	40	℃/W

Electrical Characterizes @T_A=25℃ unless otherwise specified

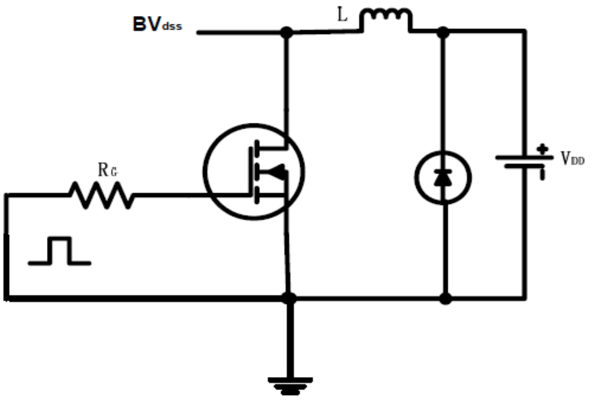
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	40	—	—	V	V_{GS} = 0V, I_D = 250μA
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	4.4	6	mΩ	V_{GS}=10V,I_D = 30A
		—	9.9	—		T_J = 125°C
$V_{GS(th)}$	Gate threshold voltage	1	—	3	V	V_{DS} = V_{GS}, I_D = 250μA
		—	0.66	—		T_J = 125°C
I_{DSS}	Drain-to-Source leakage current	—	—	1	μA	V_{DS} = 40V,V_{GS} = 0V
		—	—	50		T_J = 125°C
I_{GSS}	Gate-to-Source forward leakage	—	—	100	nA	V_{GS} =20V
		—	—	-100		V_{GS} = -20V
Q_g	Total gate charge	—	52.3	—	nC	I_D = 20A,
Q_{gs}	Gate-to-Source charge	—	20.3	—		V_{DS}=15V,
Q_{gd}	Gate-to-Drain("Miller") charge	—	23.1	—		V_{GS} = 4.5V
$t_{d(on)}$	Turn-on delay time	—	20.1	—	nS	V_{GS}=10V, V_{DS} =30V,
t_r	Rise time	—	59.1	—		R_{GEN}=2.5Ω
$t_{d(off)}$	Turn-Off delay time	—	159.3	—		I_D =14A
t_f	Fall time	—	110.5	—		
C_{iss}	Input capacitance	—	5756	—	pF	V_{GS} = 0V
C_{oss}	Output capacitance	—	493	—		V_{DS} = 25V
C_{rss}	Reverse transfer capacitance	—	481	—		f =1MHz

Source-Drain Ratings and Characteristics

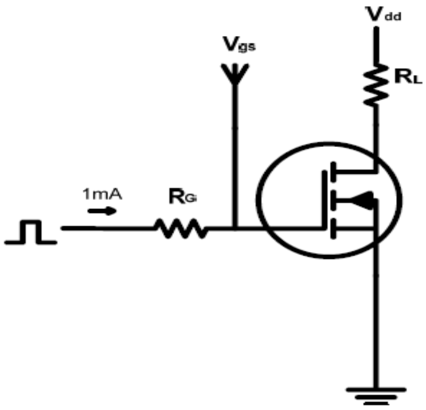
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode) ①	—	—	145	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode)	—	—	580	A	
V_{SD}	Diode Forward Voltage	—	0.85	1.3	V	I_S=30A, V_{GS}=0V
t_{rr}	Reverse Recovery Time	—	30.8	—	ns	T_J = 25°C, I_F =20A, di/dt = 100A/μs
Q_{rr}	Reverse Recovery Charge	—	31.1	—	nC	

