

Description:

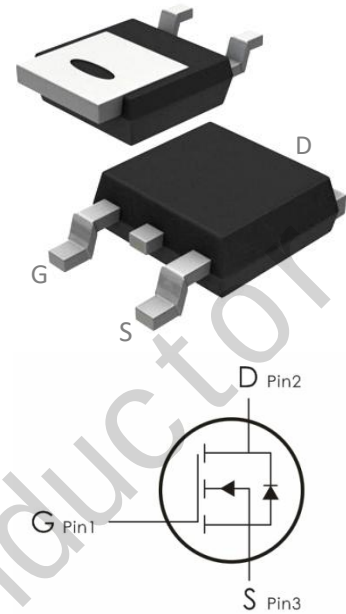
This N-Channel MOSFET uses advanced SGT technology and

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

It can be used in a wide variety of applications.

Features:

- 1) $V_{DS}=100V, I_D=55A, R_{DS(on)} < 12m\Omega @ V_{GS}=10V$
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra low $R_{DS(on)}$.
- 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	100	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current ¹⁾	55	A
$I_{D, pulse}$	Pulsed drain current ²⁾	165	A
I_S	Continuous diode forward current ¹⁾	55	A
$I_{S, pulse}$	Diode pulsed current ²⁾	165	A
P_D	Continuous-Source Current ³⁾	115	W
E_{AS}	Single pulsed avalanche energy ⁵⁾	14	mJ
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	1.09	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient ⁴⁾	62	$^\circ C/W$

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Sourctce Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	100	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =100V	---	---	1	μ A
I _{GSS}	Gate-Source Leakage Current	V _{GS} =± 20V, V _{DS} =0A	---	---	± 100	nA
R _G	Gate resistance	f=1 MHz, Open drain	---	---	3	Ω
On Characteristics						
V _{GS(th)}	GATE-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250 μ A	1.5	---	2.5	V
R _{DS(on)}	Drain-Source On Resistance	V _{GS} =10V, I _D =30A	---	10	12	m Ω
		V _{GS} =4.5V, I _D =12A	---	12	15	m Ω
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1MHz	---	1550	---	pF
C _{oss}	Output Capacitance		---	680	---	
C _{rss}	Reverse Transfer Capacitance		---	65	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DS} =50V, I _D =25A, V _{GS} =10V, R _G =2Ω	---	16	--	ns
t _r	Rise Time		---	4	---	ns
t _{d(off)}	Turn-Off Delay Time		---	35.6	---	ns
t _f	Fall Time		---	5.8	---	ns
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =50V, I _D =25A	---	24.6	---	nC
Q _{gs}	Gate-Source Charge		---	4.1	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	5.8	---	nC
V _{plateau}	Gate plateau voltage		---	3.1	---	V

Drain-Source Diode Characteristics						
V_{SD}	Source-Drain Diode Forward Voltage	V _{GS} =0V, I _S =30A	---	---	1.3	V
t_{rr}	Reverse Recovery Time	V _R =50V, I _S =25 A dI _{SD} /dt = 100 A/ μ s	---	53.2	---	Ns
q_{rr}	Reverse Recovery Charge			52.5	---	Nc
I_{rrm}	Peak reverse recovery current			1.7	---	A

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) The value of R_{θJA} 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 °C.
- 5) V_{DD}=50 V, V_{GS}=10 V, L=0.3 mH, starting T_j=25 °C.

Typical Characteristics: (T_C=25°C unless otherwise noted)

