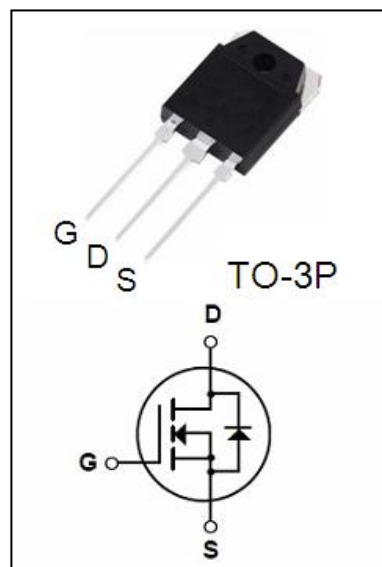


●Features:

- 20.0A, 600V, $R_{DS(on)(Typ)} = 0.31\Omega @ V_{GS}=10V$
- Low Gate Charge
- Low C_{rss}
- 100% Avalanche Tested
- Fast Switching
- Improved dv/dt Capability

●Application:

- High Frequency Switching Mode Power Supply
- Active Power Factor Correction


Absolute Maximum Ratings($T_c=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Value	Unit
V_{DSS}	Drain-Source Voltage	600	V
I_D	Drain Current - Continuous($T_c=25^\circ\text{C}$) - Continuous($T_c=100^\circ\text{C}$)	20.0*	A
		12.5*	A
I_{DM}	Drain Current -Pulsed (Note1)	80*	A
V_{GSS}	Gate-Source Voltage	± 30	V
E_{AS}	Single Pulsed Avalanche Energy (Note2)	1280	mJ
I_{AR}	Avalanche Current (Note1)	20.0	A
E_{AR}	Repetitive Avalanche Energy (Note1)	37	mJ
dv/dt	Peak Diode Recovery dv/dt (Note3)	4.5	V/ns
P_D	Power Dissipation($T_c = 25^\circ\text{C}$) -Derate above 25°C	250	W
		2	W/ $^\circ\text{C}$
T_j	Operating Junction Temperature	150	$^\circ\text{C}$
T_{stg}	Storage Temperature Range	-55 to +150	$^\circ\text{C}$

* Drain Current Limited by Maximum Junction Temperature.

Thermal Characteristics

Symbol	Parameter	Max	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case	0.5	$^\circ\text{C} / \text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	50	$^\circ\text{C} / \text{W}$

	SMP20N60
	600V N-Channnel MOSFET

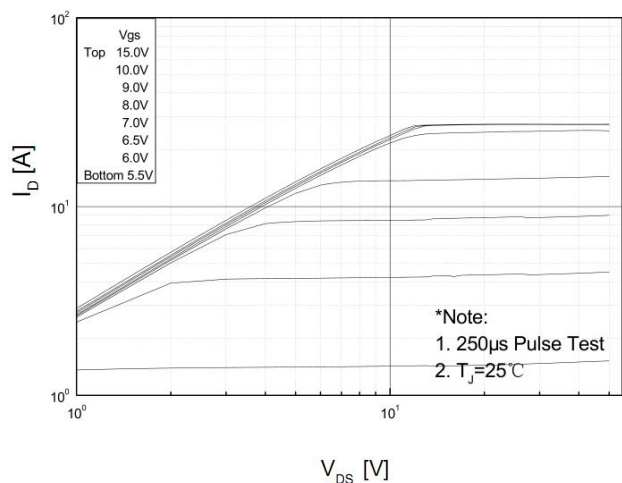
Electrical Characteristics(Tc=25°C unless otherwise noted)

