

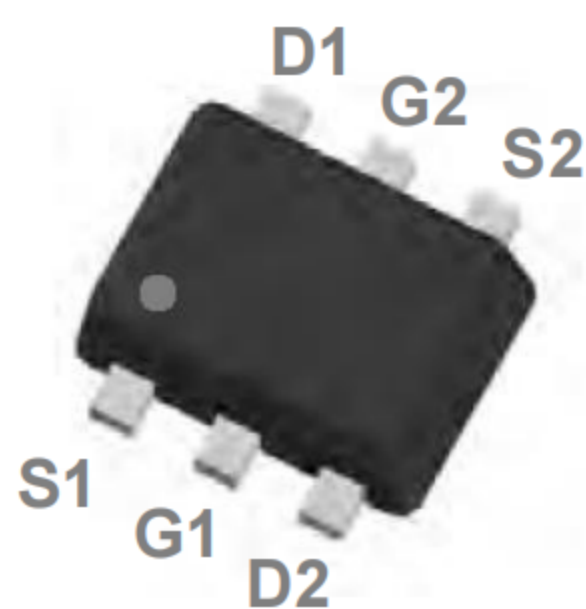
**Features**

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

**Application**

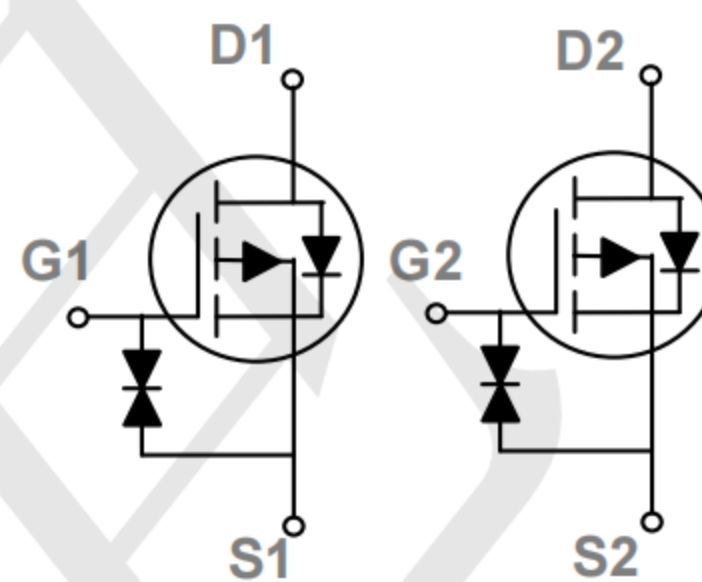
- Notebook
- Load Switch
- Networking
- Hand-held Instruments

**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	$\pm 12$	V
$I_D$	Drain Current – Continuous ( $T_C=25^\circ\text{C}$ )	-1.2	A
$I_{DM}$	Drain Current – Pulsed <sup>1</sup>	-2.1	A
$P_D$	Power Dissipation ( $T_C=25^\circ\text{C}$ )	312	mW
	Power Dissipation – Derate above $25^\circ\text{C}$	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 $25^\circ\text{C}$ , $I_D=-1\text{mA}$	---	-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	$\mu A$
		$V_{DS}=-16V, V_{GS}=0V, T_J=125^\circ\text{C}$	---	---	-10	$\mu A$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$	---	---	$\pm 20$	$\mu A$

**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 <sup>2,3</sup>		---	0.5		$nC$
$Q_{gs}$	Gate-Source Charge <sup>2,3</sup>	$V_{DS}=-10V, V_{GS}=-4.5V, I_D=-1A$	---	0.28		
$Q_{gd}$	Gate-Drain Charge <sup>2,3</sup>		---	0.28		
$T_{d(on)}$	Turn-On Delay Time <sup>2,3</sup>	$V_{DD}=-10V, V_{GS}=-4.5V, R_G=6\Omega, I_D=-1A$	---	0.4		$ns$
$T_r$	Rise Time <sup>2,3</sup>		---	0.06		
$T_{d(off)}$	Turn-Off Delay Time <sup>2,3</sup>		---	0.02		
$T_f$	Fall Time <sup>2,3</sup>		---	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