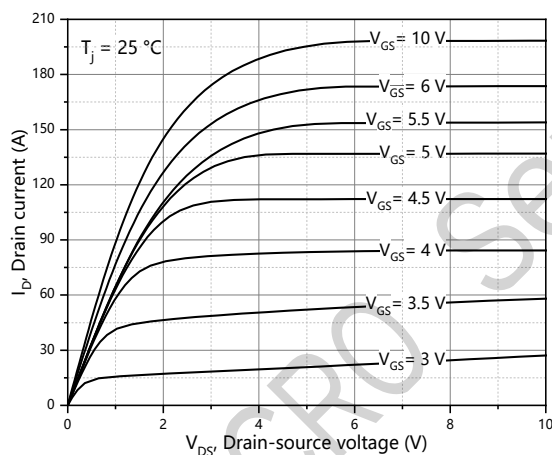


Figure 1. Typ. output characteristics

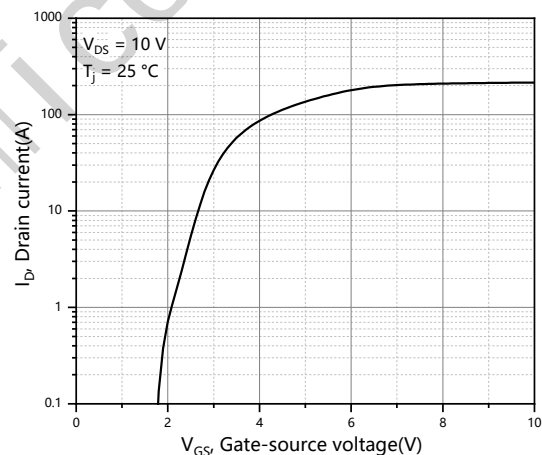


Figure 2. Typ. transfer characteristics

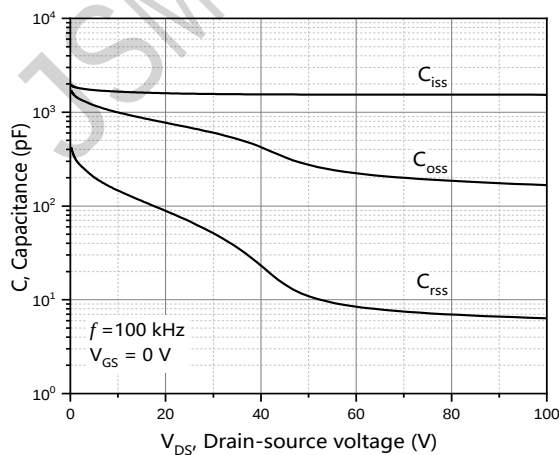


Figure 3. Typ. capacitances

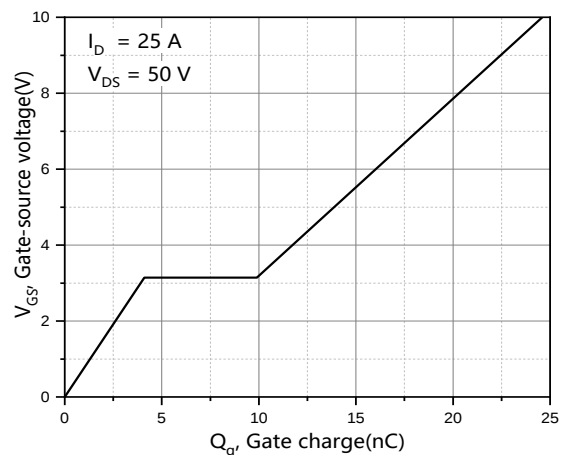


Figure 4. Typ. gate charge

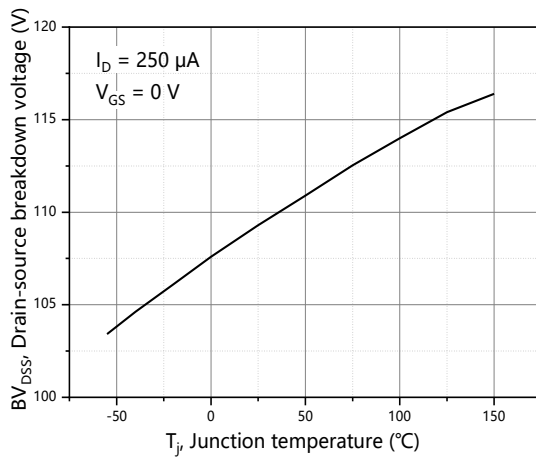


Figure 5. Drain-source breakdown voltage

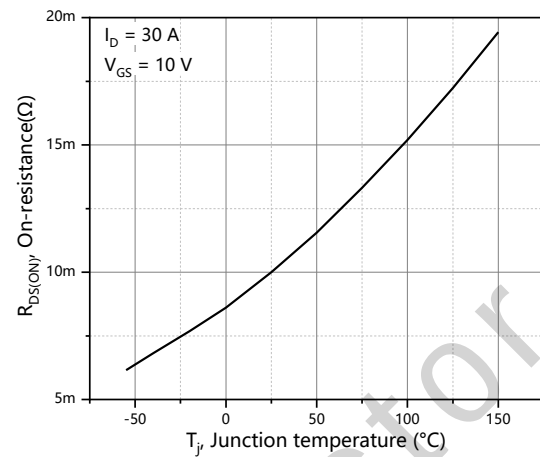


Figure 6. Drain-source on-state resistance

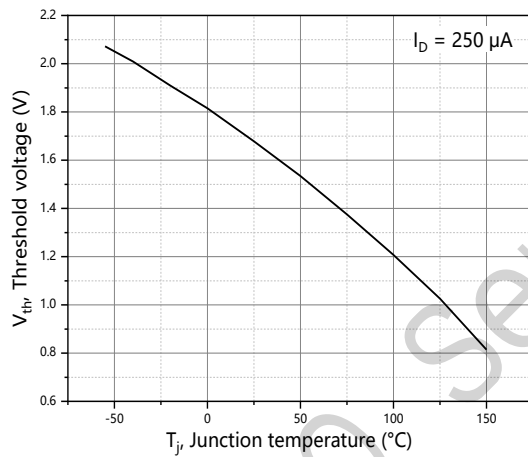


Figure 7. Threshold voltage

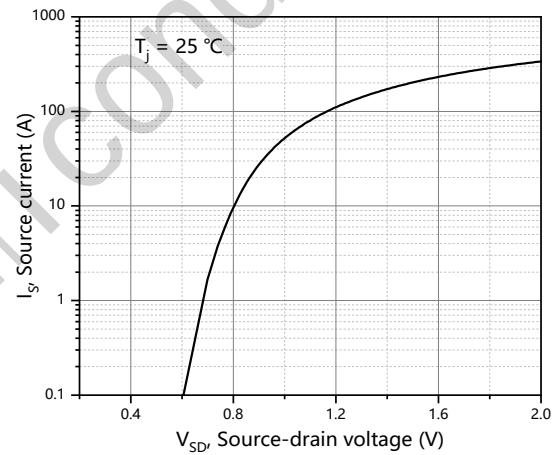


Figure 8. Forward characteristic of body diode

