

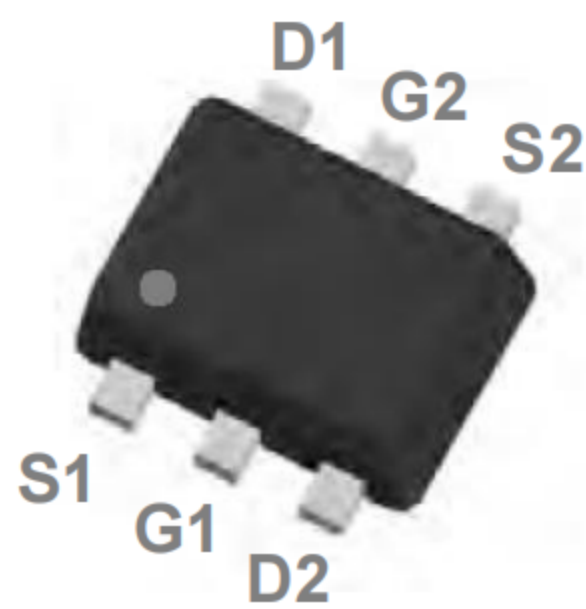
Features

- Fast switching
- Green Device Available
- Suit for 1.5V Gate Drive Applications

Application

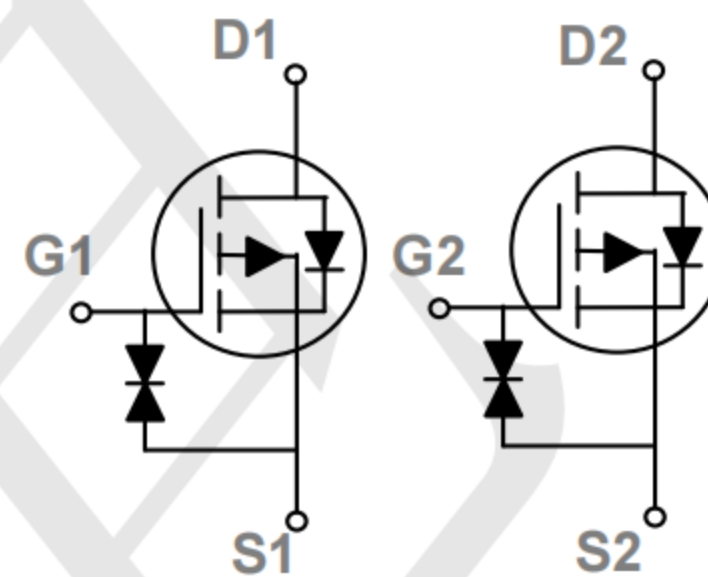
- Notebook
- Load Switch
- Networking
- Hand-held Instruments

Package and Pin Configuration



Marking: TU.R

Circuit diagram



Absolute Maximum Ratings $T_C=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-Source Voltage	± 12	V
I_D	Drain Current – Continuous ($T_C=25^\circ\text{C}$)	-1.2	A
I_{DM}	Drain Current – Pulsed ¹	-2.1	A
P_D	Power Dissipation ($T_C=25^\circ\text{C}$)	312	mW
	Power Dissipation – Derate above 25°C	2.5	mW/ $^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	400	$^\circ\text{C/W}$

Electrical Characteristics ($T_J=25^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-20	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BV_{DSS} Temperature Coefficient	Reference to 25°C , $I_D=-1\text{mA}$	---	-0.01	---	$V/^\circ\text{C}$
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=-20V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	-1	μA
		$V_{DS}=-16V, V_{GS}=0V, T_J=125^\circ\text{C}$	---	---	-10	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$	---	---	± 20	μA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=-4.5V, I_D=-0.5A$	---	400	600	$m\Omega$
		$V_{GS}=-2.5V, I_D=-0.5A$	---	570	700	
		$V_{GS}=-1.8V, I_D=-0.1A$	---	800	1100	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=-250\mu A$	-0.5	-0.75	1.0	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	3	---	$mV/^\circ\text{C}$

Dynamic and switching Characteristics

Q_g	Total Gate Charge ^{2,3}		---	0.5		nC
Q_{gs}	Gate-Source Charge ^{2,3}	$V_{DS}=-10V, V_{GS}=-4.5V, I_D=-1A$	---	0.28		
Q_{gd}	Gate-Drain Charge ^{2,3}		---	0.28		
$T_{d(on)}$	Turn-On Delay Time ^{2,3}	$V_{DD}=-10V, V_{GS}=-4.5V, R_G=6\Omega$ $I_D=-1A$	---	0.4		ns
T_r	Rise Time ^{2,3}		---	0.06		
$T_{d(off)}$	Turn-Off Delay Time ^{2,3}		---	0.02		
T_f	Fall Time ^{2,3}		---	0.8		
C_{iss}	Input Capacitance	$V_{DS}=-10V, V_{GS}=0V, F=1\text{MHz}$	---	55		pF
C_{oss}	Output Capacitance		---	6		
C_{rss}	Reverse Transfer Capacitance		---	4.5		

Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_S=-0.2A, T_J=25^\circ\text{C}$	---	-0.75	-1.1	V

