TPNTZD3158PT1G

20V Dual P-Channel Enhancement Mode MOSFET

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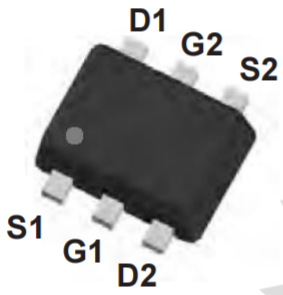
Features

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

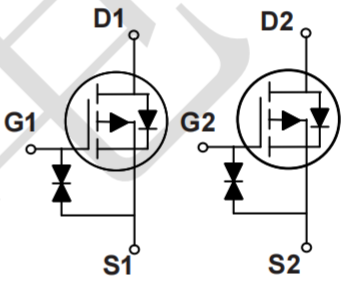
Application

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

Package and Pin Configuration



Circuit diagram



Absolute Maximum Ratings Tc=25℃ 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°C)	-1.2	A
I_{DM}	Drain Current – Pulsed[1]	-2.1	A
P_D	Power Dissipation (T_C=25°C)	312	mW
	Power Dissipation – Derate above 25°C	2.5	mW/°C
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Characteristics

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

Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=-250uA	-20	---	---	V
$\triangle BV_{DSS}/\triangle T_J$	BV_{DSS} Temperature Coefficient	Reference to 25℃ , I_D=-1mA	---	-0.01	---	V/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-20V , V_{GS}=0V , T_J=25℃	---	---	-1	uA
		V_{DS}=-16V , V_{GS}=0V , T_J=125℃	---	---	-10	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±12V , V_{DS}=0V	---	---	±20	uA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=-4.5V , I_D=-0.5A	---	400	600	mΩ
		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 =-250uA	-0.5	-0.75	1.0	V
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	3	---	mV/℃

Dynamic and switching Characteristics

Q_g	Total Gate Charge[2,3]	V_{DS}=--10V , V_{GS}=-4.5V , I_D=-1 A	---	0.5		nC
Q_{gs}	Gate-Source Charge[2,3]		---	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 Ω , 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=1MHz	---	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℃	---	-0.75	-1.1	V