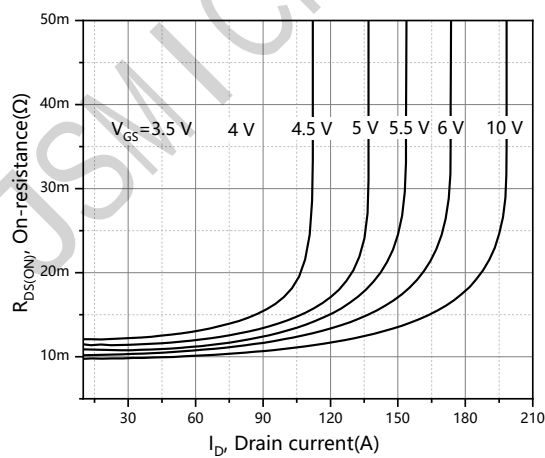


Figure 9. Drain-source on-state resistance

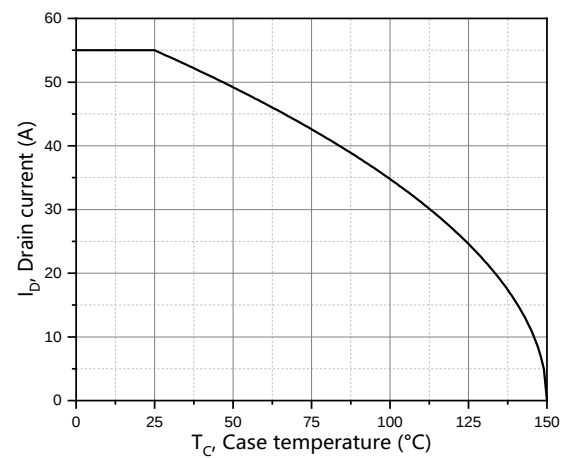


Figure 10. Drain current

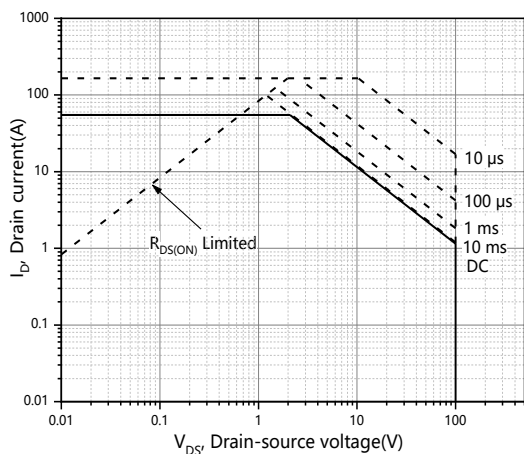


Figure 11. Safe operation area $T_c = 25^\circ\text{C}$

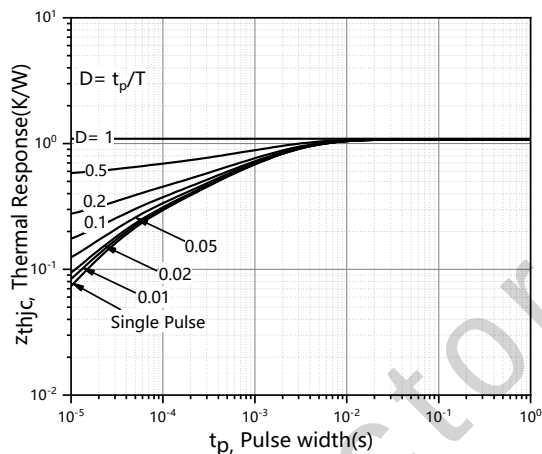


Figure 12. Max transient thermal impedance

TO-252 Package Dimensions

UNIT: mm

SYMBOL	min	nom	max	SYMBOL	min	nom	max
A	6.40		6.60	D	2.90		3.10
A1	5.20		5.40	D1	0.45		0.55
A2	4.40		4.60	D2	0.45		0.55
A3	4.40		4.60	e		2.30	
A4	0		0.15	E	2.20		2.40
A5	4.65		4.95	F	0.45		0.55
B	5.90		6.20	G		1.70	
B1	1.57		1.77	L	1.40		1.60
C	0.90		0.96	θ (度)	0		10.00