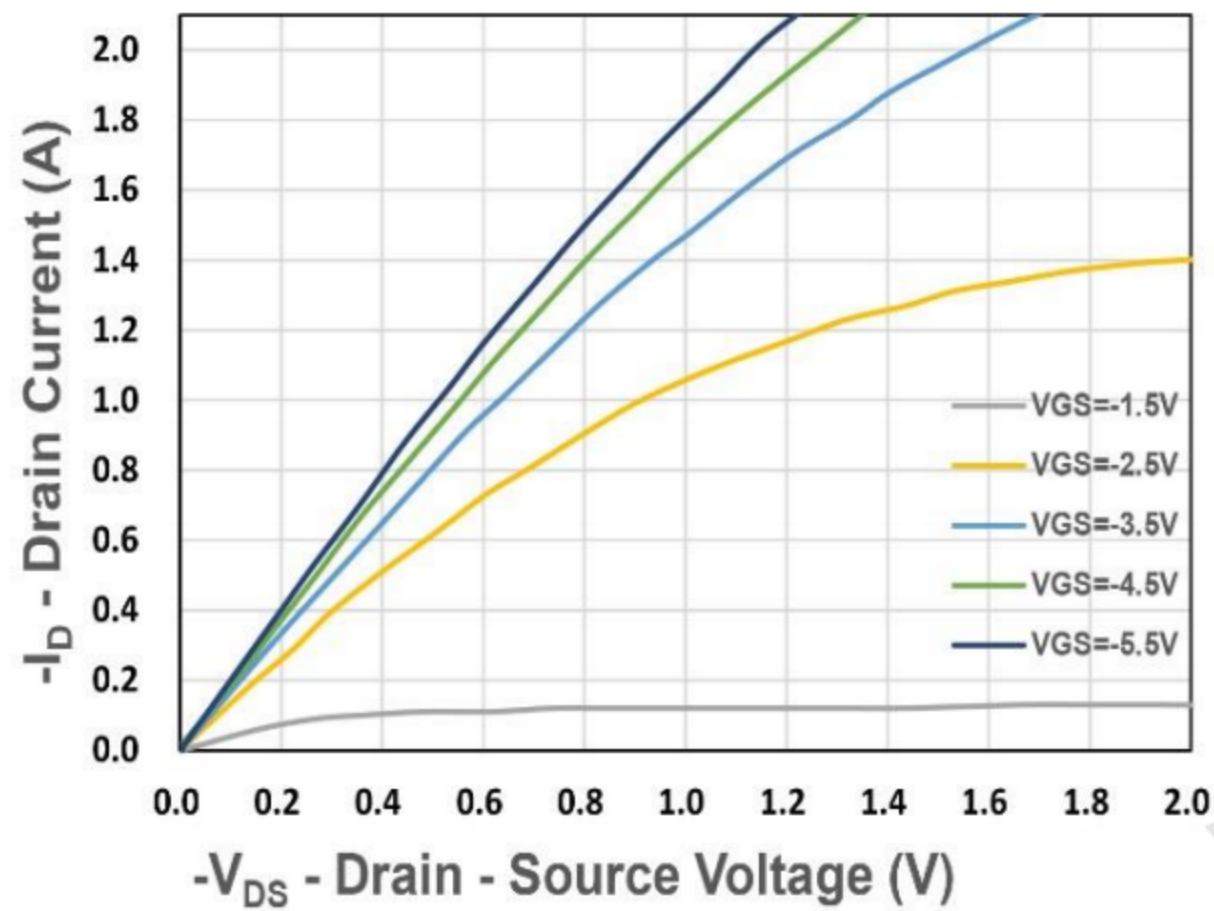


Figure 1. Output Characteristics

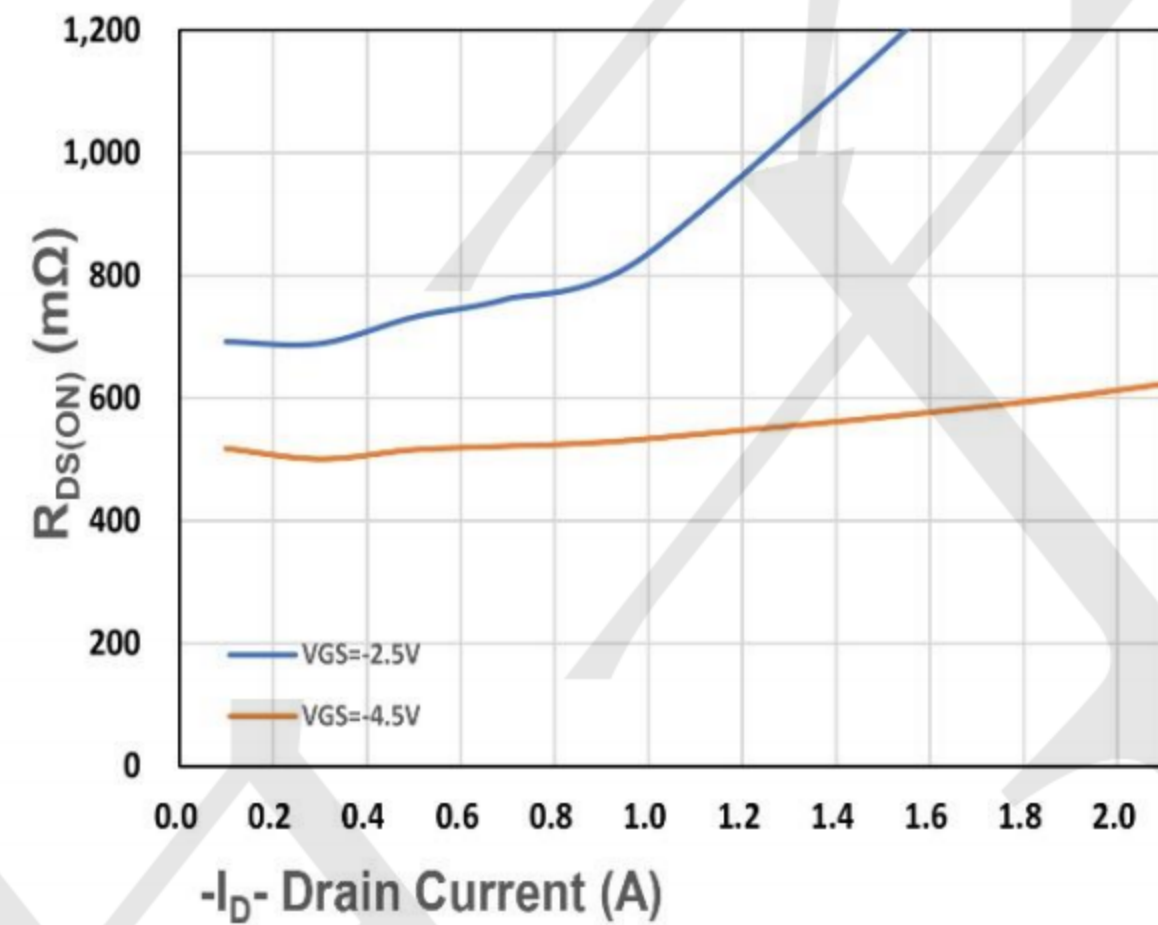


Figure 2. On-Resistance vs.  $I_D$