Symbol	Parameter	Test Conditons	Min	Typ	Max	Unit
Off Characteristics						
BV _{DSS}	Drain-source Breakdown Voltage	V _{GS} =0V ,I _D =250μA	600	--	--	V
ΔBV _{DSS} /ΔT _J	Breakdown Voltage Temperature Coefficient	I _D =250μA (Referenced to 25°C)	--	0.7	--	V/°C
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =600V,V _{GS} =0V	--	--	1	μA
		V _{DS} =480V,T _c =125°C	--	--	10	μA
I _{GSSF}	Gate-Body Leakage Current,Forward	V _{GS} =+30V, V _{DS} =0V	--	--	100	nA
I _{GSSR}	Gate-Body Leakage Current,Reverse	V _{GS} =-30V, V _{DS} =0V	--	--	-100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D =250μA	2.0	--	4.0	V
R _{DS(on)}	Static Drain-Source On-Resistance	V _{GS} =10 V, I _D =10.0A	--	0.31	0.38	Ω
g _{FS}	Forward Transconductance	V _{DS} =40 V, I _D =10.0A (Note4)	--	18.0	--	S
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =25V,V _{GS} =0V, f=1.0MHz	--	2650	--	pF
C _{oss}	Output Capacitance		--	282	--	pF
C _{rss}	Reverse Transfer Capacitance		--	6.3	--	pF
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DD} = 300 V, I _D = 20A, R _G = 25 Ω (Note4,5)	--	26.5	--	ns
t _r	Turn-On Rise Time		--	43.6	--	ns
t _{d(off)}	Turn-Off Delay Time		--	81.3	--	ns
t _f	Turn-Off Fall Time		--	43.2	--	ns
Q _g	Total Gate Charge	V _{DS} = 480 V, I _D =20A, V _{GS} = 10 V (Note4,5)	--	46.8	--	nC
Q _{gs}	Gate-Source Charge		--	13.9	--	nC
Q _{gd}	Gate-Drain Charge		--	14.2	--	nC
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain-Source Diode Forward Current		--	--	20	A
I _{SM}	Maximum Pulsed Drain-Source Diode Forward Current		--	--	80	A
V _{SD}	Drain-Source Diode Forward Voltage	V _{GS} =0V,I _S =20A	--	--	1.3	V
t _{rr}	Reverse Recovery Time	V _{GS} =0V, I _S =20A, d I _F /dt=100A/μs (Note4)	--	590	--	ns
Q _{rr}	Reverse Recovery Charge		--	7.58	--	μC

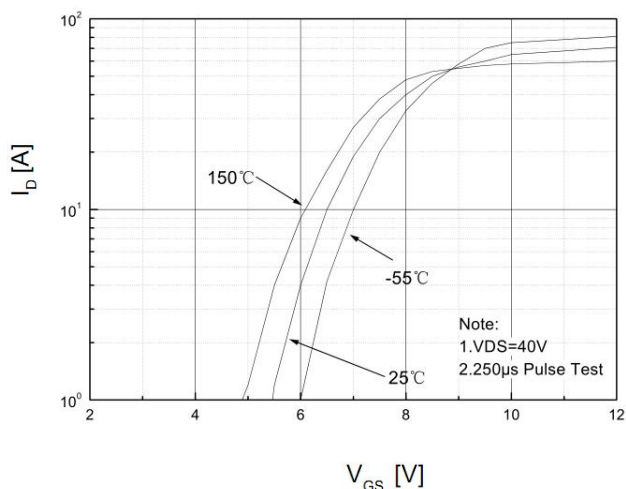
Notes:

- 1、Repetitive Rating:Pulse Width Limited by Maximum Junction Temperature.
- 2、L = 5.0mH, $I_{AS}=20.0A$, $V_{DD}=50V$, $R_G=25\Omega$, Starting $T_J=25^\circ C$.
- 3、 $I_{SD}\leq 20.0A$, $di/dt\leq 200A/\mu s$, $V_{DD}\leq BV_{DSS}$, Starting $T_J=25^\circ C$.
- 4、Pulse Test : Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
- 5、Essentially Independent of Operating Temperature.

