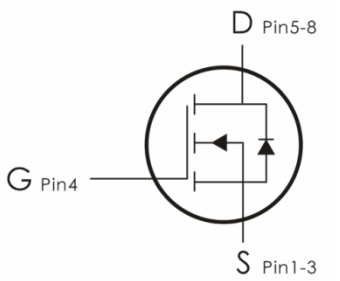
Description：

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=40A,$R_{DS(ON)}$<20mΩ @V_{GS}=10V
2) Low gate charge.
3) Green device available.
4) Advanced high cell denity trench technology for ultra $R_{DS(ON)}$.
5) Excellent package for good heat dissipation.



Absolute Maximum Ratings： (T_C=25℃ 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-TC=25℃[1]	40	A
	Continuous Drain Current-TC=100℃	---	
	Pulsed Drain Current[2]	120	
E_{AS}	Single Pulse Avalanche Energy[5]	30	mJ
P_D	Power Dissipation[3]	72	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	℃

Thermal Characteristics：

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance,Junction to Case	1.74	℃/W
$R_{\theta JA}$	Thermal Resistance Junction to mbient[4]	62	℃/W

Package Marking and Ordering Information：

Part NO.	Marking	Package
PH020TG	H020T	TO-220

Electrical Characteristics： (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Sourtce Breakdown Voltage	V_{GS}=0V,I_D=250μA	100	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{GS}=0V, V_{DS}=100V	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V, V_{DS}=0A	---	---	±100	nA
On Characteristics[3]						
$V_{GS(th)}$	GATE-Source Threshold Voltage	V_{GS}=V_{DS}, I_D=250μA	1	---	2.5	V
$R_{DS(ON)}$	Drain-Source On Resistance	V_{GS}=10V,I_D=8A	---	17	20	mΩ
		V_{GS}=4.5V,I_D=6A	---	---	26	
Dynamic Characteristics[4]						
C_{iss}	Input Capacitance	V_{DS}=50V, V_{GS}=0V, f=1MHz	---	1190.6	---	pF
C_{oss}	Output Capacitance		---	194.6	---	
C_{rss}	Reverse Transfer Capacitance		---	4.1	---	
Switching Characteristics[4]						
$t_{d(on)}$	Turn-On Delay Time	V_{DD}=50V,I_D=10A,R_G=2.2Ω V_{GS}=10V	---	17.8	---	ns
t_r	Rise Time		---	3.9	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	33.5	---	ns
t_f	Fall Time		---	3.2	---	ns
Q_g	Total Gate Charge	V_{GS}=10V, V_{DS}=50V, I_D=8A	---	19.8	---	nC
Q_{gs}	Gate-Source Charge		---	2.4	---	nC
Q_{gd}	Gate-Drain “Miller” Charge		---	5.3	---	nC
Drain-Source Diode Characteristics						
Symbol	**Parameter**	**Conditions**	**Min**	**Typ**	**Max**	**Units**
V_{SD}	Source-Drain Diode Forward Voltage	V_{GS}=0V,I_S=8A	---	---	1.3	V

IS	Continuous Source Current	VGS\<Vth	---	---	40	A
Isp	Pulsed Source Current		---	---	120	
Trr	Reverse Recovery Time	I_S=8 A, di/dt=100 A/μs	---	50.2	---	NS
Qrr	Reverse Recovery Charge		---	95.1	---	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 ℃.
5) V_{DD}=50 V, R_G=25 Ω, L=0.3 mH, starting T_j=25 ℃.

Typical Characteristics: (T_C=25℃ unless otherwise noted)