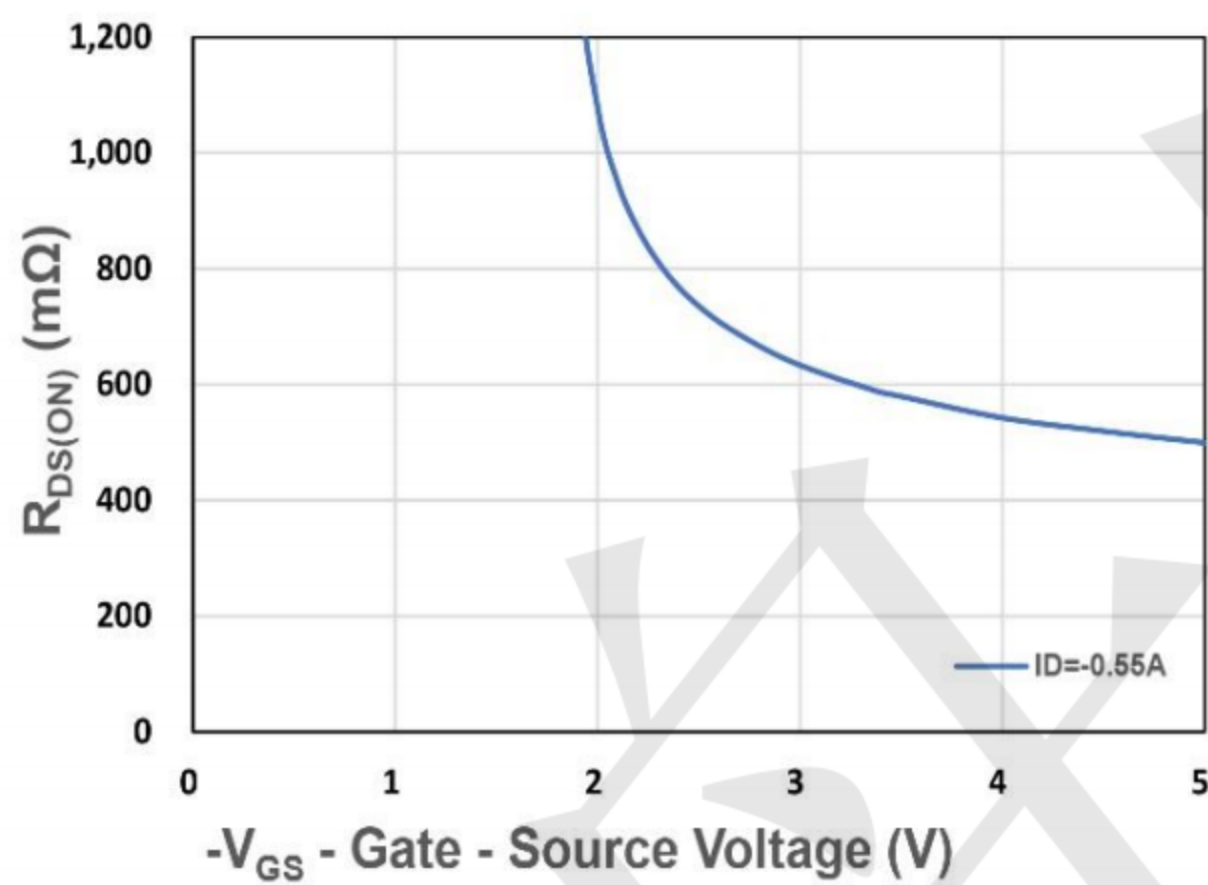


Figure 3. On-Resistance vs.  $V_{GS}$

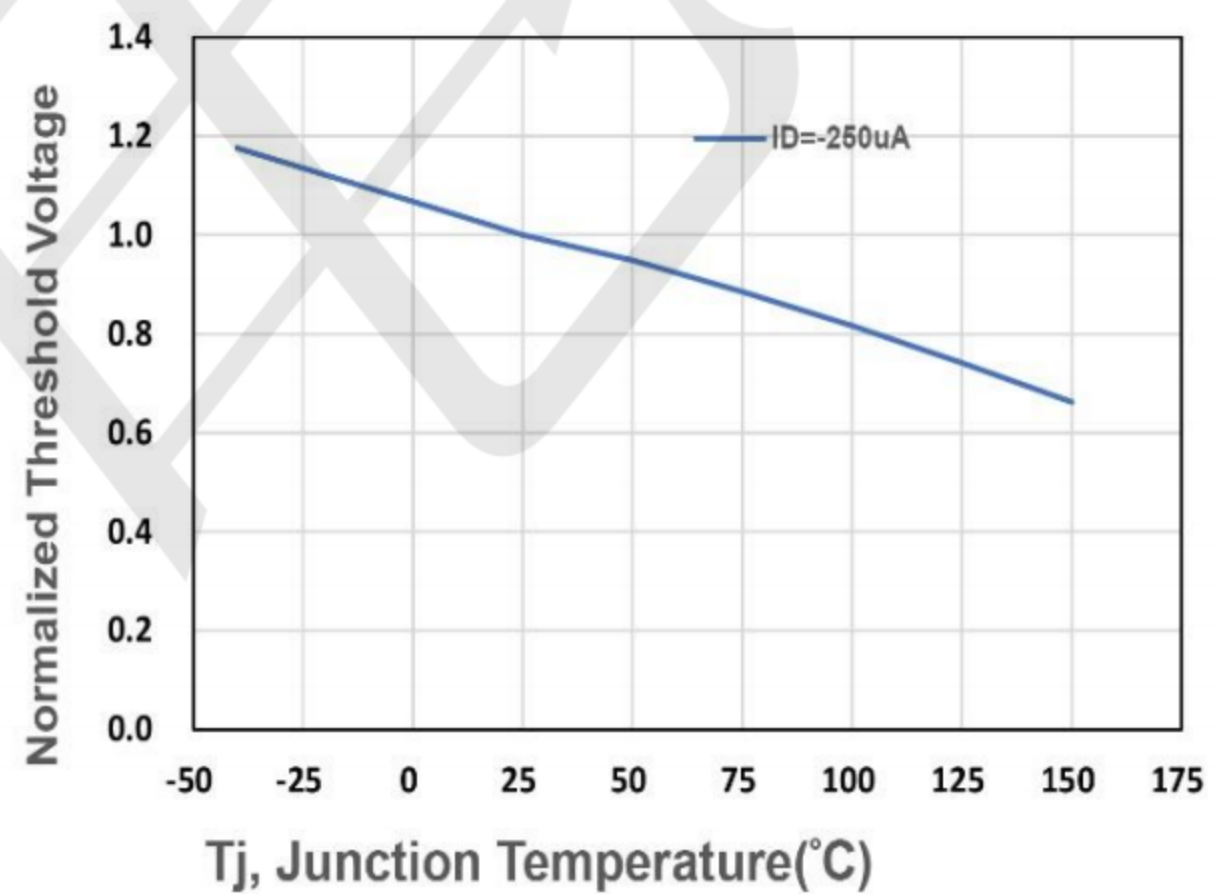


Figure 4. Gate Threshold Voltage