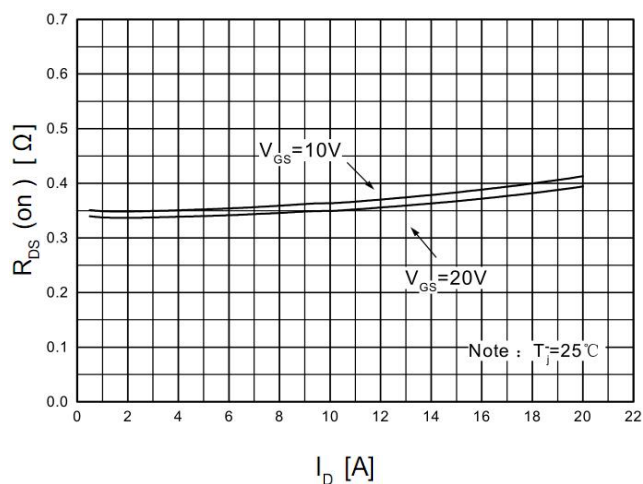
On-Regin Characteristics



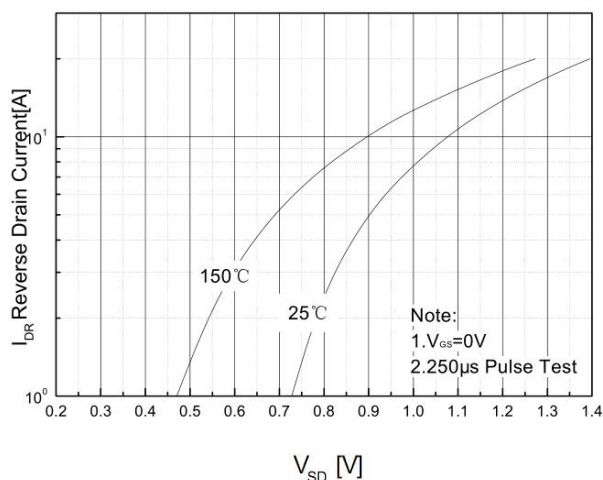
Transfer Characteristics



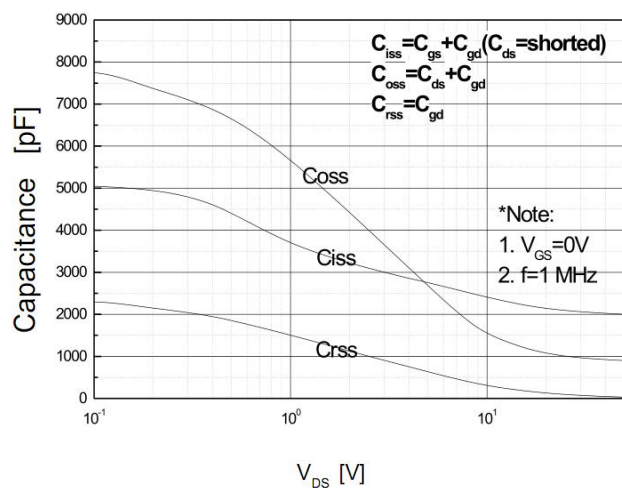
On-Resistance Variation vs. Drain Current and Gate Voltage



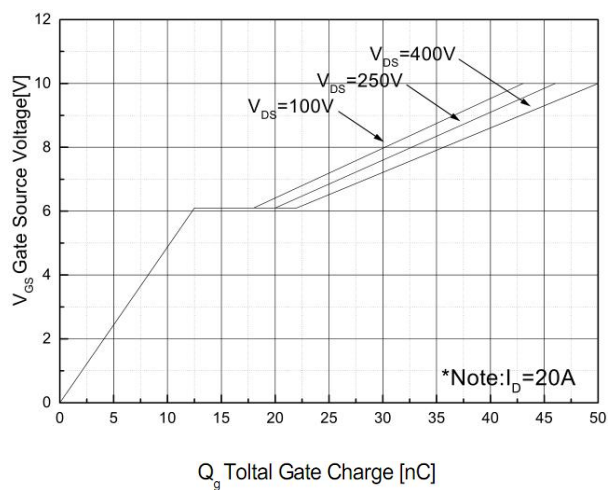
Body Diode Forward Voltage Variation vs. Source Current and Temperature