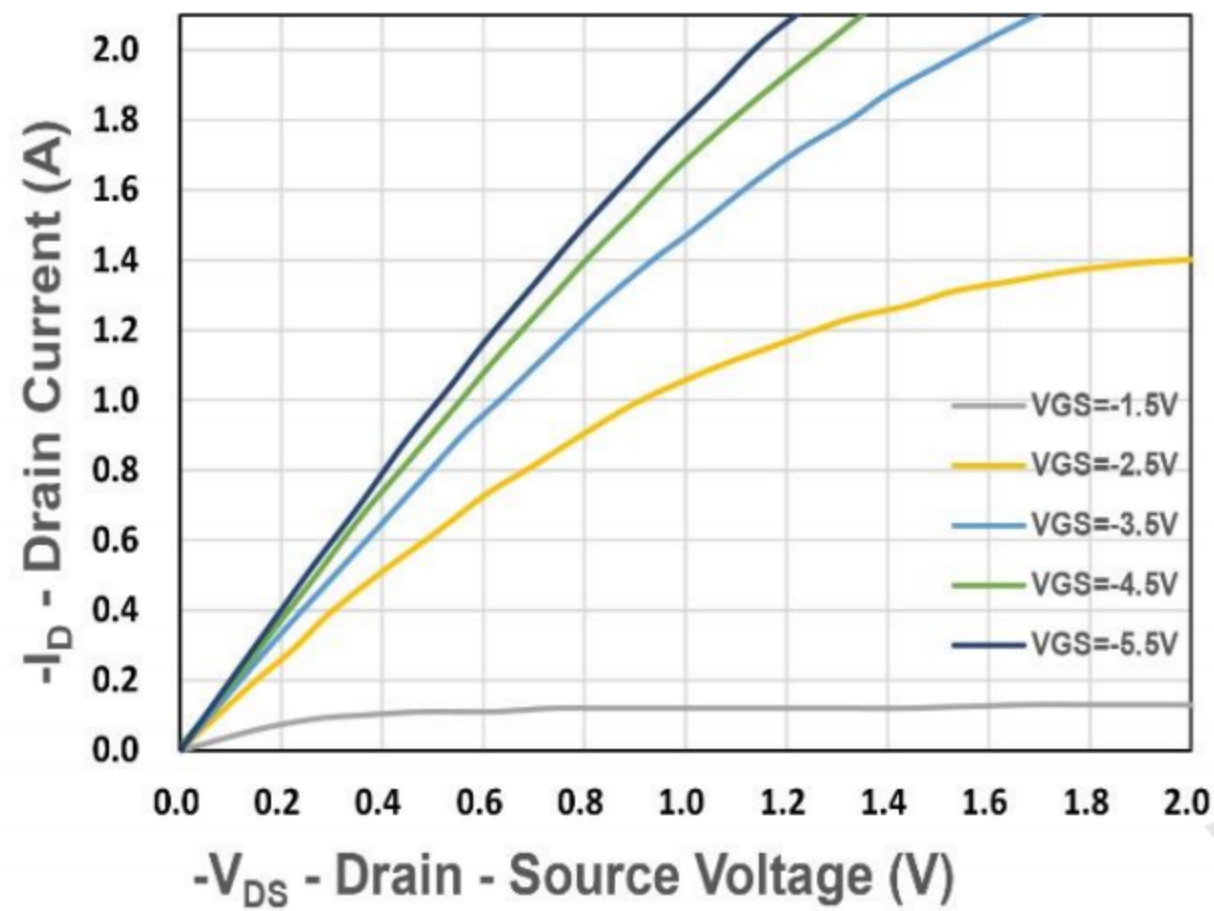


Figure 1. Output Characteristics

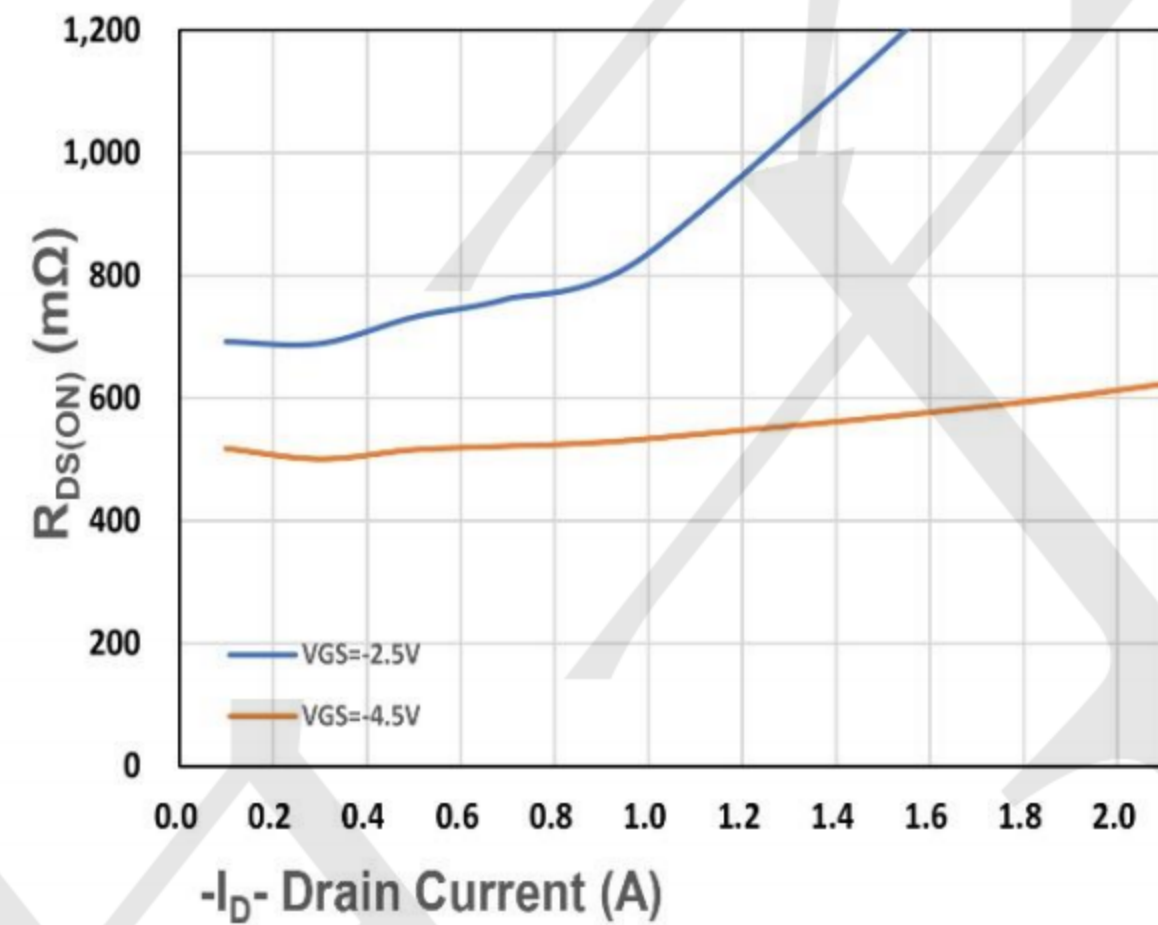


Figure 2. On-Resistance vs. I_D