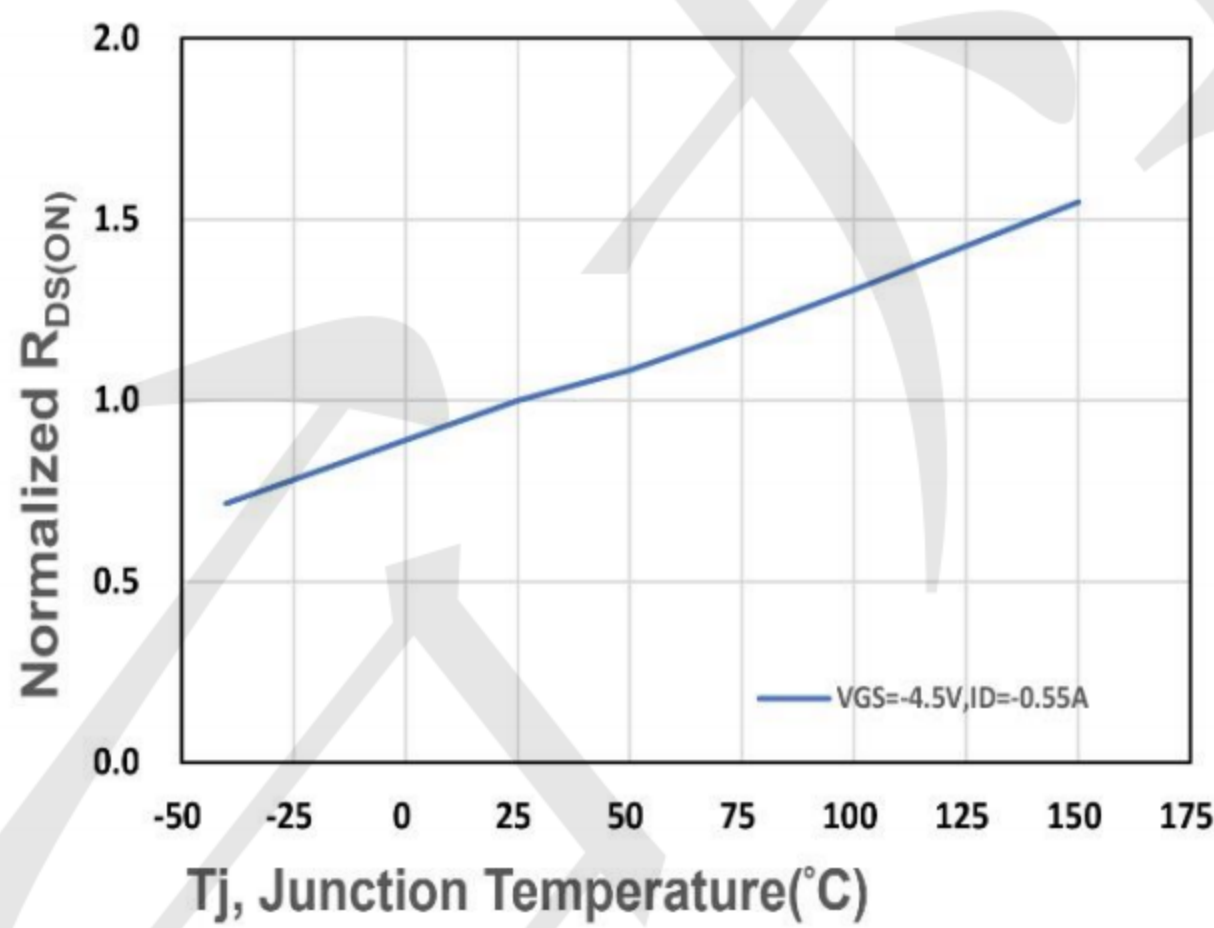


Figure 5. Drain-Source On Resistance

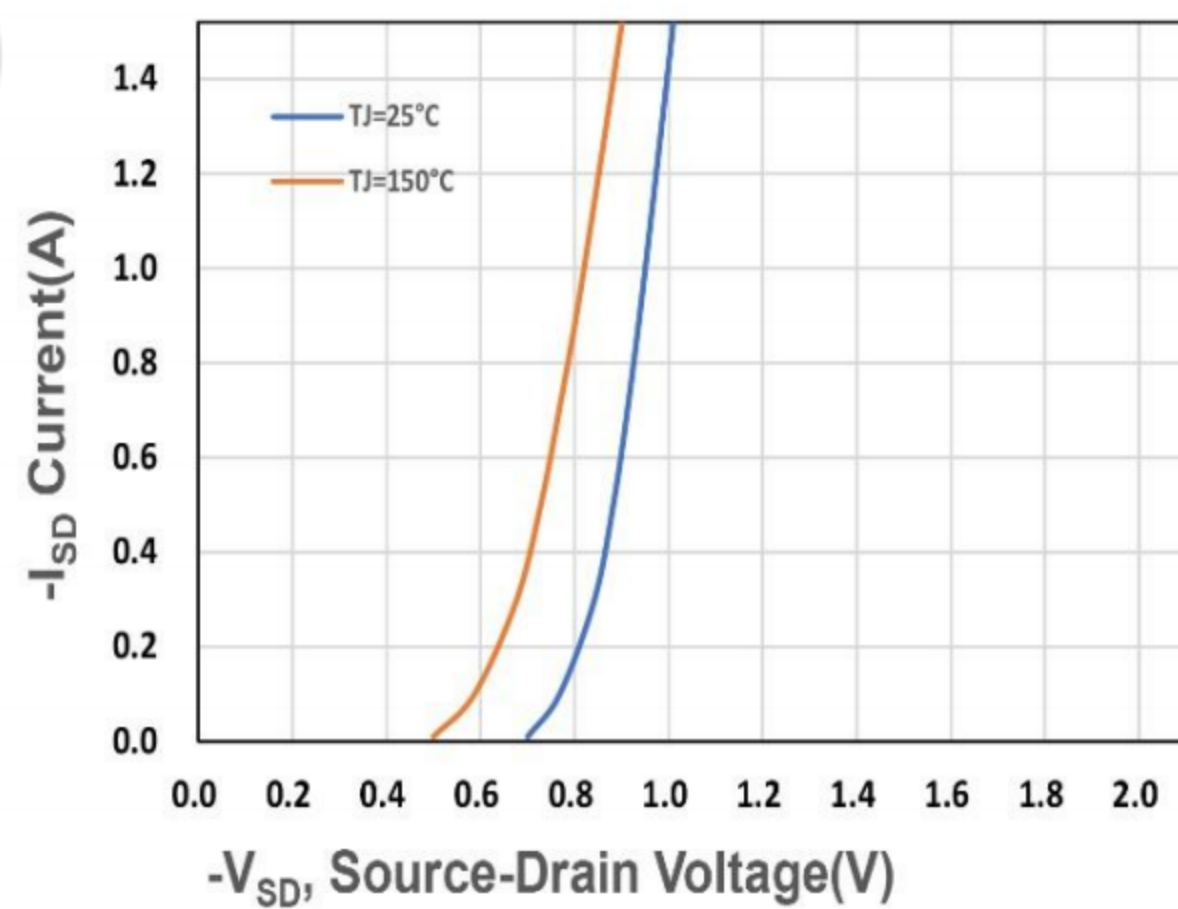


Figure 6. Source-Drain Diode Forward