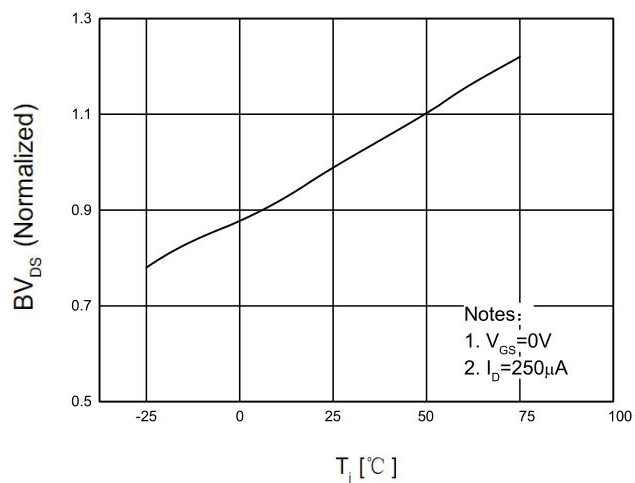
Capacitance Characteristics



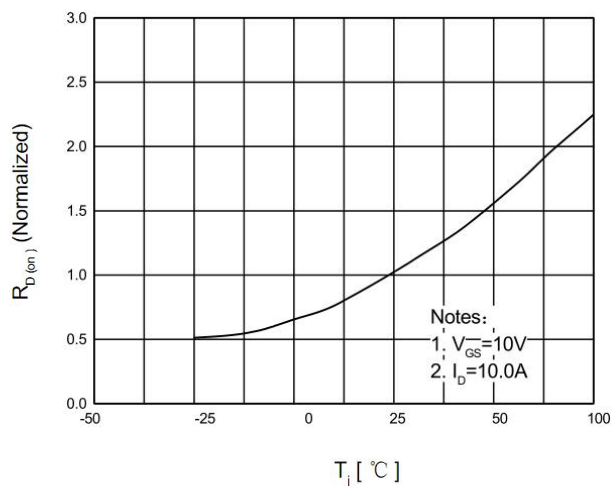
Gate Charge Characteristics



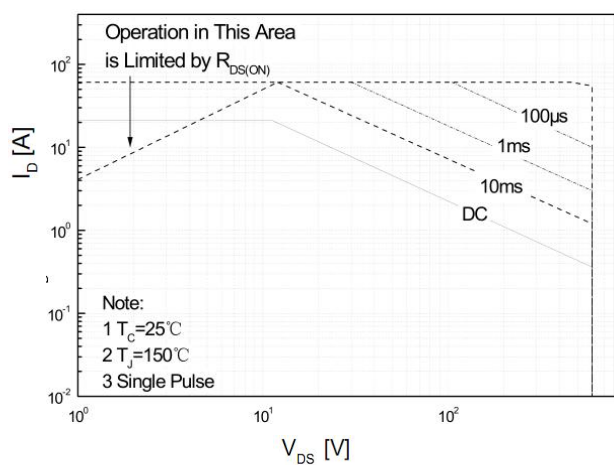
Breakdown Voltage Variation vs. Temperature



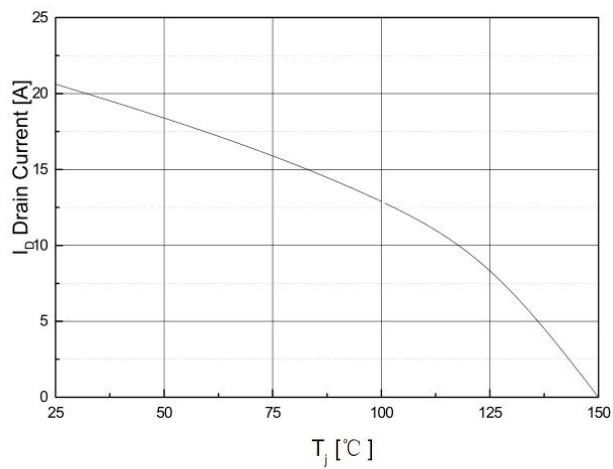
On-Resistance Variation vs. Temperature



Maximum Safe Operating Area



Maximum Drain Current Vs. Case Temperature



TO-3P Package Dimensions

UNIT: mm

SYMBOL	min	nom	max	SYMBOL	min	nom	max
A	4.40		5.10	E	15.20		16.20
A1	1.40	1.50	1.70	E1		13.60	
A2	2.10	2.40	2.70	E2		9.60	
b	0.80	1.00	1.20	e	5.15	5.45	5.75
b1	1.90		2.30	L	19.00	20.00	21.00
b2	2.90		3.30	L1	2.50		3.50
C	0.45	0.60	0.75	Q		5.10	
D	19.40	19.90	20.40	Q1		3.90	
D1		13.90					