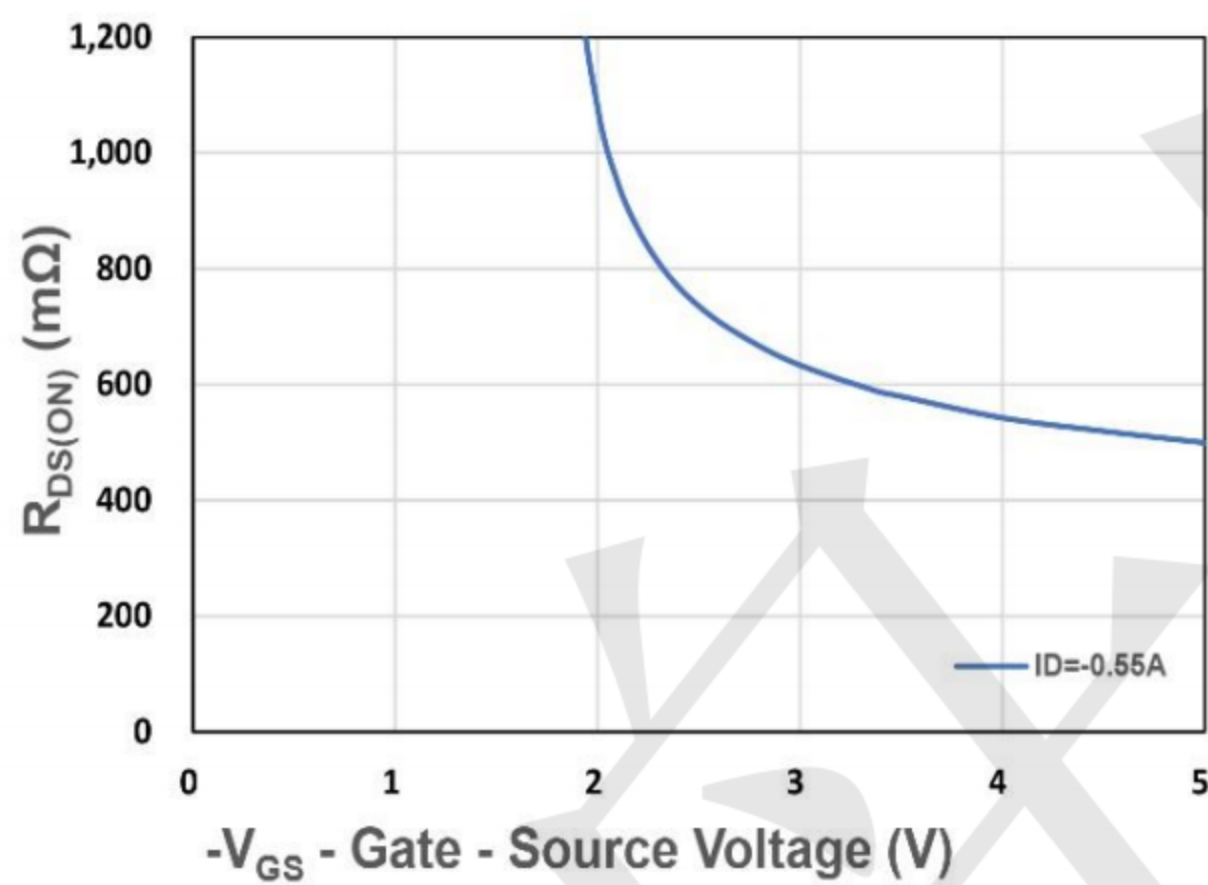


Figure 3. On-Resistance vs. V_{GS}

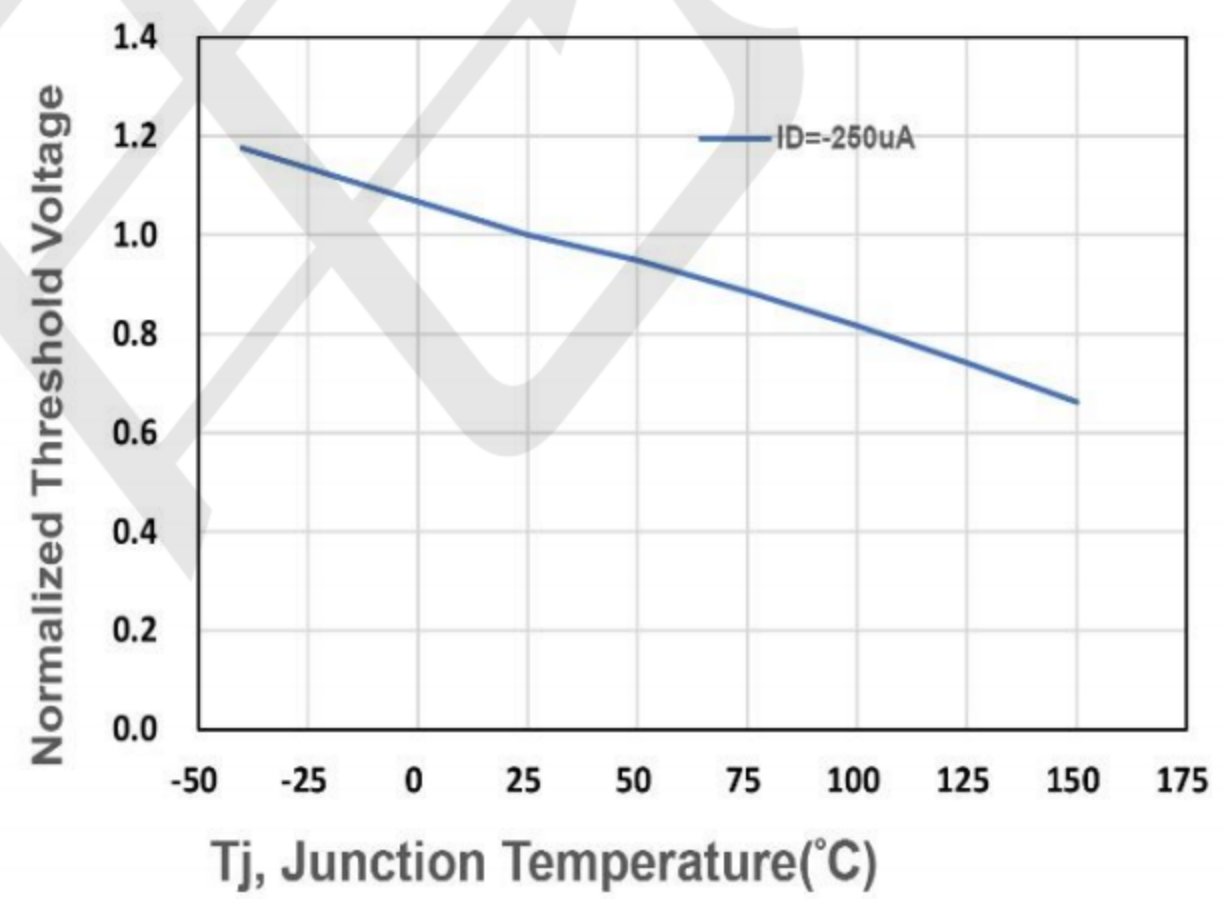


Figure 4. Gate Threshold Voltage

