

Description:

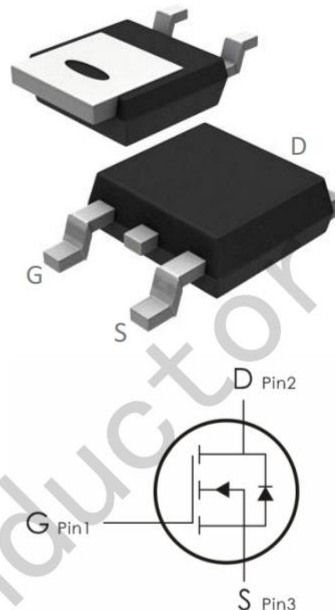
This N-Channel MOSFET uses advanced SGT technology and

design to provide excellent $R_{DS(on)}$ with low gate charge.

It can be used in a wide variety of applications.

Features:

- 1) $V_{DS}=60V, I_D=68A, R_{DS(on)} < 10m\Omega @ V_{GS}=10V$
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra $R_{DS(on)}$.
- 5) Excellent package for good heat dissipation.



Absolute Maximum Ratings: ($T_C=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current- $T_C=25^\circ C^1$	68	A
	Continuous Drain Current- $T_C=100^\circ C$	---	
	Pulsed Drain Current ²	204	
E_{AS}	Single Pulse Avalanche Energy ⁴	91	mJ
P_D	Power Dissipation, $T_C=25^\circ C$	81	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ C$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	1.54	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient ⁵	62	

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	60	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =60V	---	---	1	μ A
I _{GSS}	Gate-Source Leakage Current	V _{GS} =± 20V, V _{DS} =0A	---	---	± 100	nA
On Characteristics						
V _{GS(th)}	GATE-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250 μ A	1	---	2.5	V
R _{DS(ON)}	Drain-Source On Resistance	V _{GS} =10V, I _D =20A	---	7.5	10	m Ω
		V _{GS} =4.5V, I _D =10A	---	10	13	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =50V, V _{GS} =0V, f=1MHz	---	1204	---	pF
C _{oss}	Output Capacitance		---	194.1	---	
C _{rss}	Reverse Transfer Capacitance		---	9.9	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DD} =50V, I _D =25A, V _{GS} =10V, R _{GEN} =3Ω	---	23.9	---	ns
t _r	Rise Time		---	4.6	---	ns
t _{d(off)}	Turn-Off Delay Time		---	37.8	---	ns
t _f	Fall Time		---	6.4	---	ns
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =50V, I _D =25A	---	17.9	---	nC
Q _{gs}	Gate-Source Charge		---	3.8	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	4.2	---	nC
Drain-Source Diode Characteristics						
V _{SD}	Source-Drain Diode Forward Voltage	V _{GS} =0V, I _S =20A	---	---	1.3	V
I _S	Continuous Source Current	V _{GS} <V _{th}		---	68	A

trr	Reverse Recovery Time	$I_S=25\text{ A}$, $di/dt=100\text{ A}/\mu\text{s}$	36.3	---	Ns
qrr	Reverse Recovery Charge		1.4	---	nc

Notes:

- 1) Calculated continuous current based on maximum allowable junction temperature.
- 2) Repetitive rating; pulse width limited by max. junction temperature.
- 3) Pd is based on max. junction temperature, using junction-case thermal resistance.
- 4) $V_{DD}=30\text{ V}$, $R_G=50\ \Omega$, $L=0.3\text{ mH}$, starting $T_J=25\text{ }^\circ\text{C}$.
- 5) The 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 $T_a=25\text{ }^\circ\text{C}$.

Typical Characteristics: ($T_C=25\text{ }^\circ\text{C}$ unless otherwise noted)

