

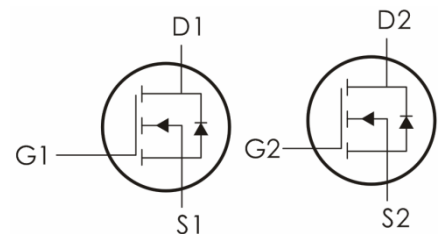
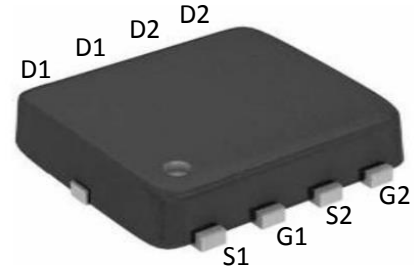
N-Channel Enhancement Mode MOSFET

Description:

These Dual N-Channel enhancement mode power field effect transistors are using SGT DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

Features:

- 1) $V_{DS}=60V, I_D=40A, R_{DS(ON)} < 13m\Omega @ V_{GS}=10V$
- 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: ($T_c=25^\circ\text{C}$ 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- $t_c=25^\circ\text{C}$	40	A
I_{DM}	Pulsed drain current ²⁾	120	A
P_D	Continuous-Source Current ³⁾	55	W
E_{AS}	Single pulsed avalanche energy ⁵⁾	20	mJ
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ\text{C}$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	2.27	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient ⁴⁾	62	

Package Marking and Ordering Information:

Part NO.	Marking	Package
IPG20N06S4L-26	20N06	DFN5*6D

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Sourtce 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	1.0	---	2.5	V
R _{DS(ON)}	Drain-Source On Resistance	V _{GS} =10V, I _D =20A	---	9.6	13	m Ω
		V _{GS} =4.5V, I _D =10A	---	13.5	17	m Ω
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1MHz	---	1050	---	pF
C _{Oss}	Output Capacitance		---	300	---	
C _{rss}	Reverse Transfer Capacitance		---	16	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DS} =30V, I _D =30A, V _{GS} =10V, R _G =2Ω	---	18	--	ns
t _r	Rise Time		---	3.1	---	ns
t _{d(off)}	Turn-Off Delay Time		---	30	---	ns
t _f	Fall Time		---	3.3	---	ns
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =30V, I _D =30A	---	15	---	nC
Q _{gs}	Gate-Source Charge		---	3.2	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	2.6	---	nC
Drain-Source Diode Characteristics						
V _{SD}	Source-Drain Diode Forward Voltage	V _{GS} =0V, I _S =20A	---	---	1.3	V

I_s	Continuous Drain Current	$V_D=V_G=0V$	---	40	---	A
I_{SM}	Pulsed drain current	$V_D=V_G=0V$	---	120	---	A
t_{rr}	Reverse Recovery Time	$V_{GS}=0V, I_{DS}=30 A$ $dI_{SD}/dt = 100 A/\mu s$	---	40.4	---	Ns
q_{rr}	Reverse Recovery Charge		---	20.7	---	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) 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 $T_a=25^\circ C$.
- 5) $V_{DD}=50 V, V_{GS}=10 V, L=0.3 mH$, starting $T_j=25^\circ C$.