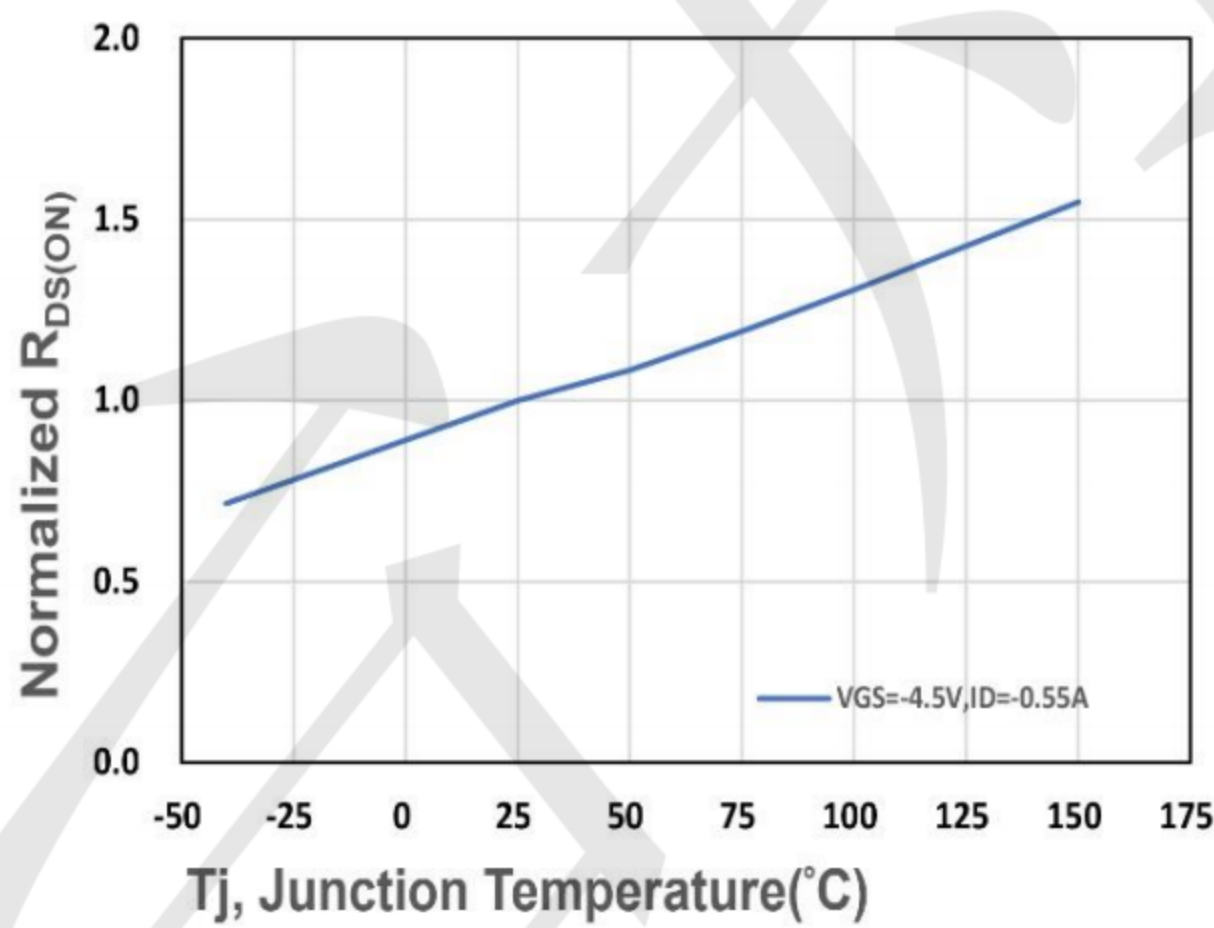


Figure 5. Drain-Source On Resistance

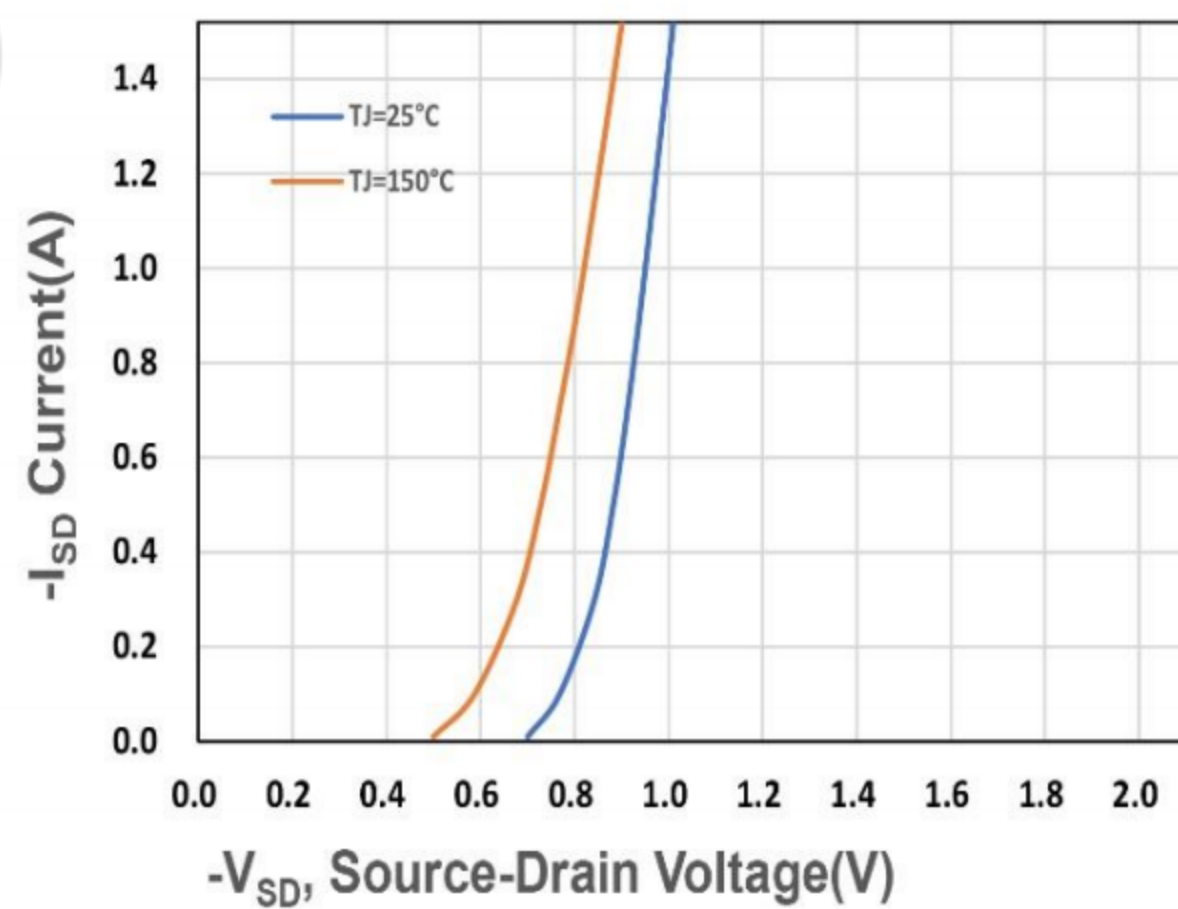


Figure 6. Source-Drain Diode Forward