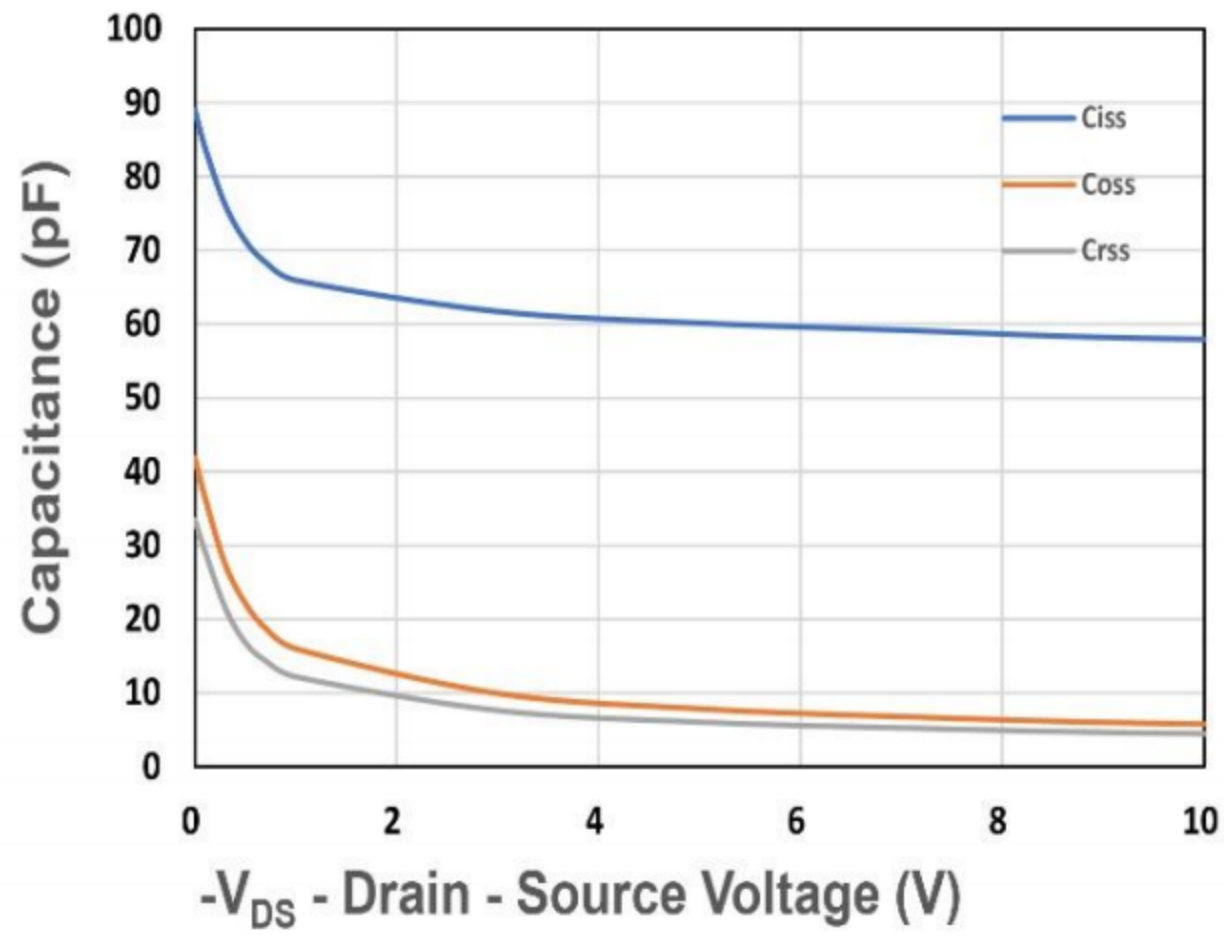


Figure 7. Capacitance

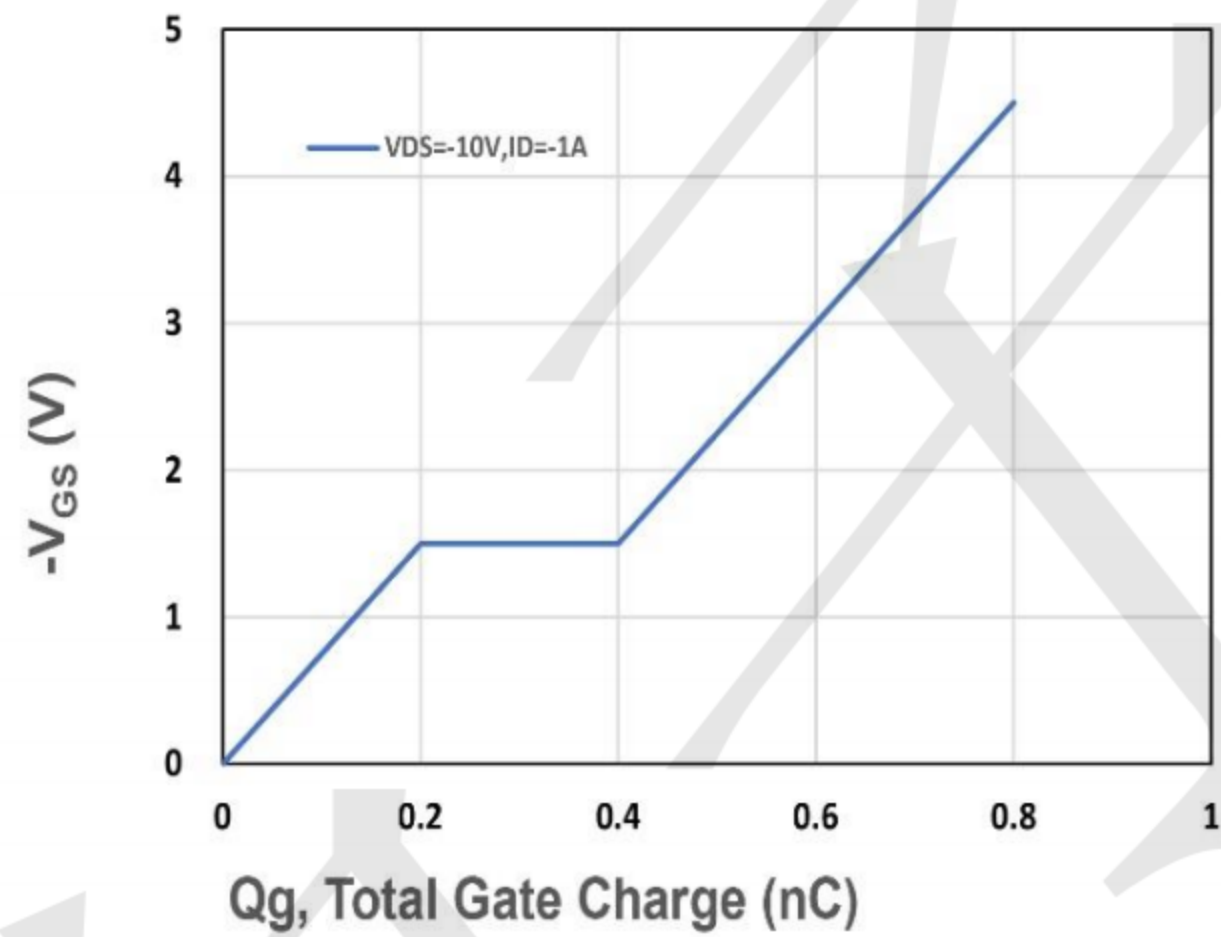


Figure 8. Gate Charge Characteristics

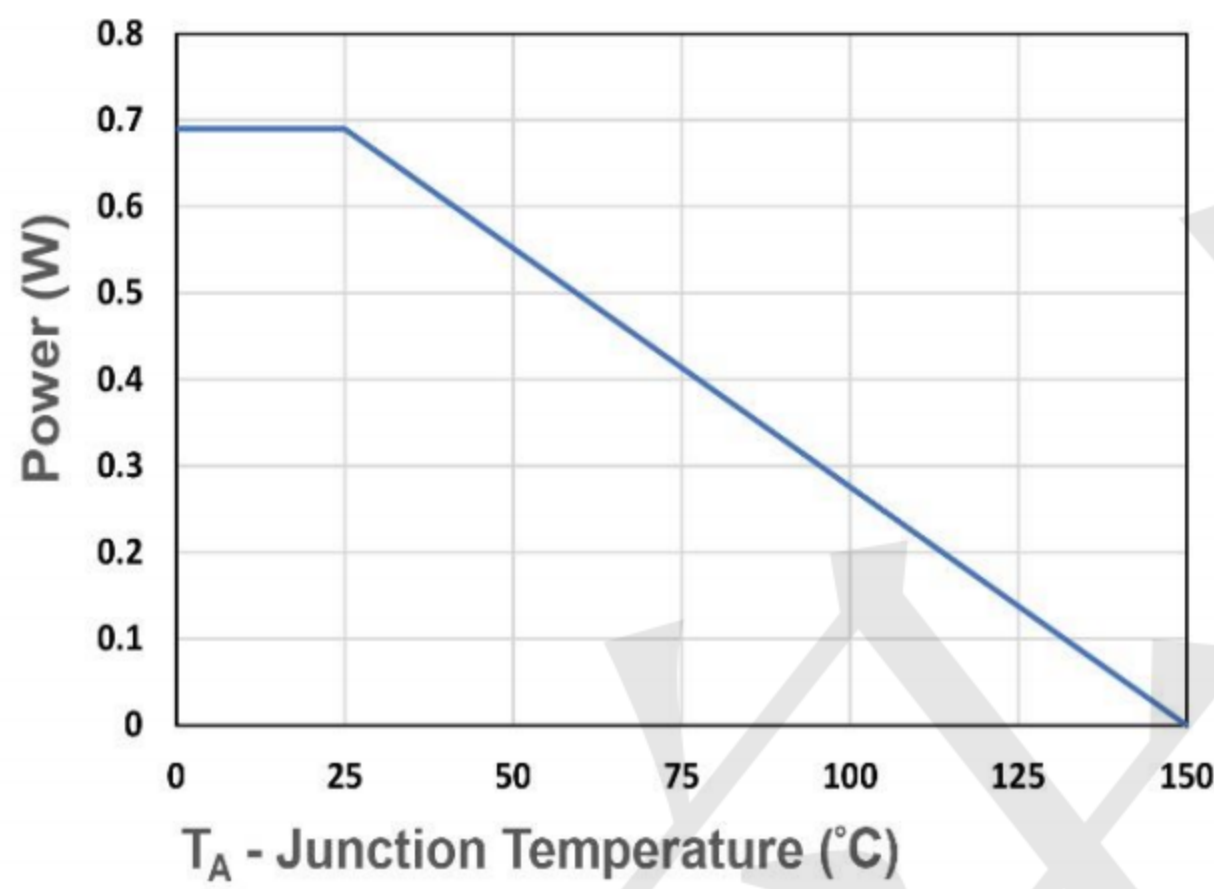