Test circuits and Waveforms

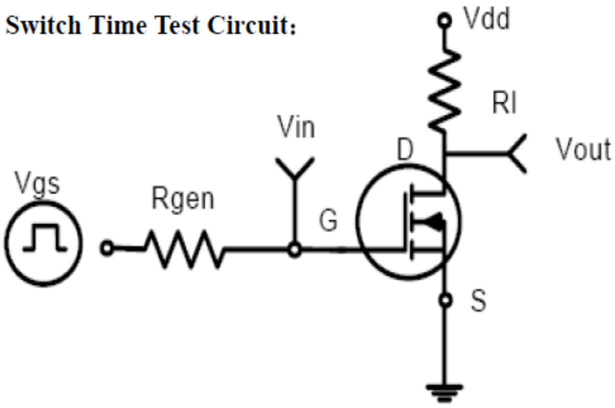
EAS test circuits:



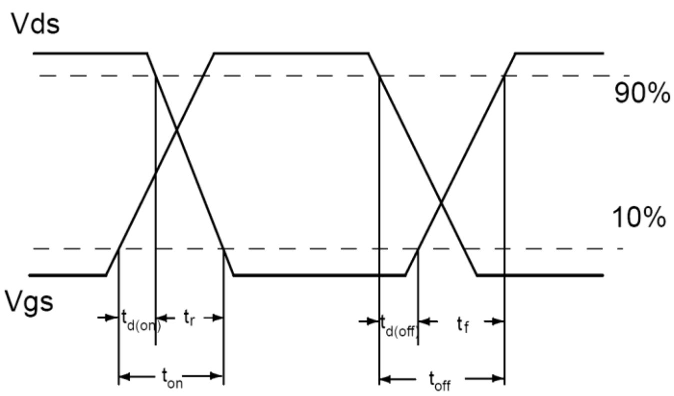
Gate charge test circuit:



Switch Time Test Circuit:



Switch Waveforms:



Notes:

①Calculated continuous current based on maximum allowable junction temperature. Package limitation current is 75A.

②Repetitive rating; pulse width limited by max. junction temperature.

③The power dissipation PD is based on max. junction temperature, using junction-to-case thermal resistance.

④The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with TA =25°C.