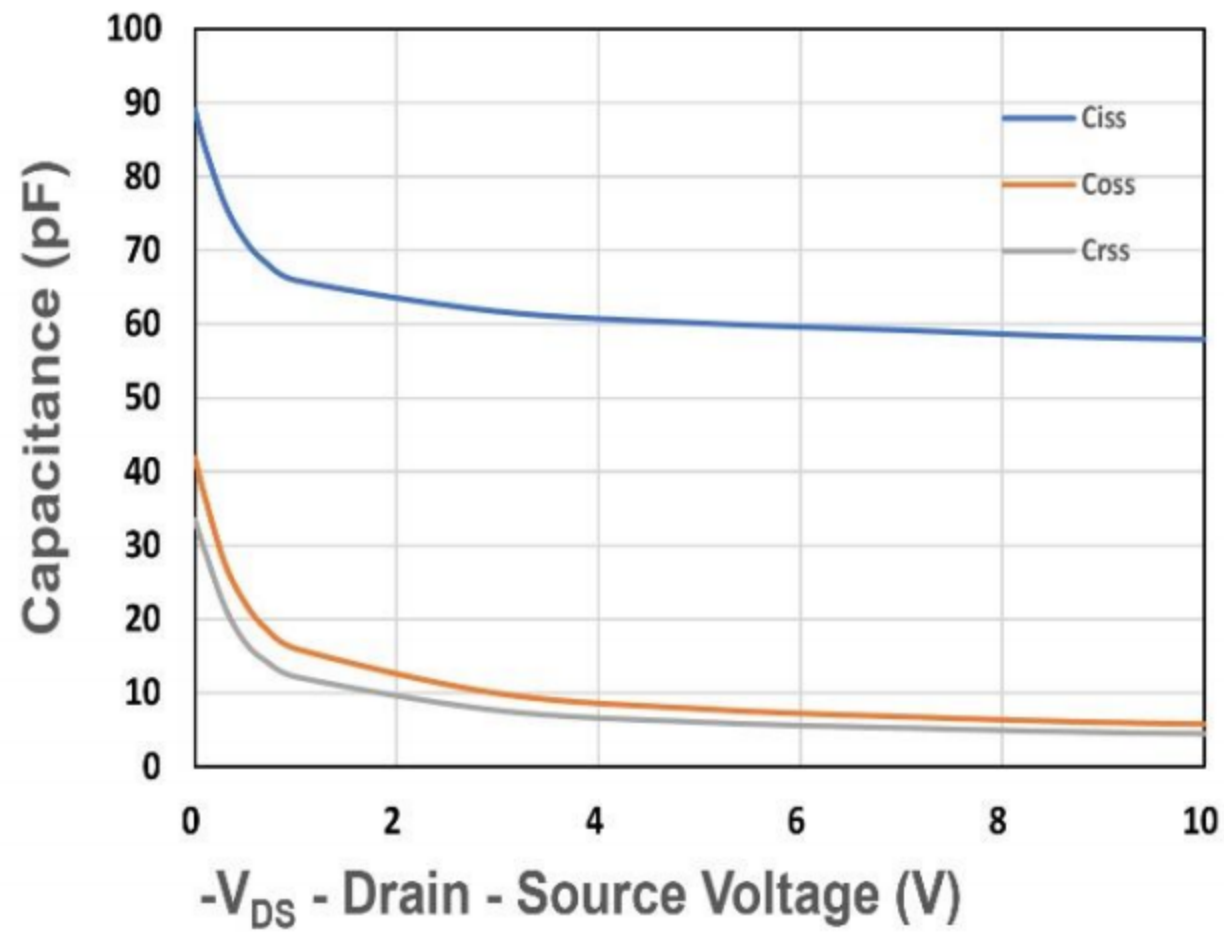


Figure 7. Capacitance

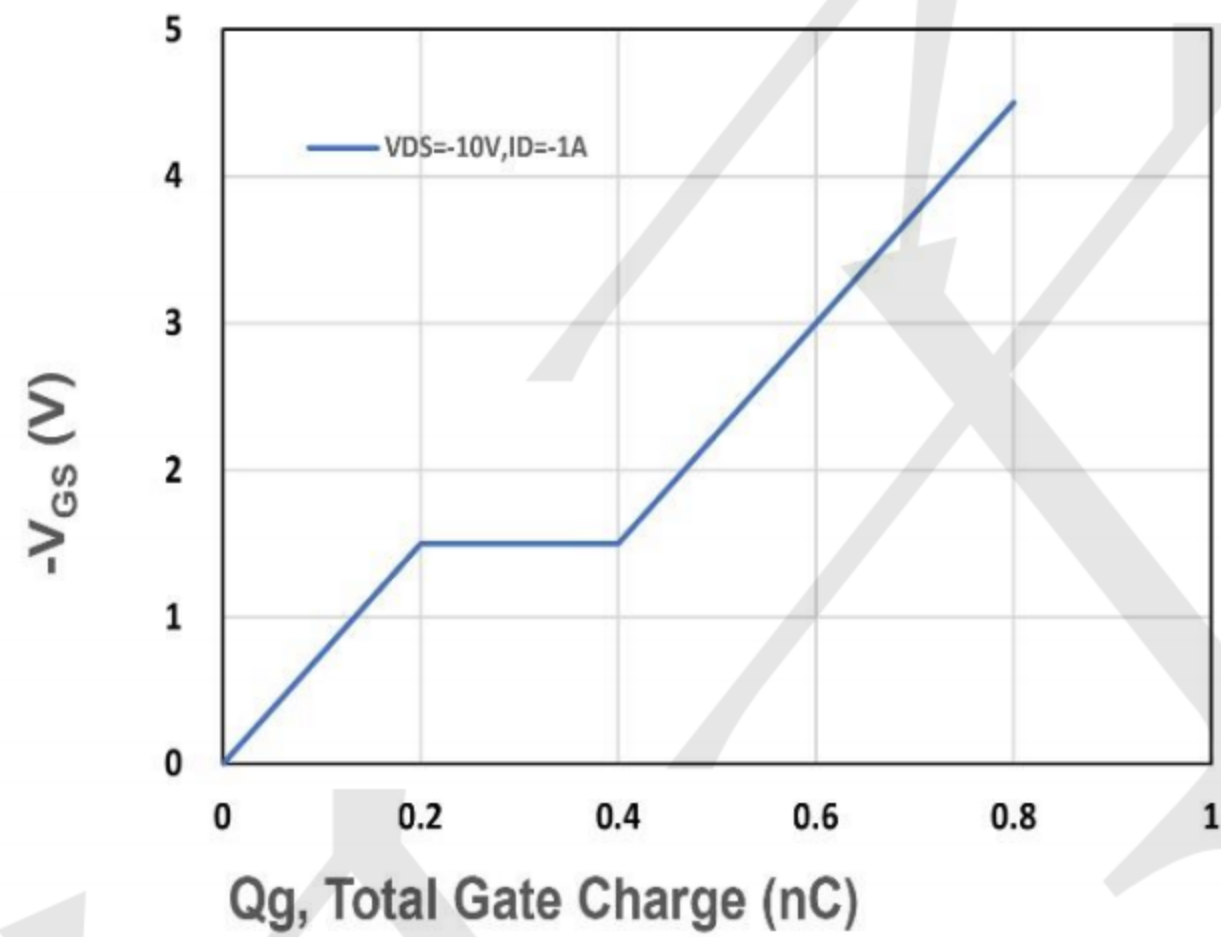


Figure 8. Gate Charge Characteristics

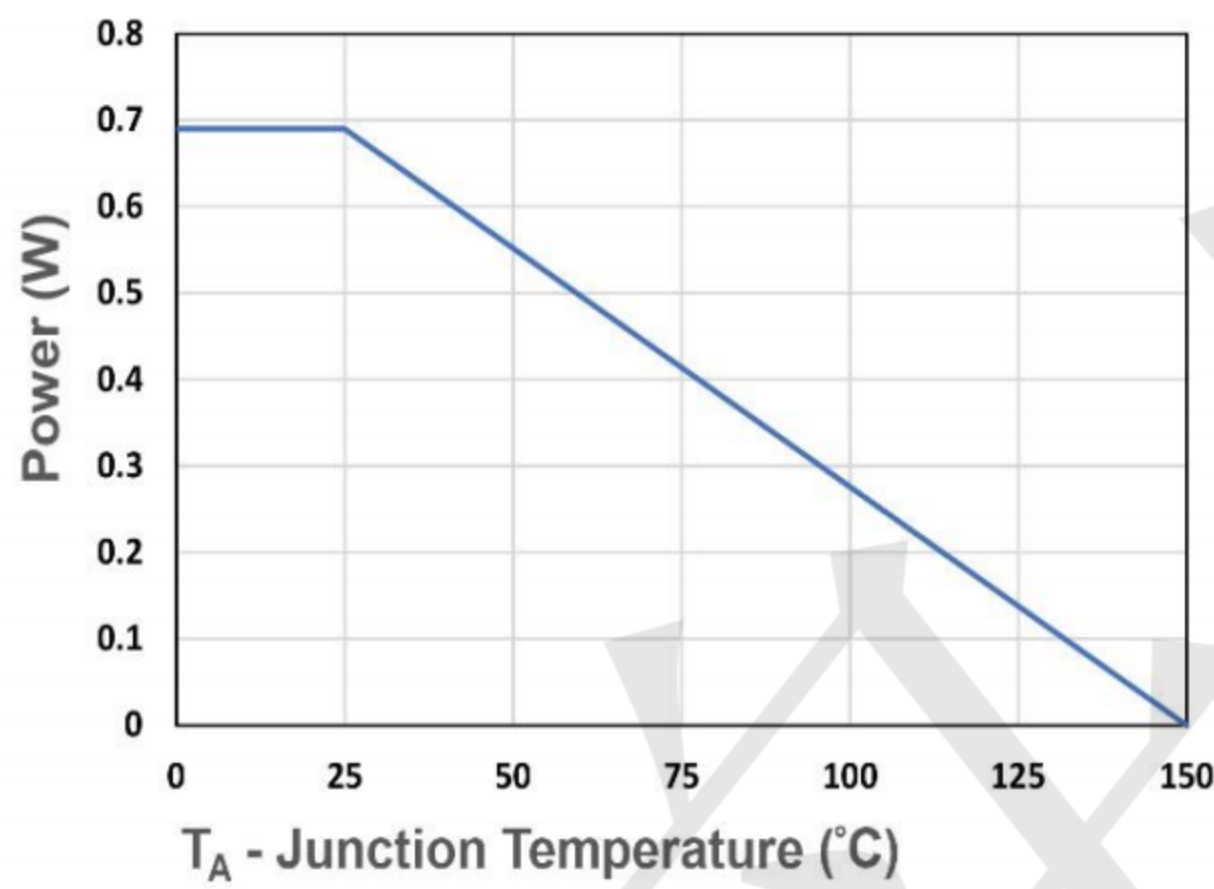