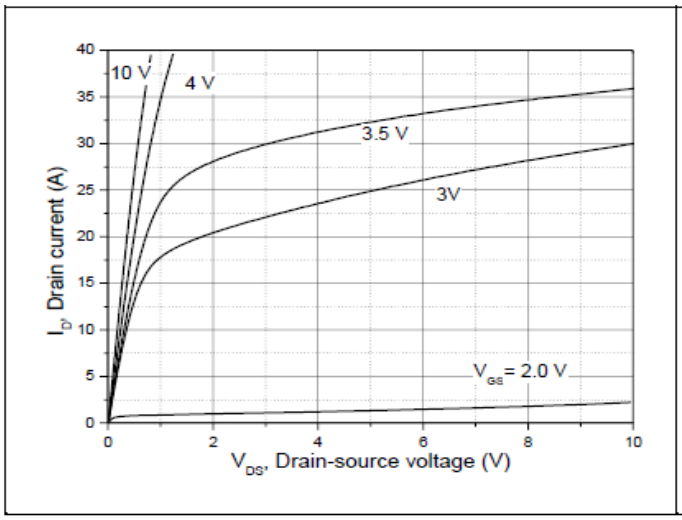


Figure 1, Typ. output characteristics

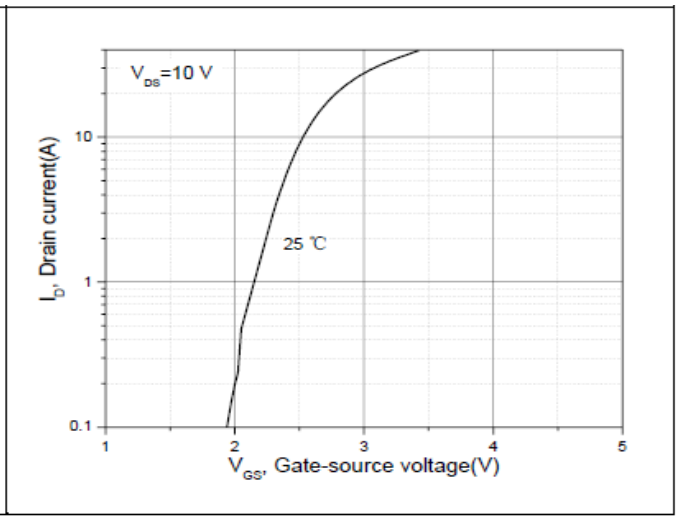


Figure 2, Typ. transfer characteristics

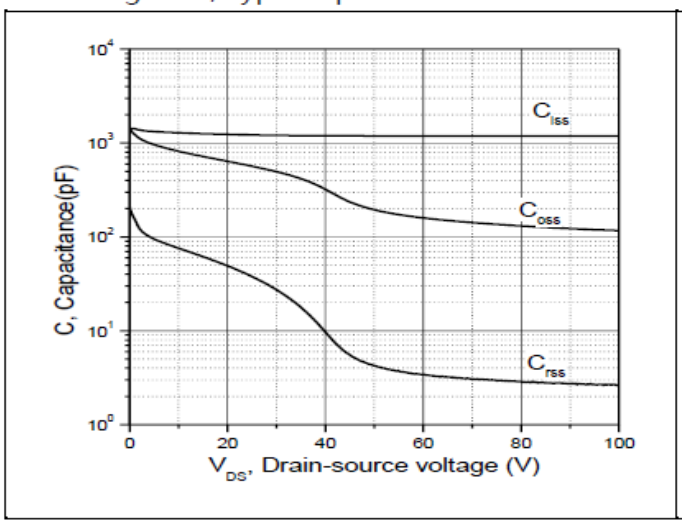


Figure 3, Typ. capacitances

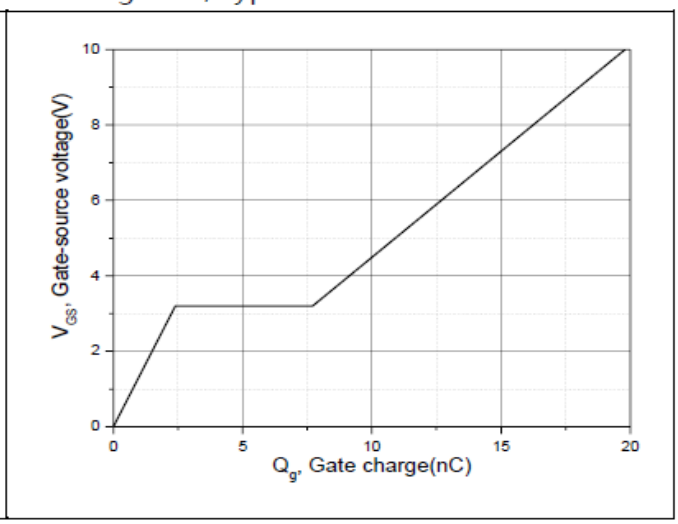


Figure 4, Typ. gate charge

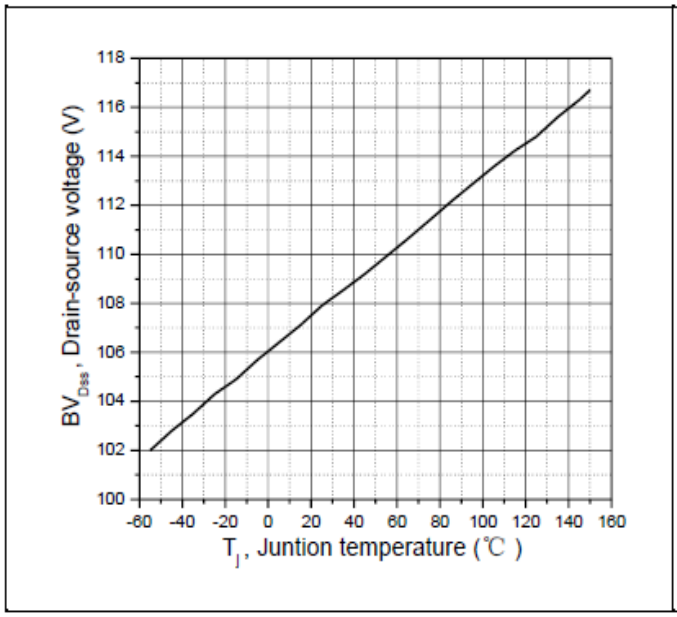