Typical electrical and thermal characteristics

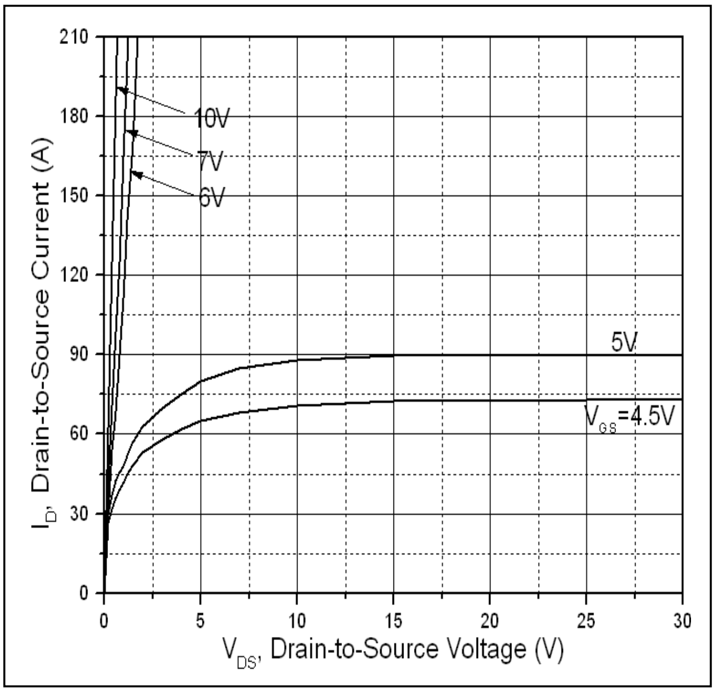


Figure 1. Typical Output Characteristics

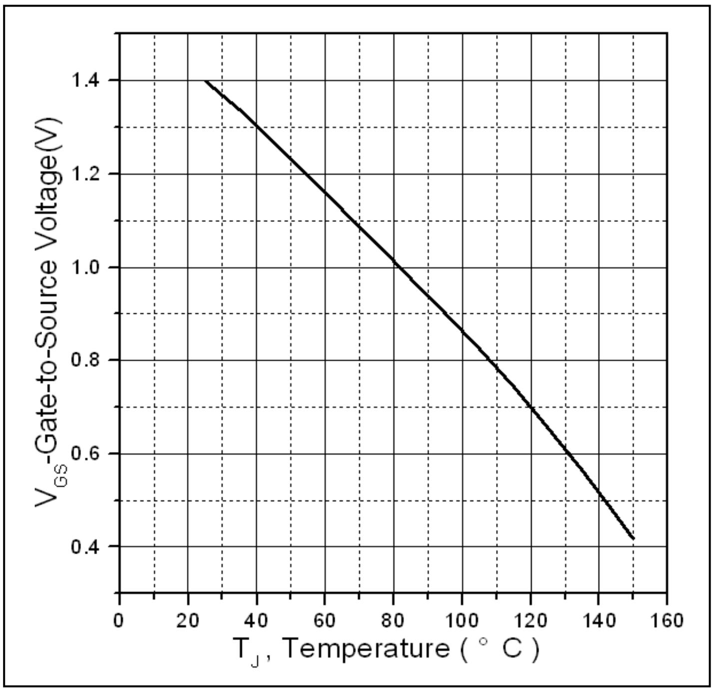


Figure 2. Gate to source cut-off voltage