Figure 9. Power Dissipation

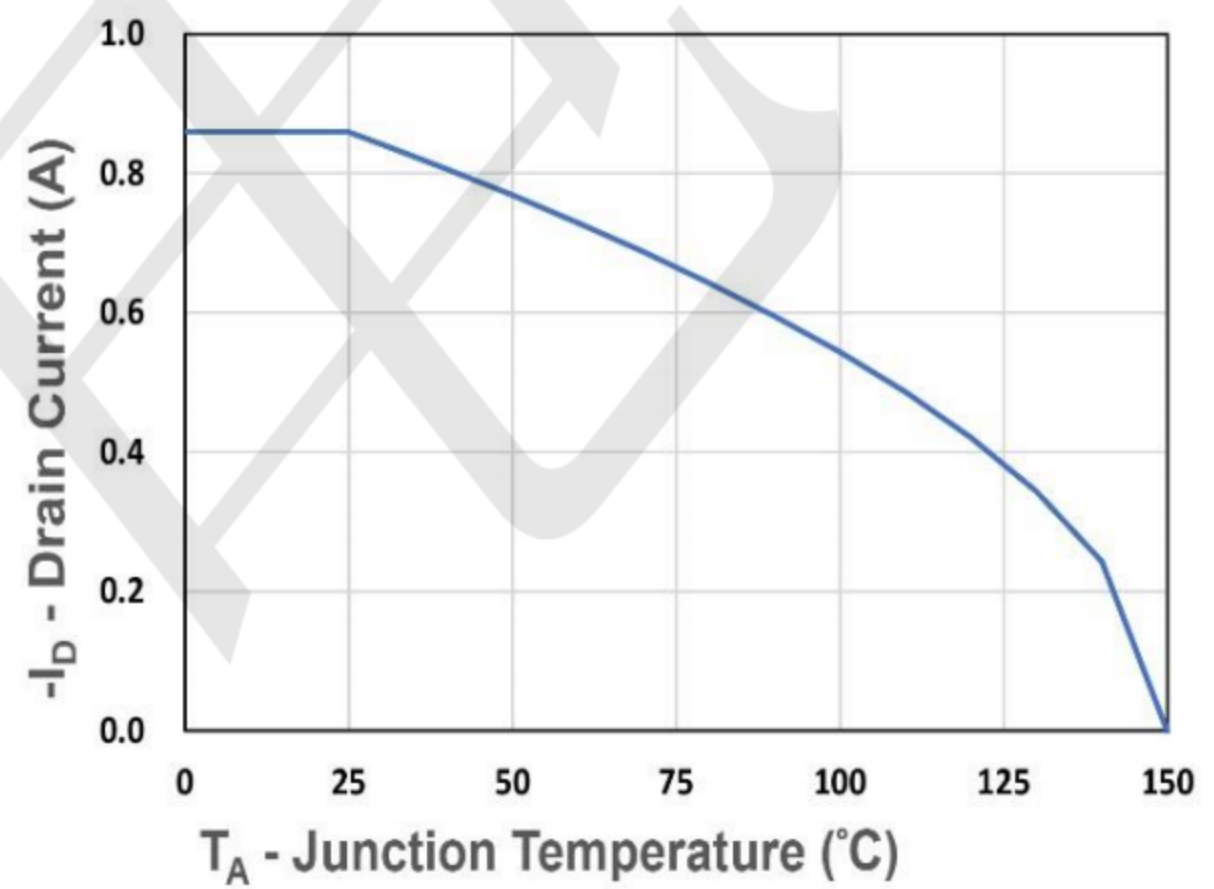


Figure 10. Drain Current

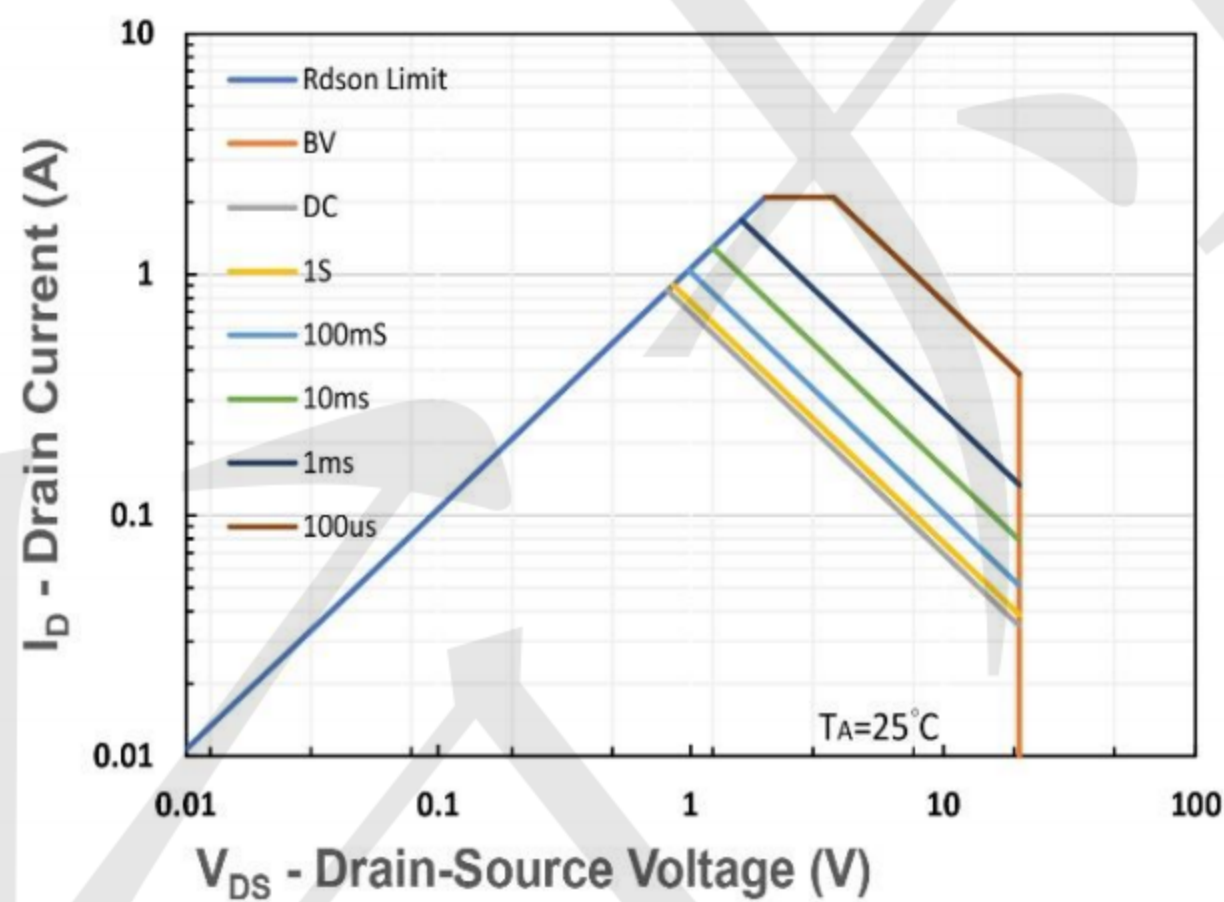