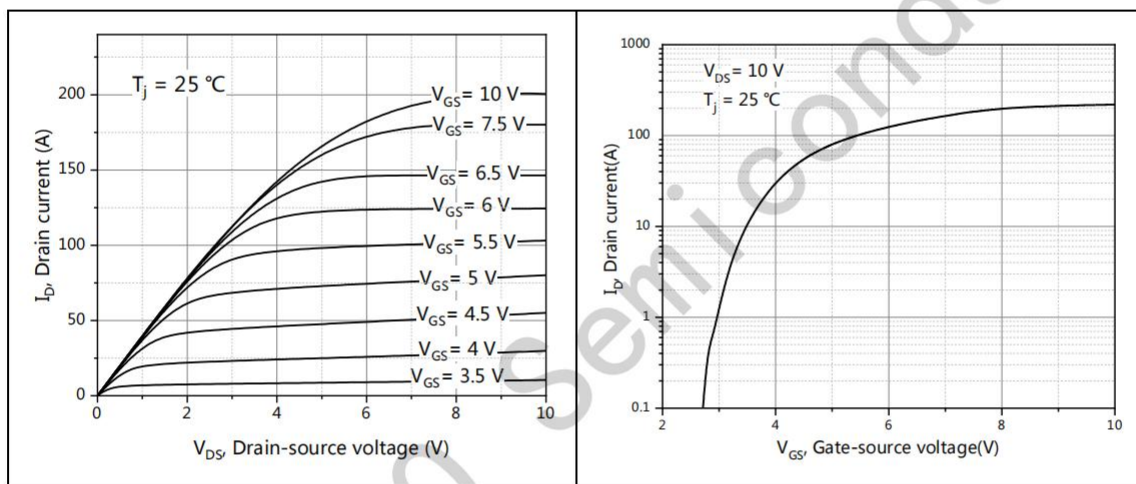


Figure 1, Typ. output characteristics

Figure 2, Typ. transfer characteristics

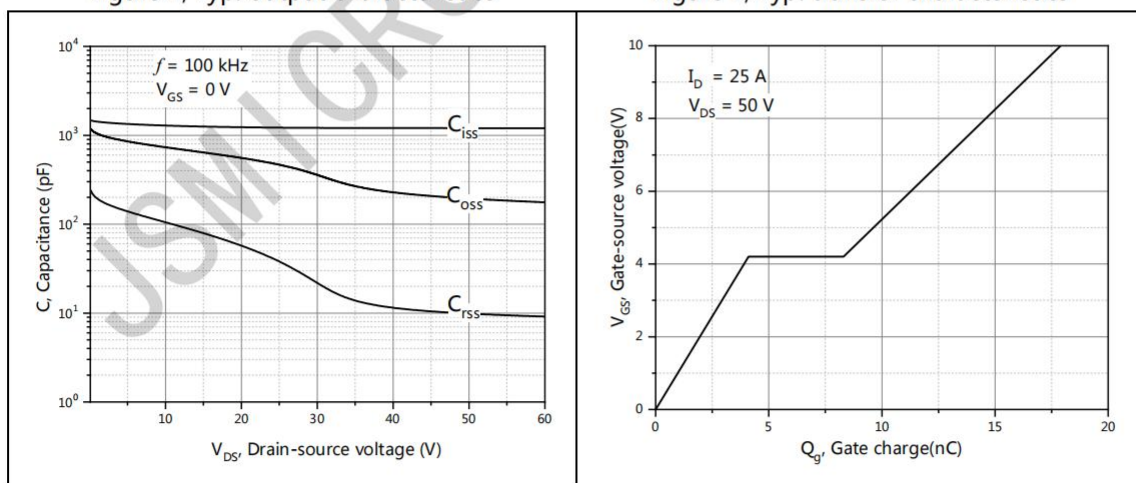


Figure 3, Typ. capacitances

Figure 4, Typ. gate charge

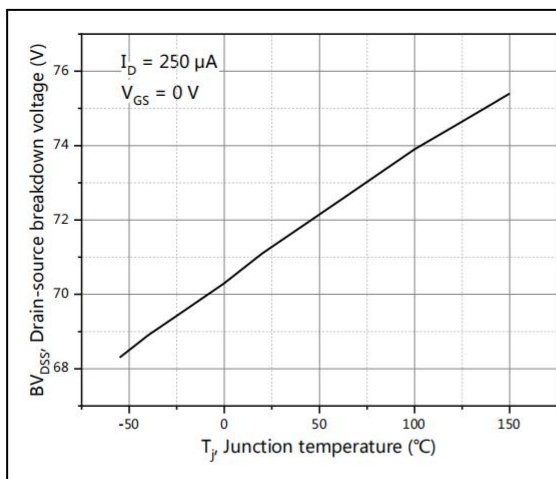


Figure 5, Drain-source breakdown voltage

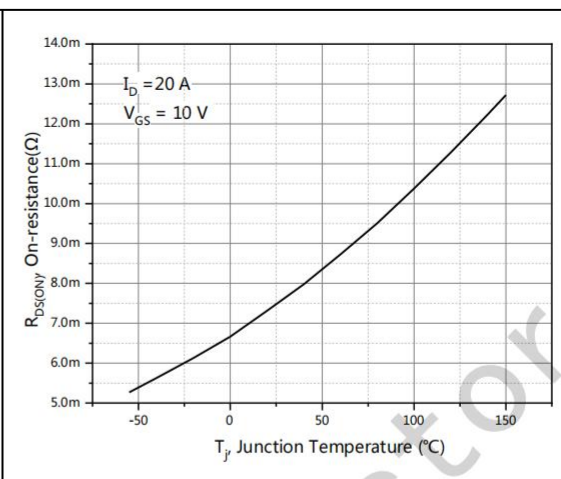


Figure 6, Drain-source on-state resistance

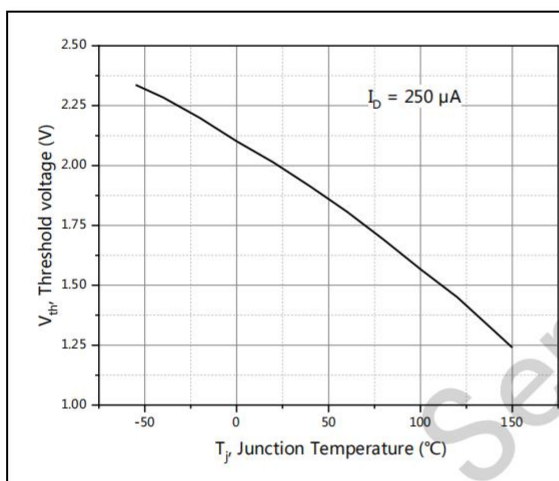


Figure 7, Threshold voltage