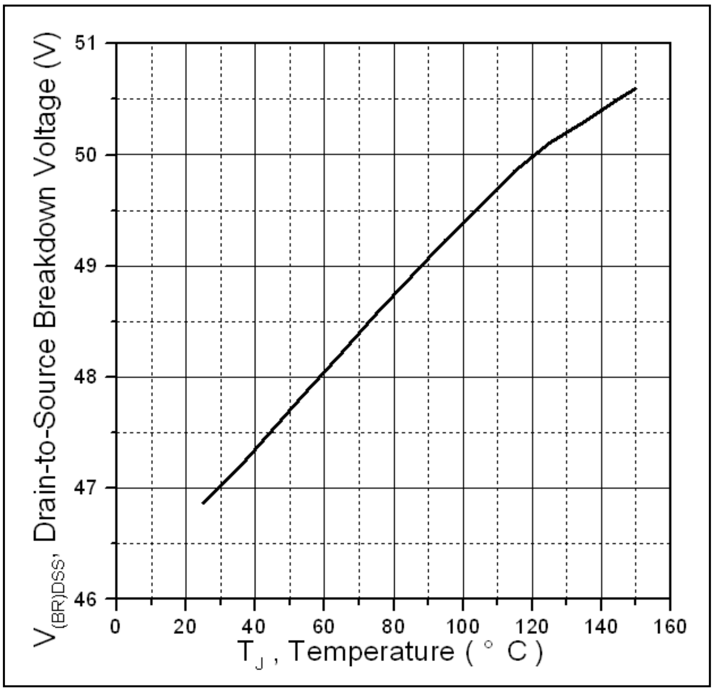


Figure 3. Drain-to-Source Breakdown Voltage vs. Temperature

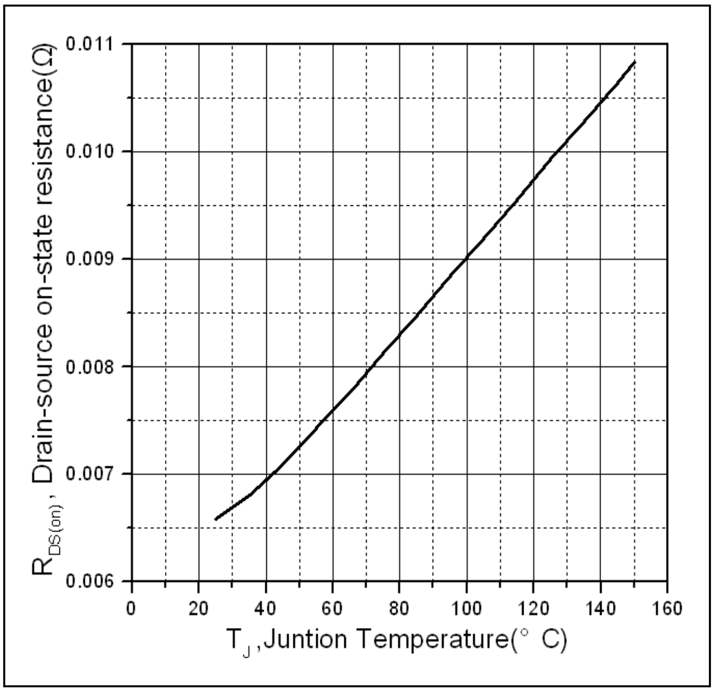
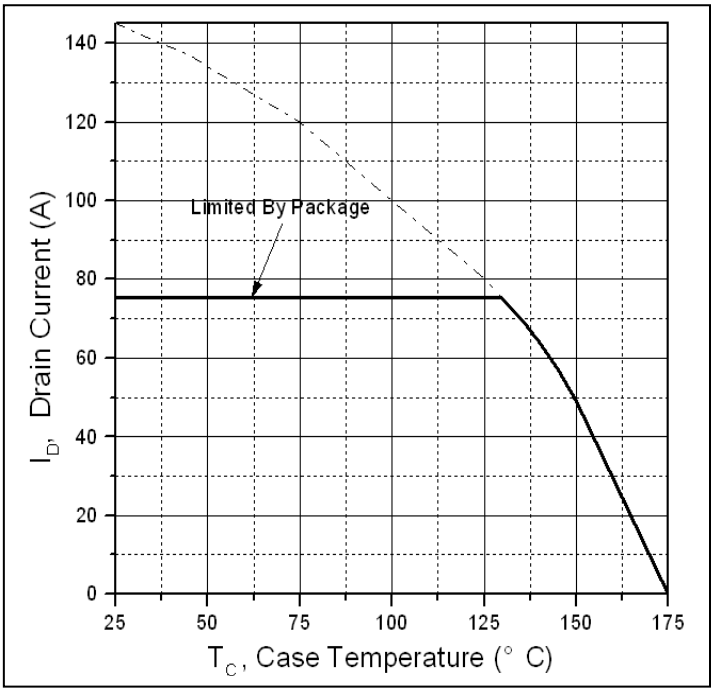