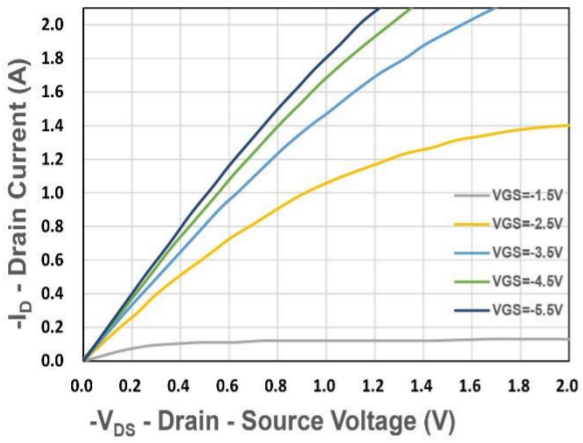


Figure 1. Output Characteristics

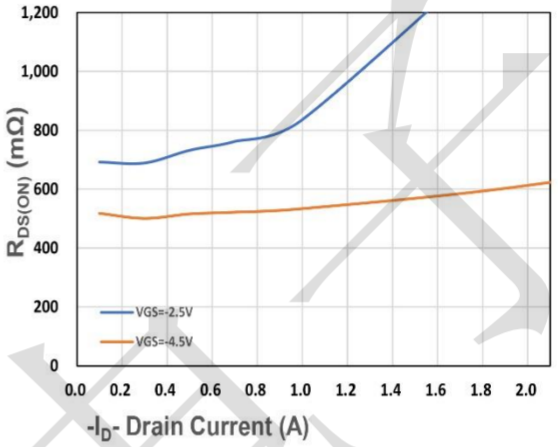


Figure 2. On-Resistance vs. ID

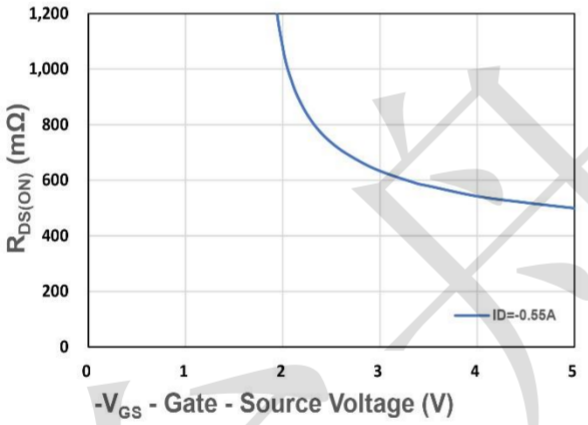


Figure 3. On-Resistance vs. VGS

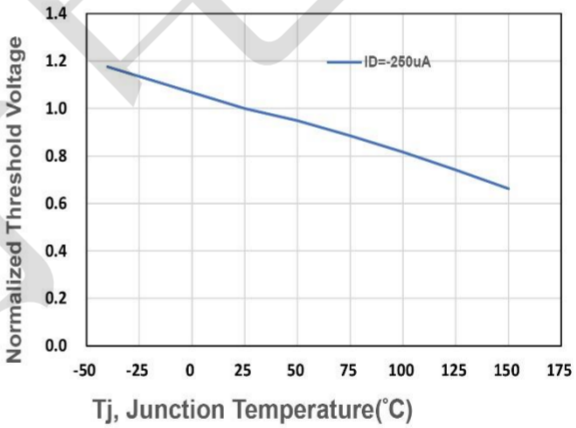


Figure 4. Gate Threshold Voltage

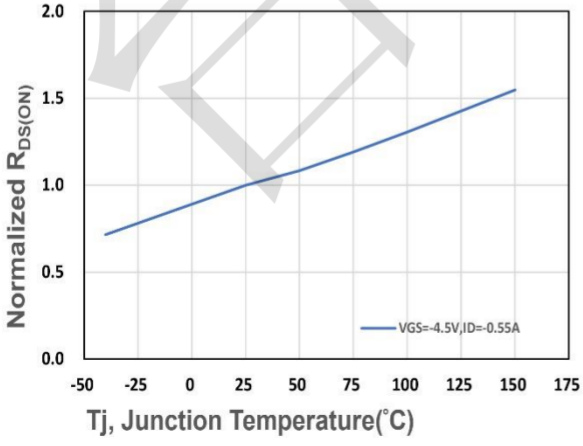


Figure 5. Drain-Source On Resistance

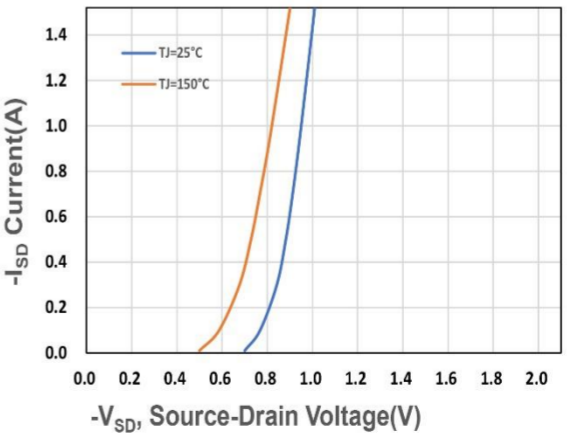


Figure 6. Source-Drain Diode Forward

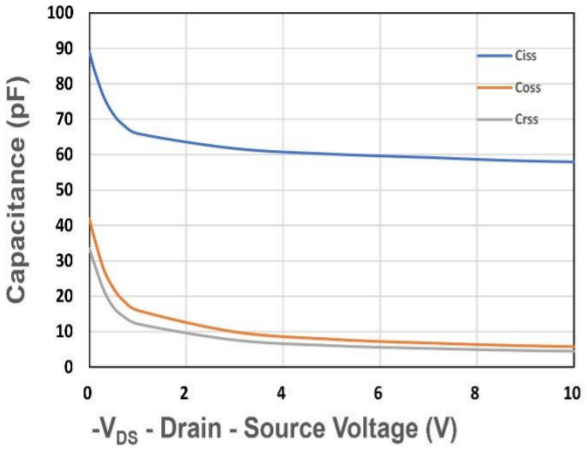


Figure 7. Capacitance

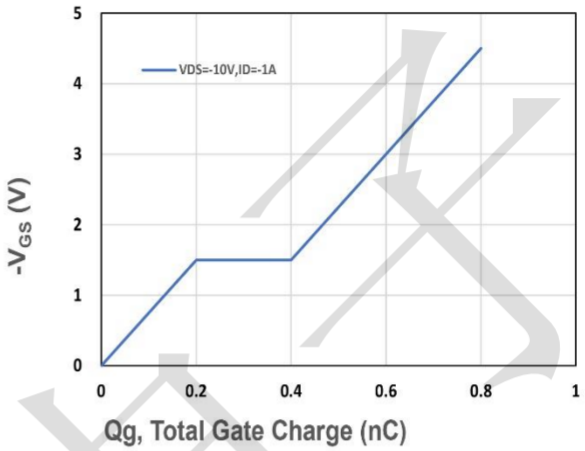


Figure 8. Gate Charge Characteristics

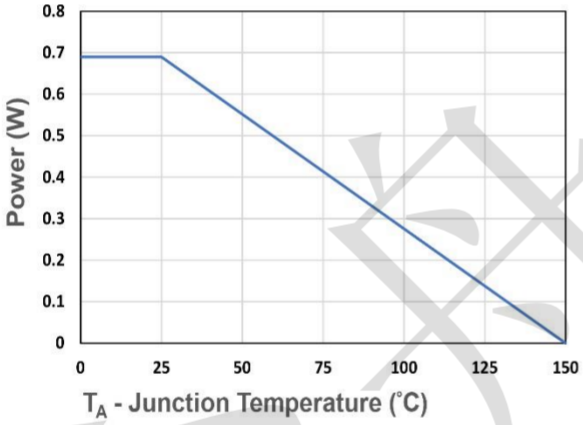