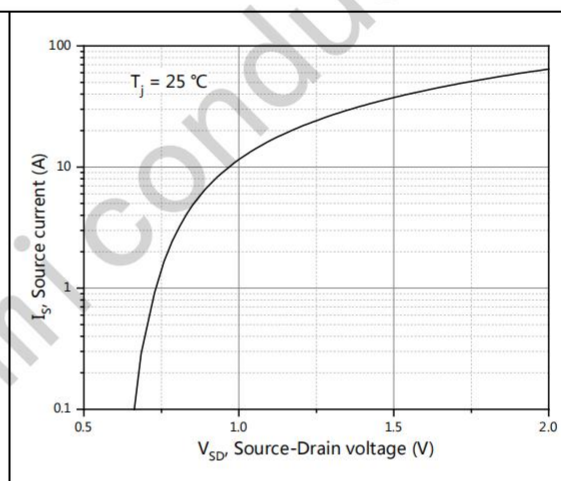


Figure 8, Forward characteristic of body diode

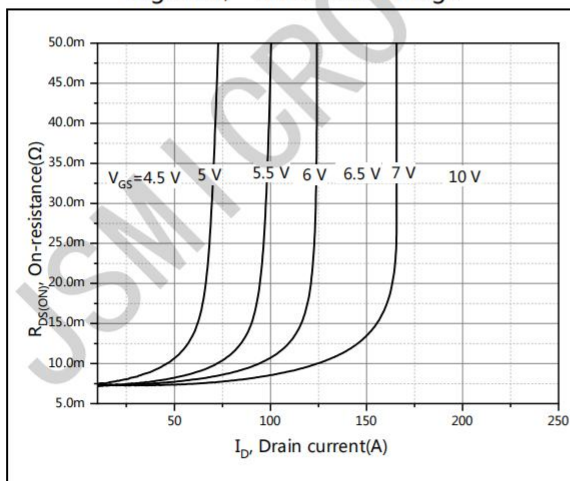


Figure 9, Drain-source on-state resistance

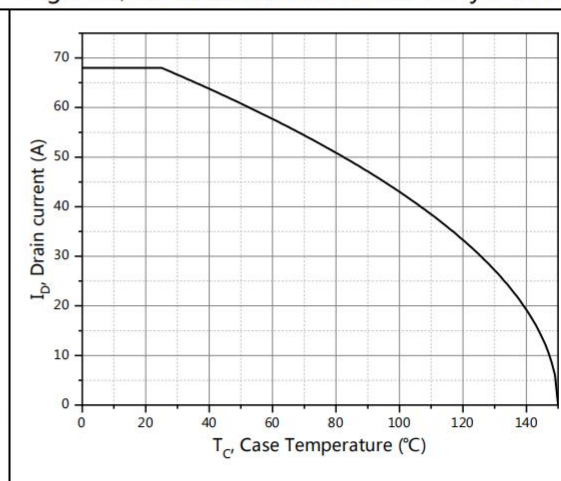


Figure 10, Drain current

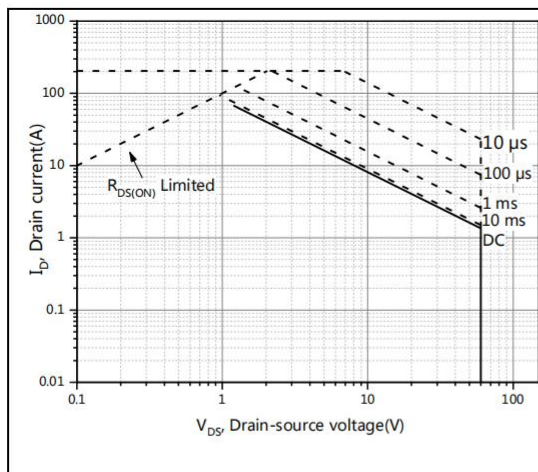


Figure 11, Safe operation area $T_C = 25^\circ\text{C}$

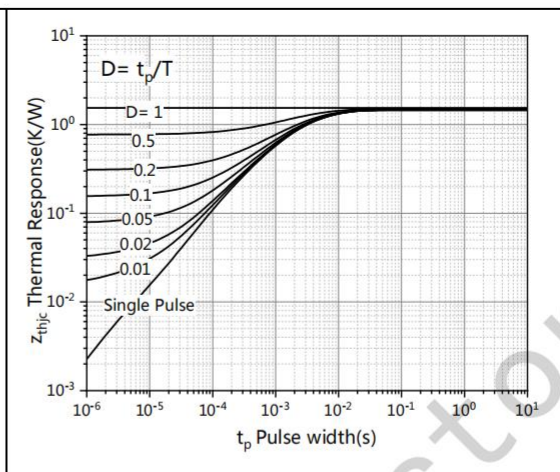
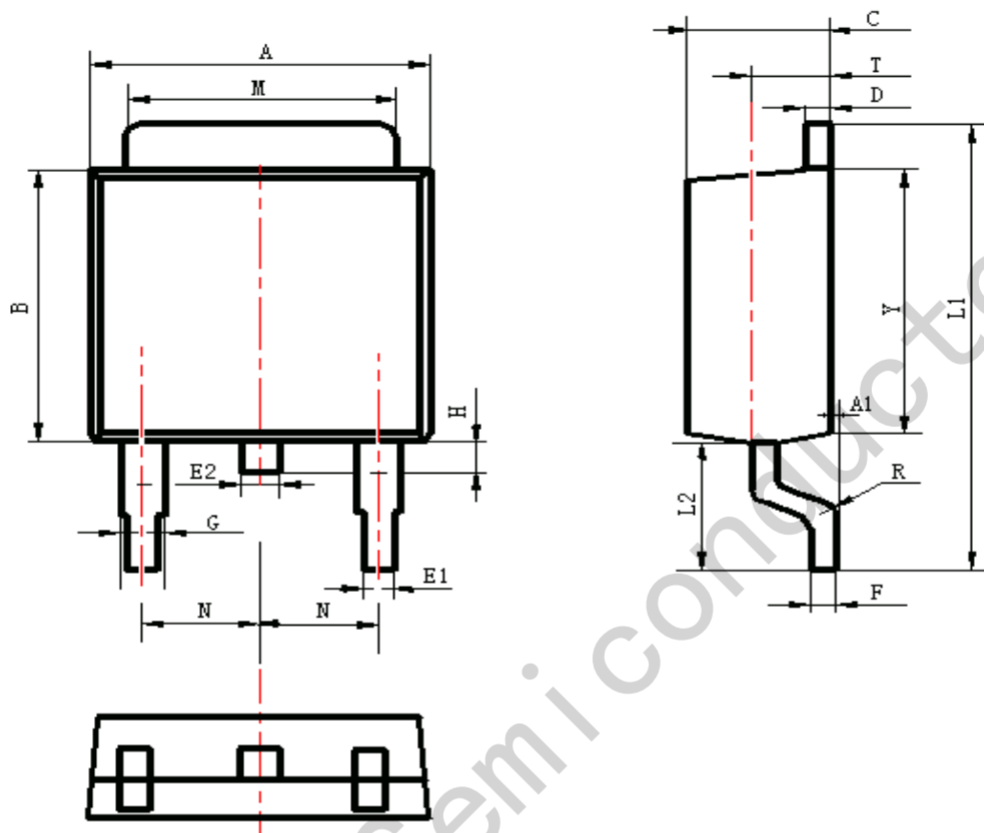


Figure 12, Max. transient thermal impedance

Package Information

TO-252



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	6.30	6.90	0.248	0.272
A1	0.00	0.16	0.000	0.006
B	5.70	6.30	0.224	0.248
C	2.10	2.50	0.083	0.098
D	0.30	0.70	0.012	0.028
E1	0.60	0.90	0.024	0.035
E2	0.70	1.00	0.028	0.039
F	0.30	0.60	0.012	0.024
G	0.70	1.20	0.028	0.047
L1	9.60	10.50	0.378	0.413
L2	2.70	3.10	0.106	0.122
H	0.40	1.00	0.016	0.039
M	5.10	5.50	0.201	0.217
N	2.09	2.49	0.082	0.098
R	0.30		0.012	
T	1.40	1.60	0.055	0.063
Y	5.10	6.30	0.201	0.248