Figure 4. Normalized On-Resistance vs. Case Temperature

Typical electrical and thermal characteristics



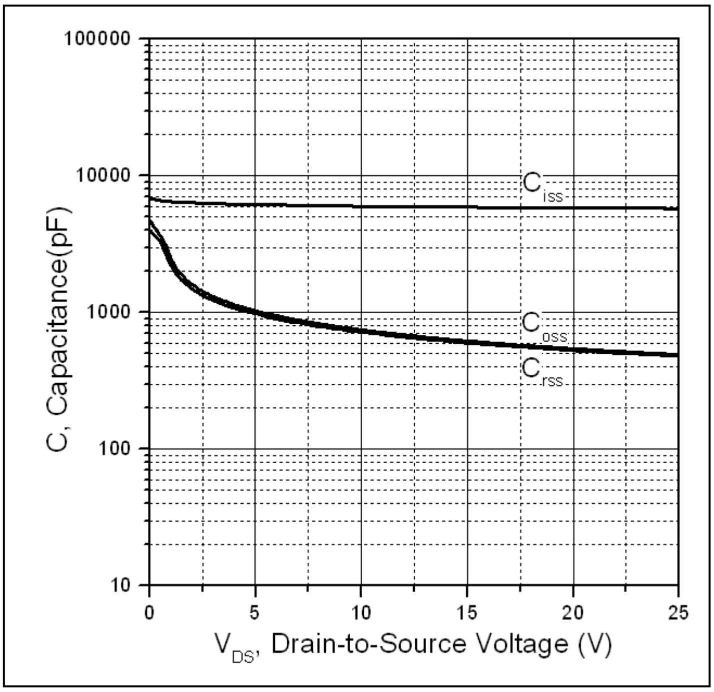


Figure 5. Maximum Drain Current vs. Case Temperature

Figure 6.Typical Capacitance vs. Drain-to-Source Voltage

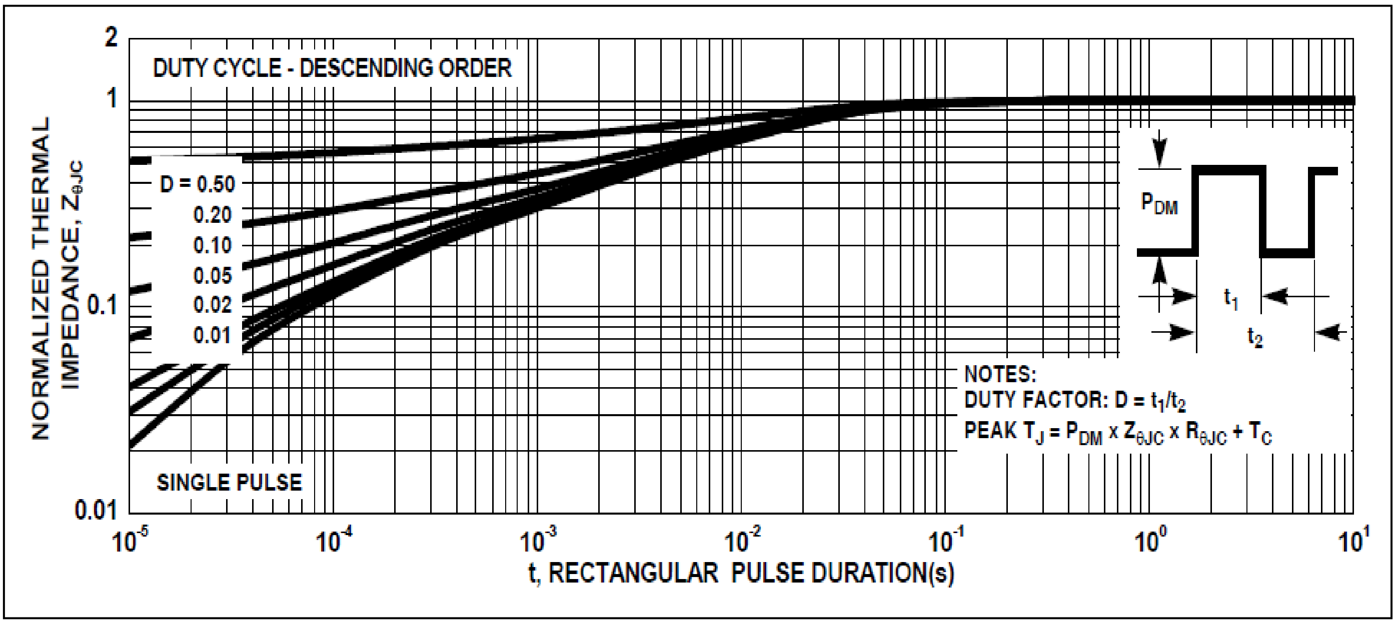
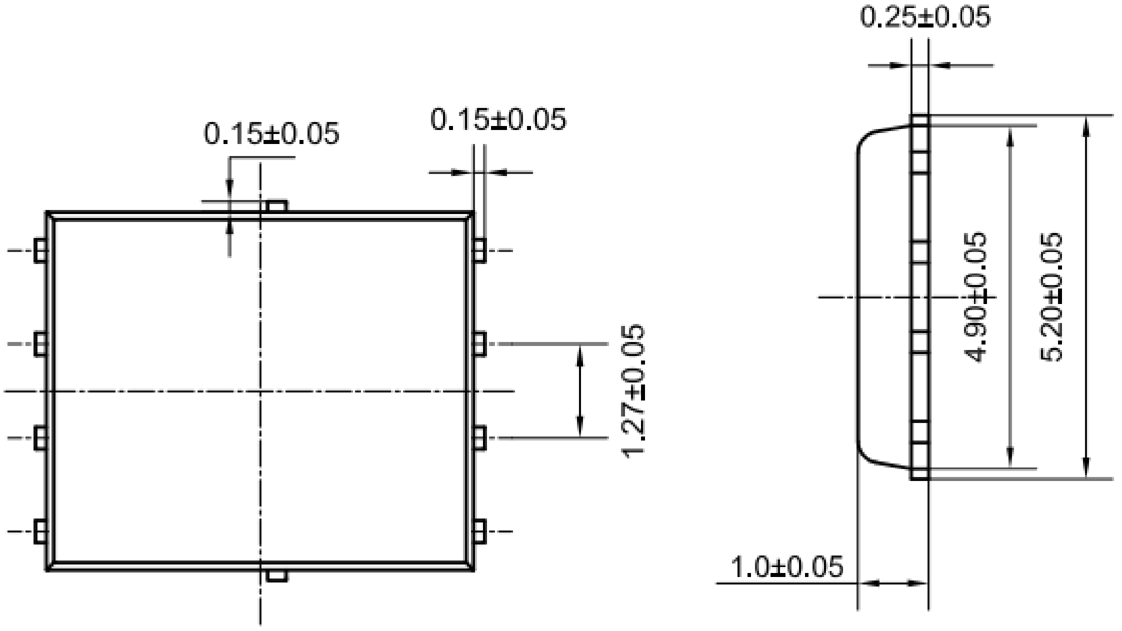
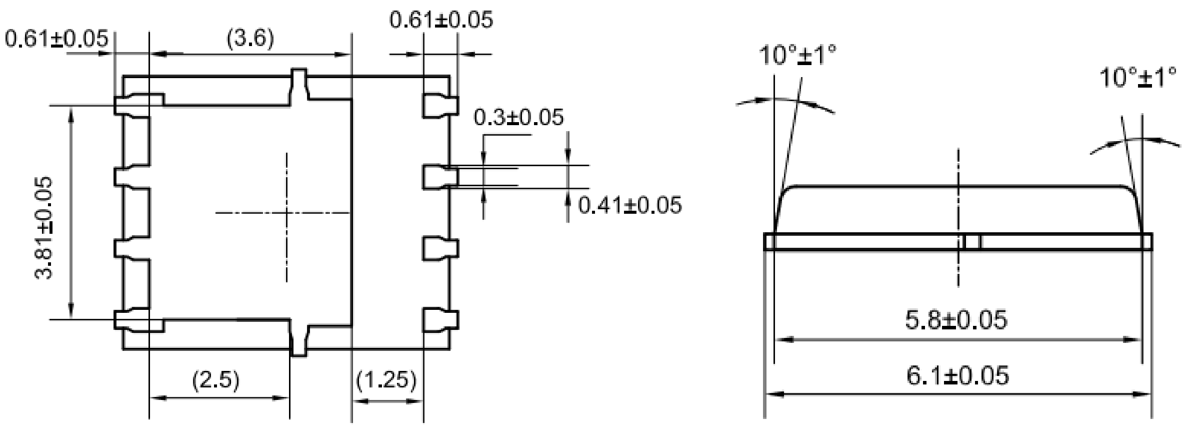


Figure7. Maximum Effective Transient Thermal Impedance, Junction-to-Case

Mechanical Data：

Unit: mm





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Customer Service

Worldwide Sales and Service:

Sales@silikron.com

Technical Support:

Technical@silikron.com

Suzhou Silikron Semiconductor Corp.

501 , NW-20,Nanopolis, 99th Jinjihu Avenue ,Industrial Park ,Suzhou ,P.R, CHINA

TEL: (86-512) 62560688

FAX: (86-512) 62560688-8092

E-mail: Sales@silikron.com