Figure 9. Power Dissipation

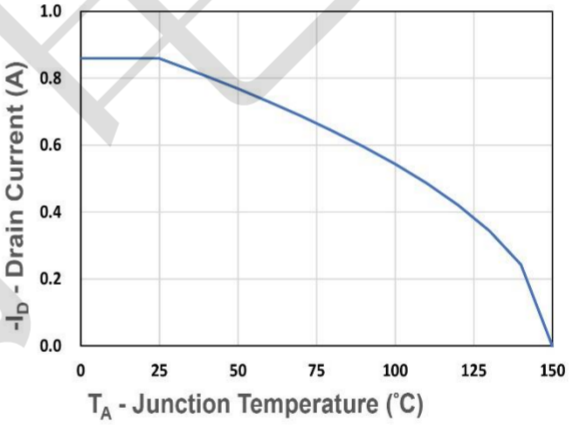


Figure 10. Drain Current

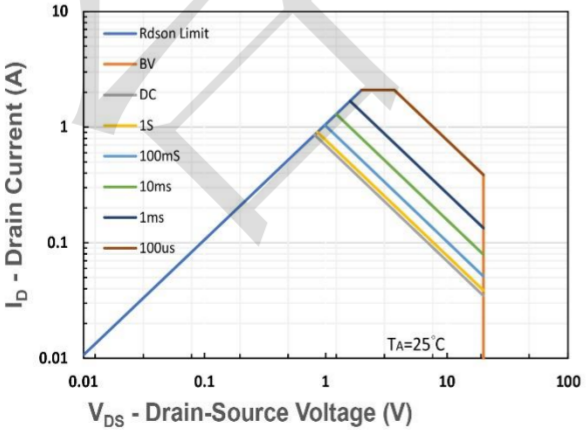


Figure 11. Safe Operating Area

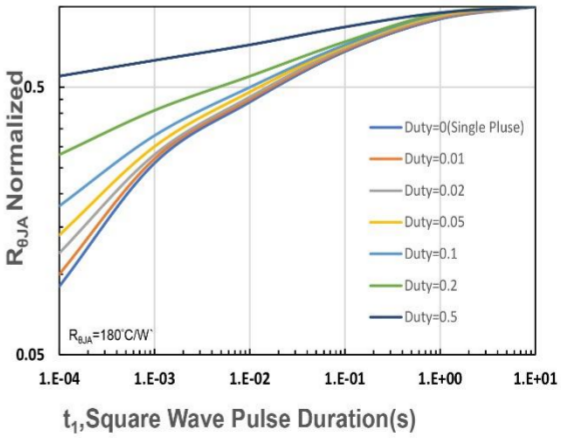
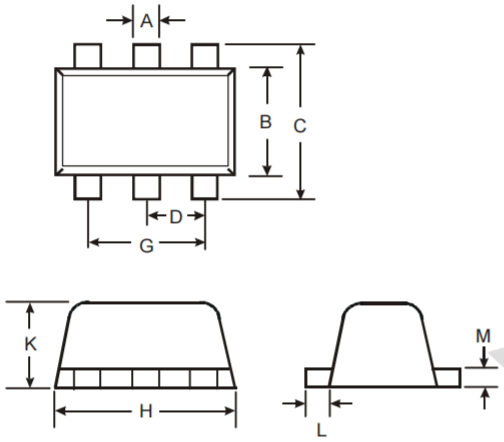


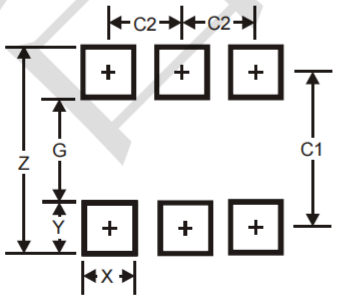
Figure 12. RθJA Transient Thermal Impedance

SOT-563 Package Outli Drawing



SOT563			
Dim	Min	Max	Typ
A	0.15	0.30	0.20
B	1.10	1.25	1.20
C	1.55	1.70	1.60
D	-	-	0.50
G	0.90	1.10	1.00
H	1.50	1.70	1.60
K	0.55	0.60	0.60
L	0.10	0.30	0.20
M	0.10	0.18	0.11
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
Z	2.2
G	1.2
X	0.375
Y	0.5
C1	1.7
C2	0.5