Figure 5, Drain-source breakdown voltage

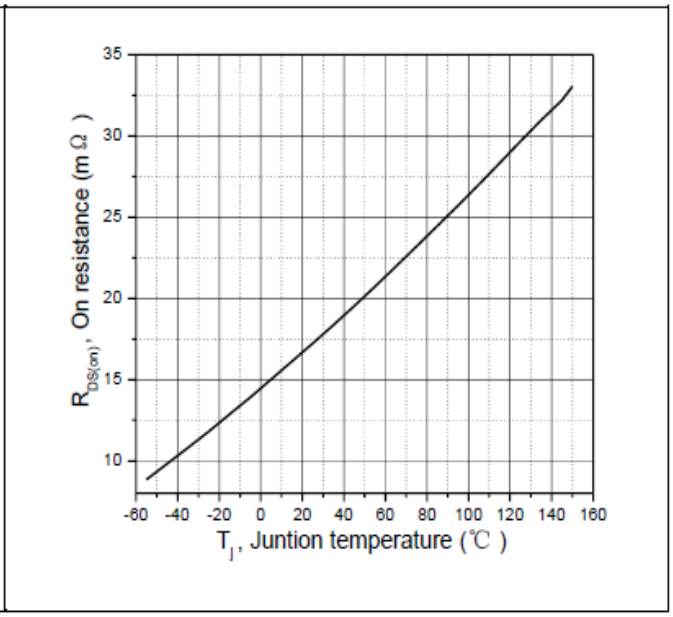


Figure 6, Drain-source on-state resistance

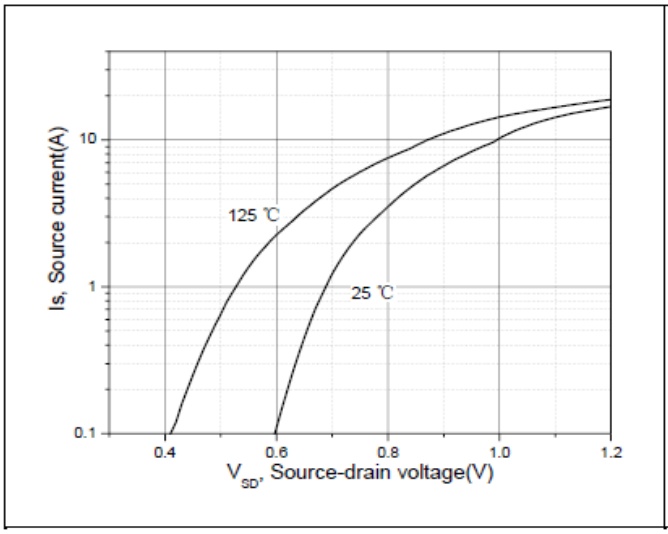


Figure 7, Forward characteristic of body diode

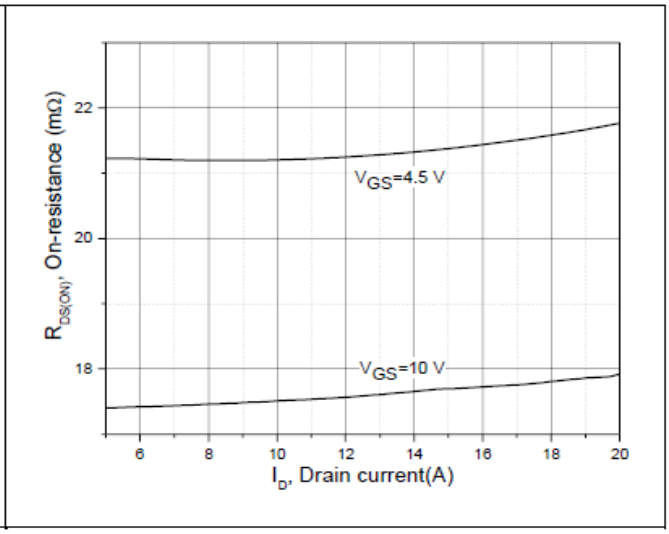


Figure 8, Drain-source on-state resistance

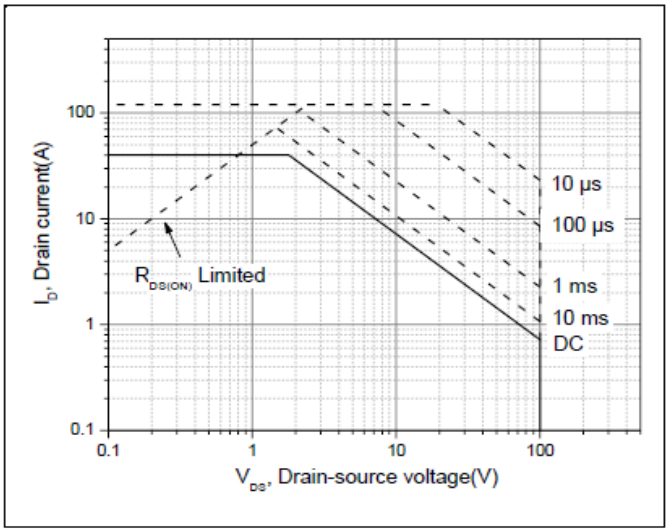


Figure 9, Safe operation area T_C=25 ℃