Figure 11. Safe Operating Area

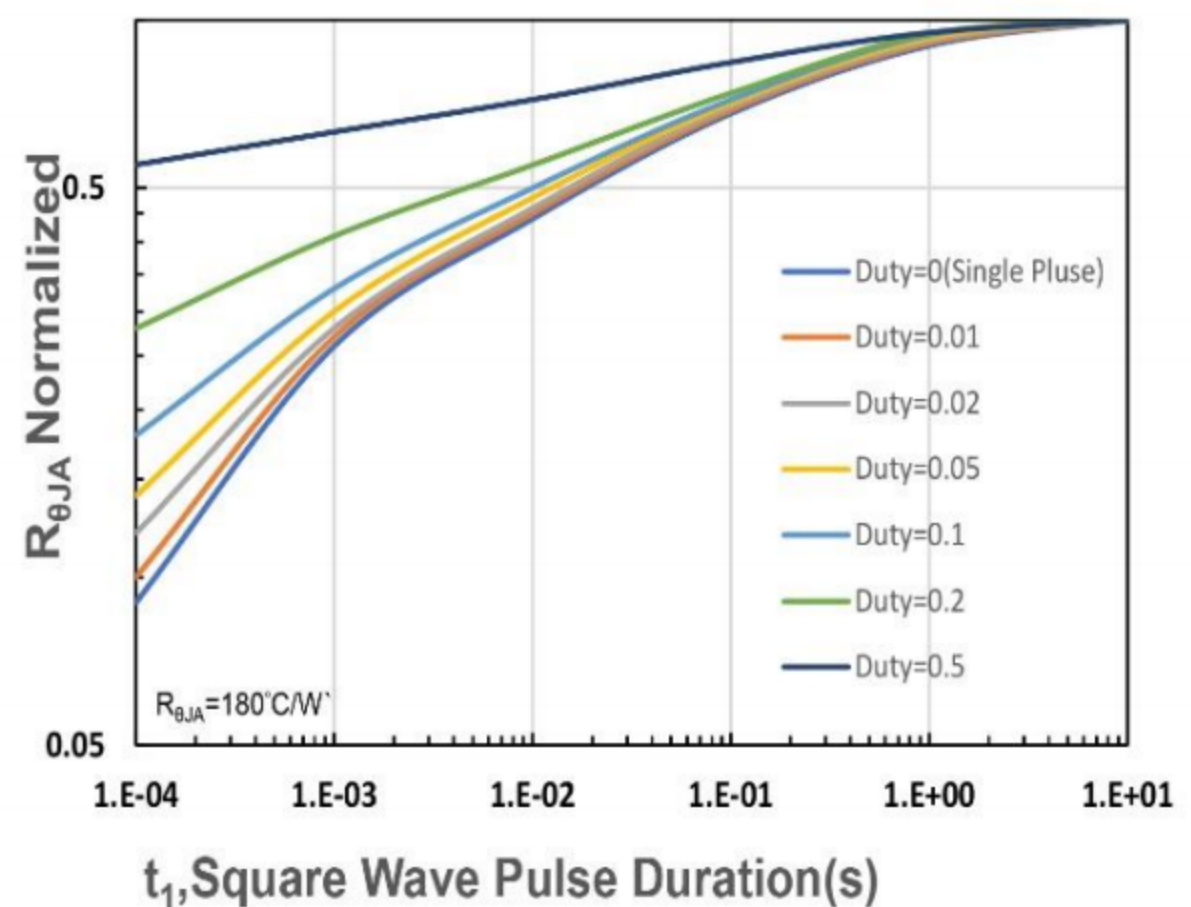
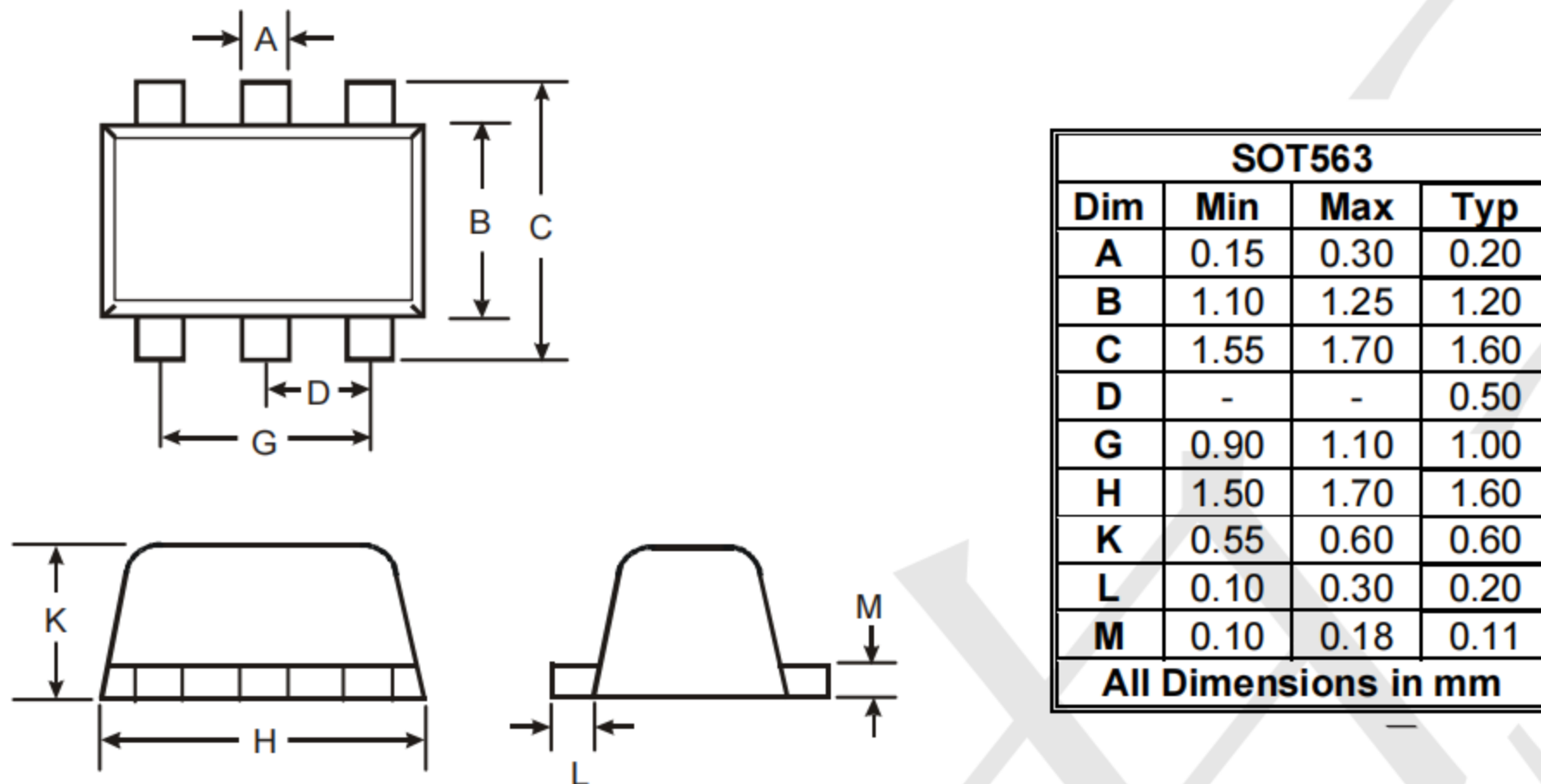
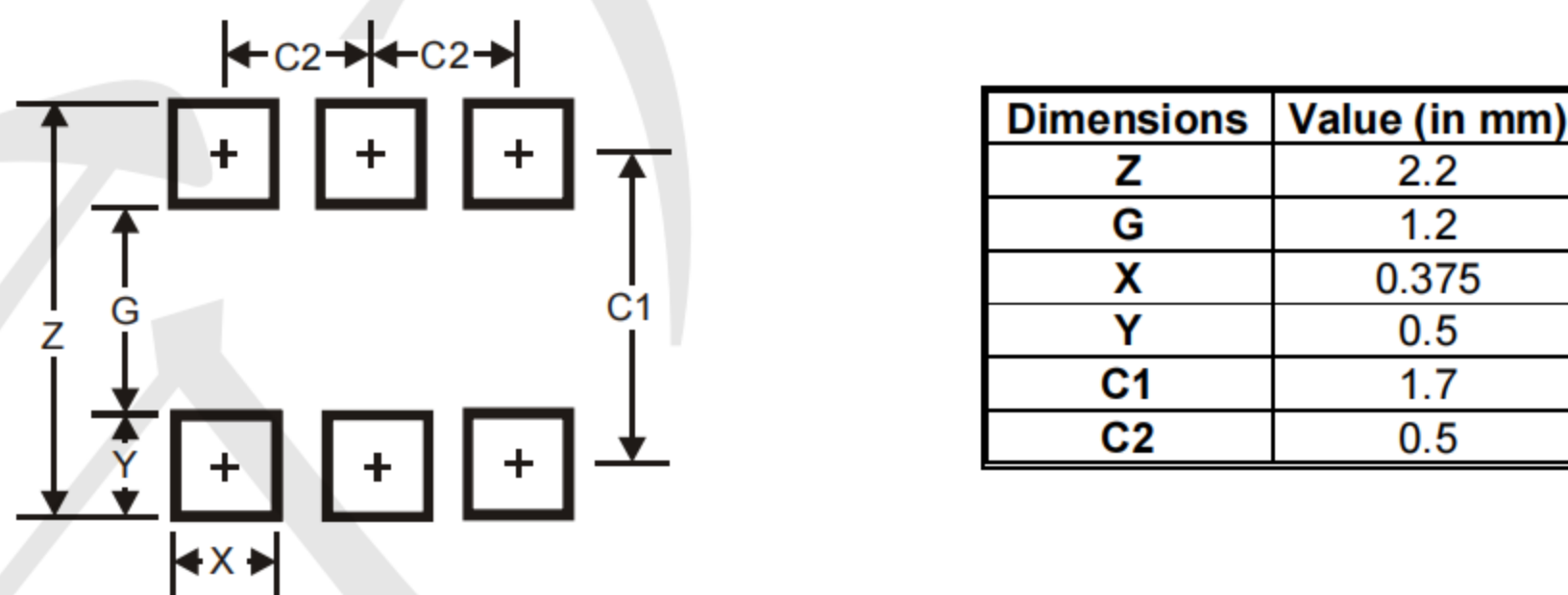


Figure 12. $R_{\theta JA}$ Transient Thermal Impedance

SOT-563 Package Outline Drawing



Suggested Pad Layout



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