Figure 9. Power Dissipation

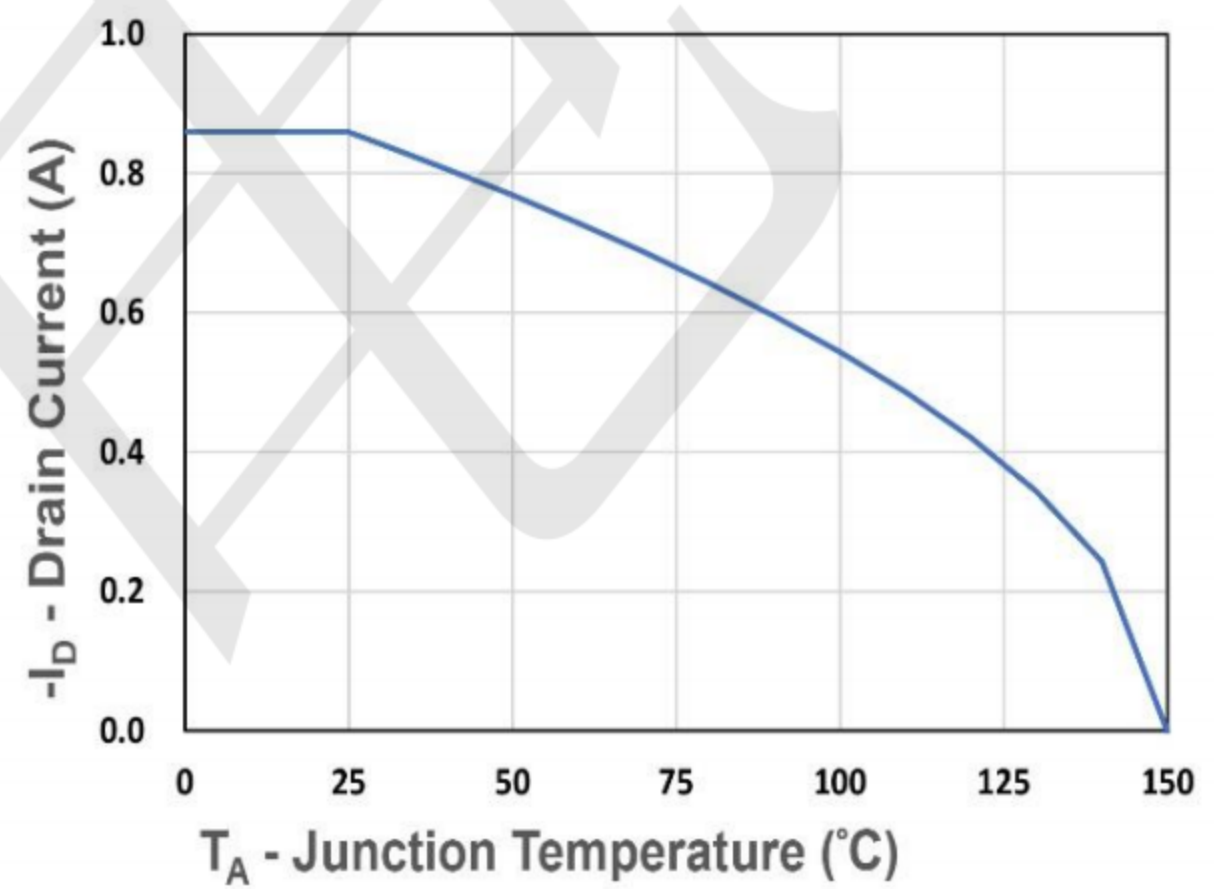


Figure 10. Drain Current

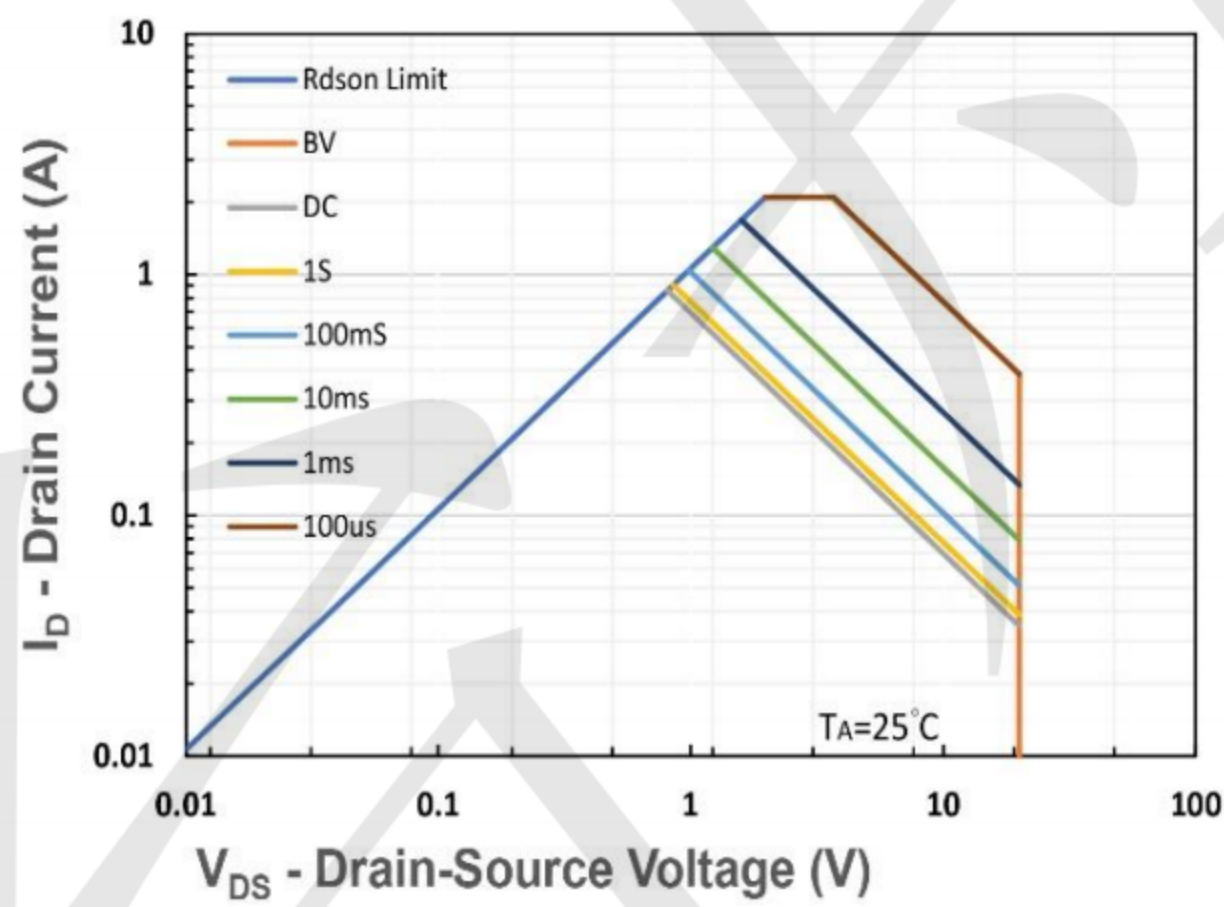