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

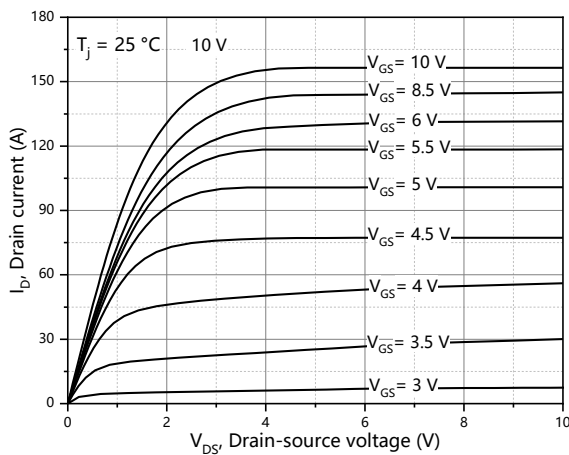


Figure 1. Typ. output characteristics

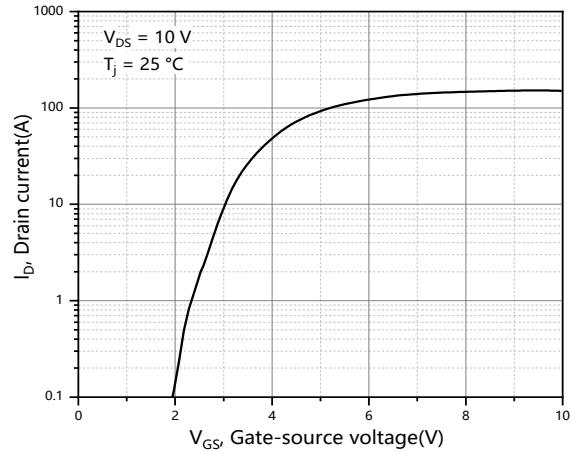


Figure 2. Typ. transfer characteristics

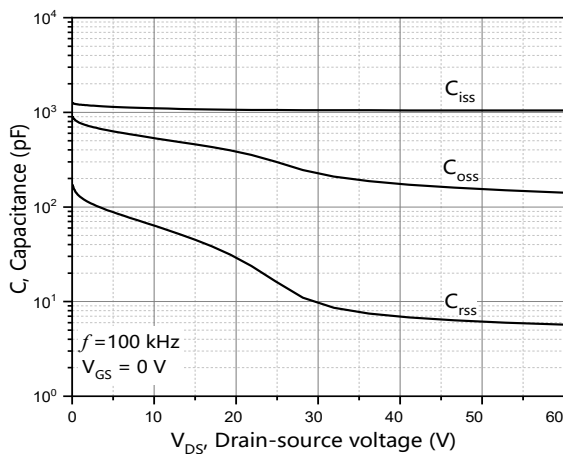


Figure 3. Typ. capacitances

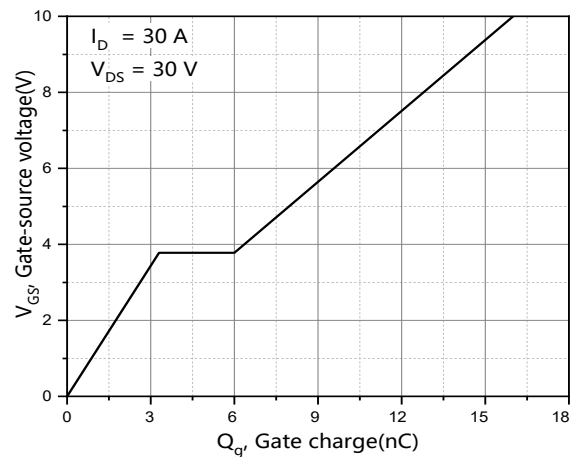


Figure 4. Typ. gate charge

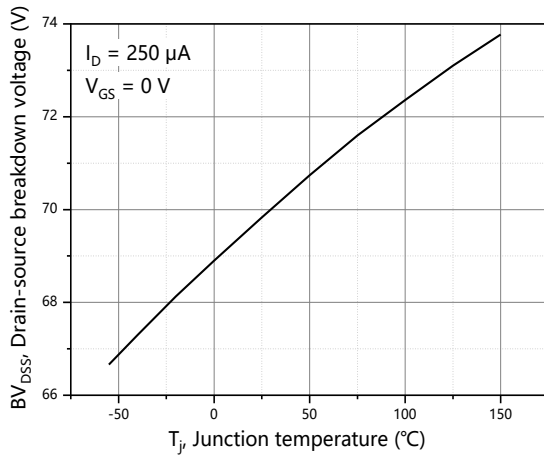


Figure 5. Drain-source breakdown voltage

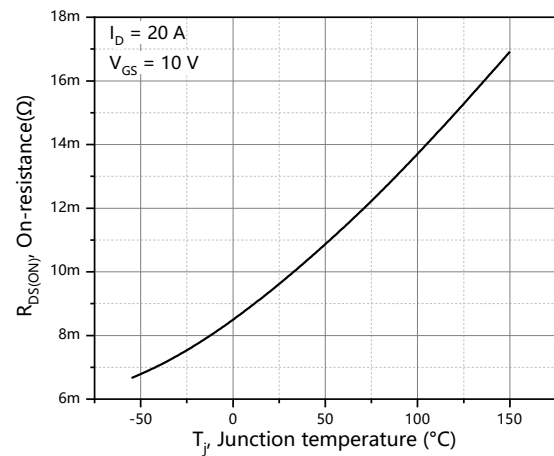


Figure 6. Drain-source on-state resistance