Figure 11. Safe Operating Area

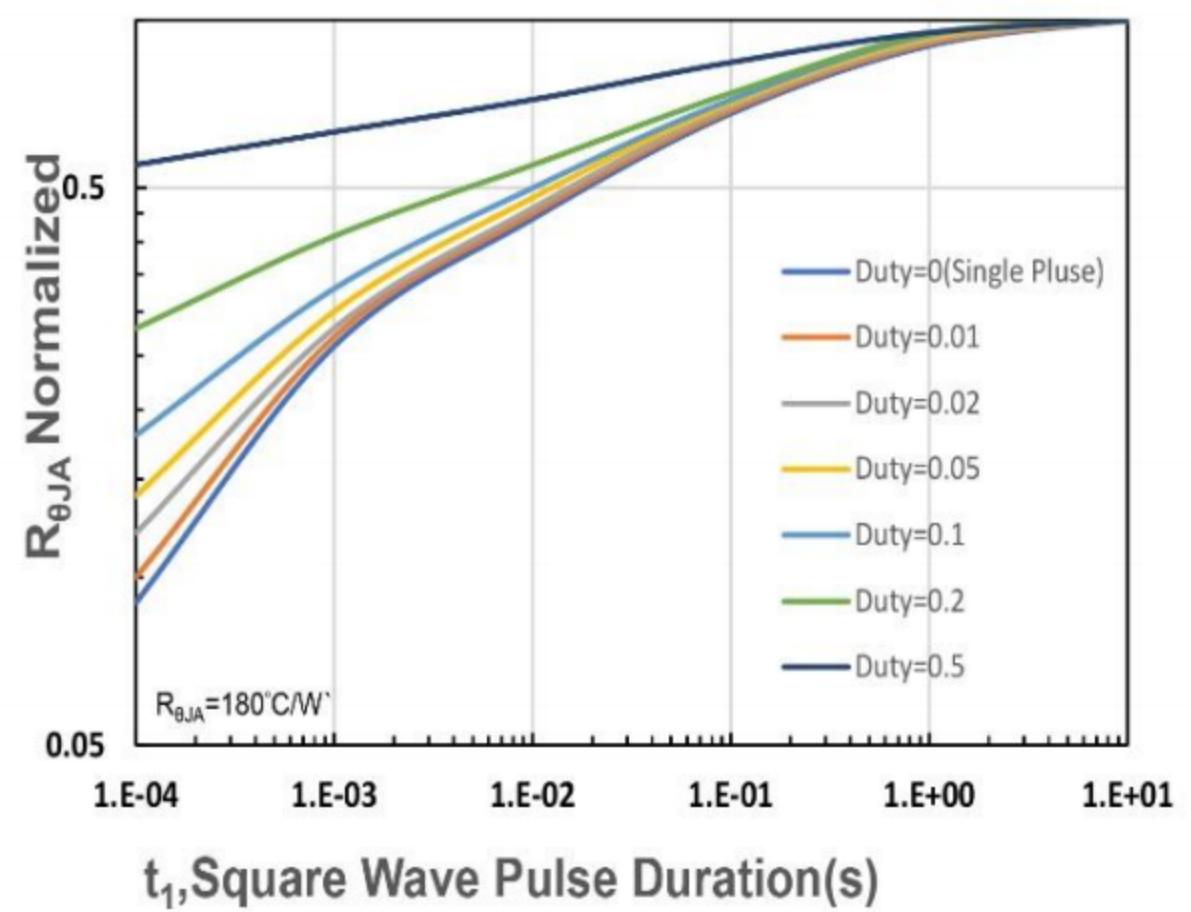
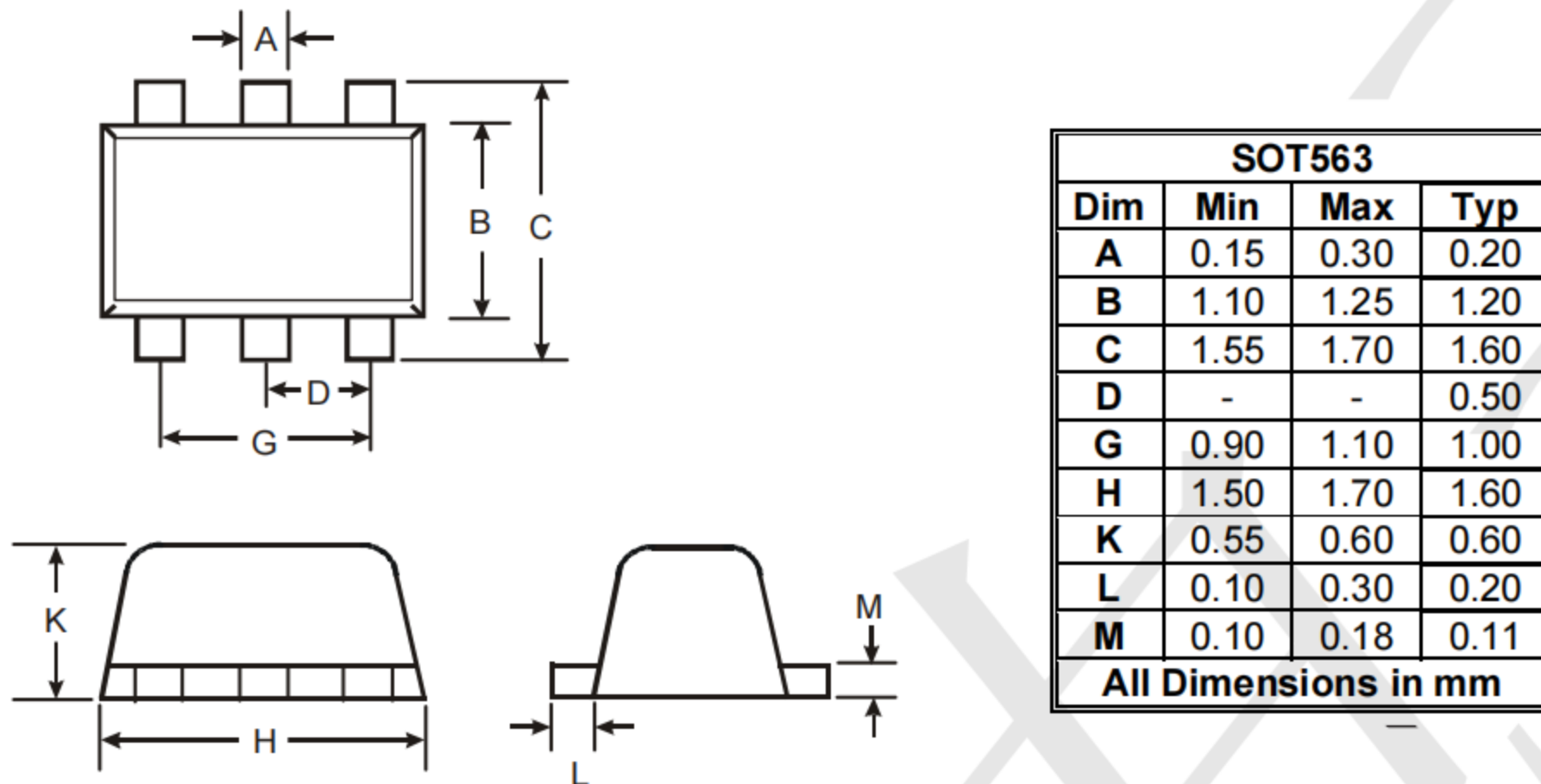
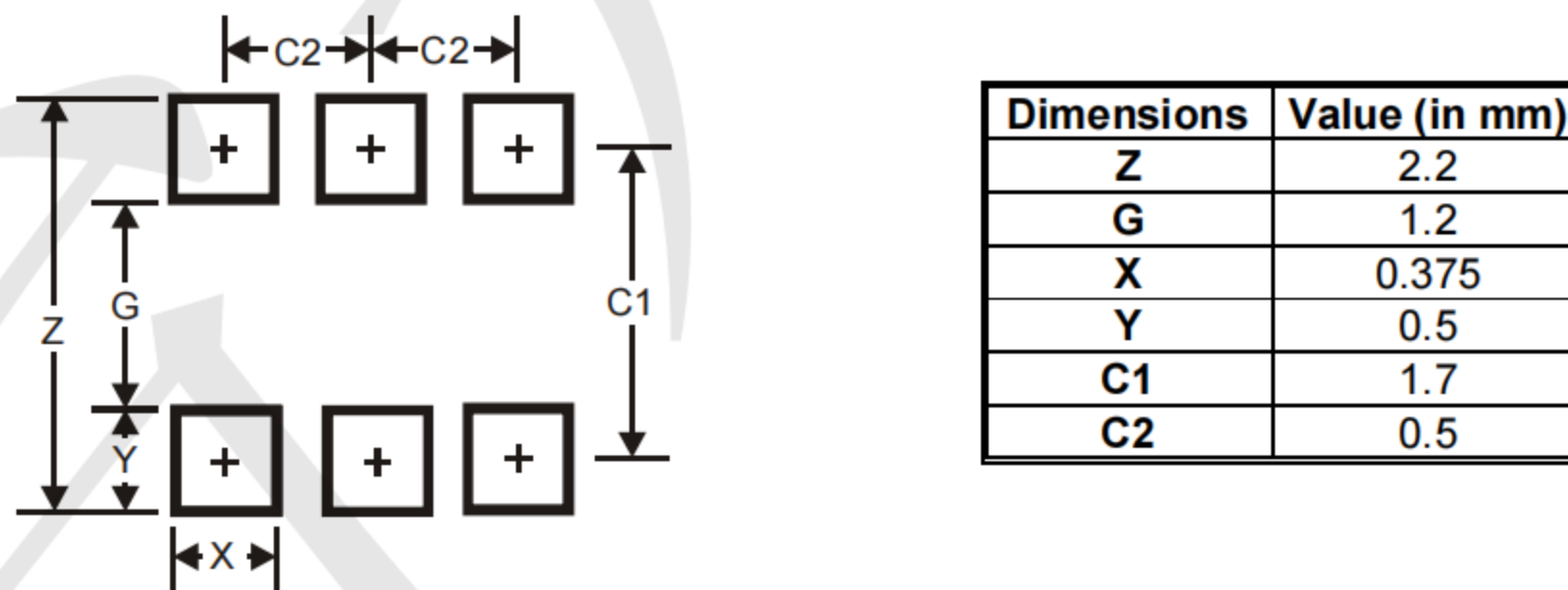


Figure 12.  $R_{\theta JA}$  Transient Thermal Impedance

**SOT-563 Package Outline Drawing**



**Suggested Pad Layout**



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