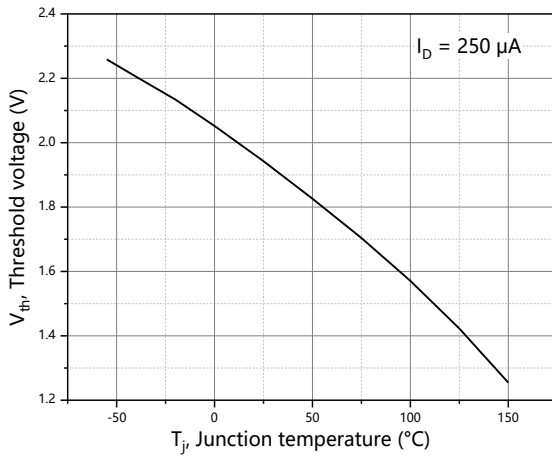


Figure 7. Threshold voltage

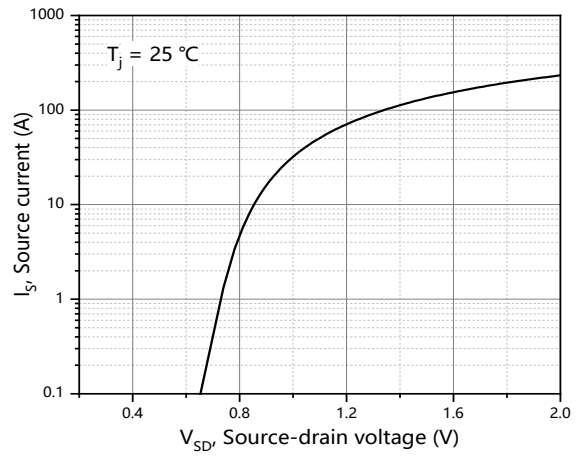


Figure 8. Forward characteristic of body diode

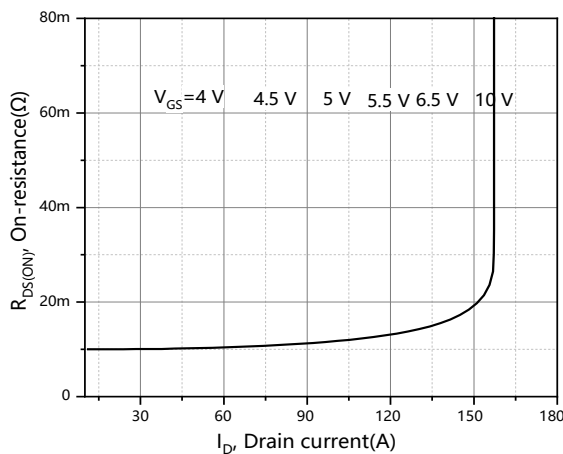


Figure 9. Drain-source on-state resistance

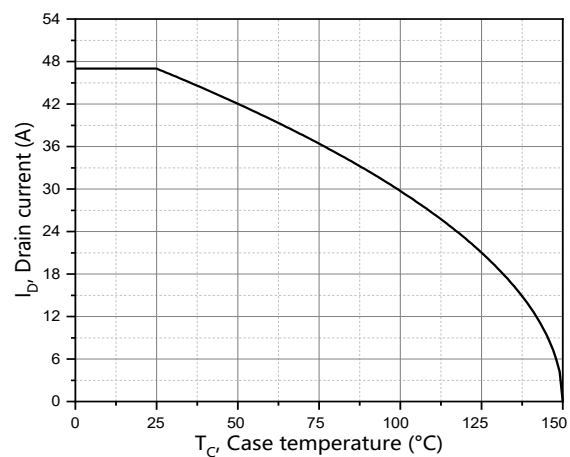


Figure 10. Drain current

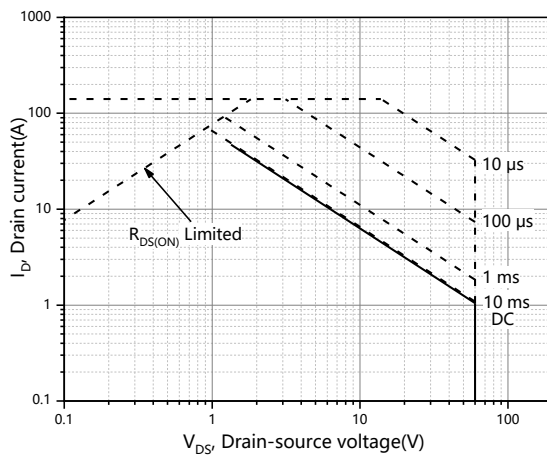


Figure 11. Safe operation area $T_c=25\text{ }^{\circ}\text{C}$

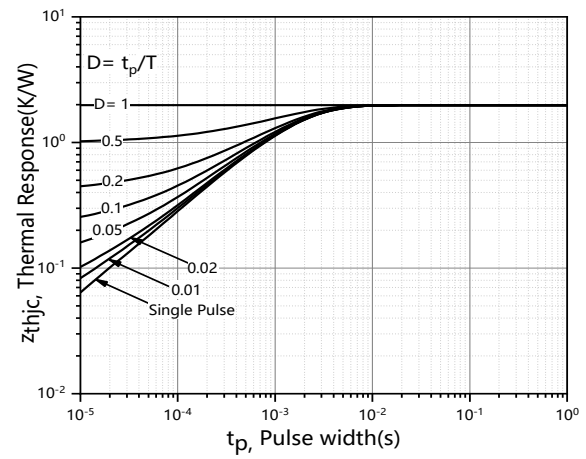


Figure 12. Max. transient thermal impedance