



SMT5N60

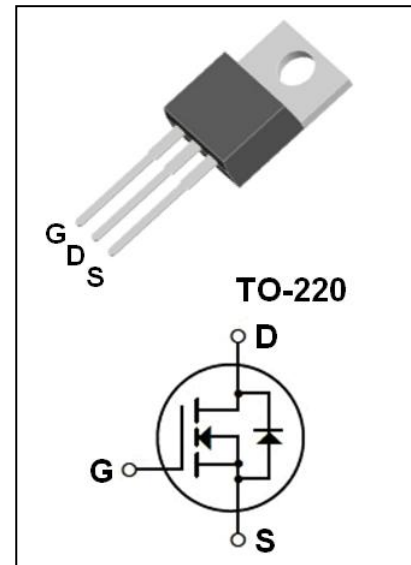
600V N-Channel MOSFET

●Features:

- 5.0A, 600V, $R_{DS(on)(Typ)} = 1.9\Omega @ V_{GS}=10V$
- 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 ($T_C=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Value	Unit
V_{DSS}	Drain-Source Voltage	600	V
I_D	Drain Current - Continuous ($T_C=25^\circ C$) - Continuous ($T_C=100^\circ C$)	5.0*	A
		3.1*	A
I_{DM}	Drain Current - Pulsed (Note1)	20*	A
V_{GSS}	Gate-Source Voltage	± 30	V
E_{AS}	Single Pulsed Avalanche Energy (Note2)	245	mJ
I_{AR}	Avalanche Current (Note1)	5.0	A
E_{AR}	Repetitive Avalanche Energy (Note1)	10.5	mJ
dv/dt	Peak Diode Recovery dv/dt (Note3)	4.5	V/ns
P_D	Power Dissipation ($T_C = 25^\circ C$) - Derate above $25^\circ C$	35	W
		0.27	W/ $^\circ C$
T_j	Operating Junction Temperature	150	$^\circ C$
T_{stg}	Storage Temperature Range	-55 to +150	$^\circ C$

* Drain Current Limited by Maximum Junction Temperature.

Thermal Characteristics

Symbol	Parameter	Max	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case	3.57	$^\circ C / W$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	62.5	$^\circ C / W$



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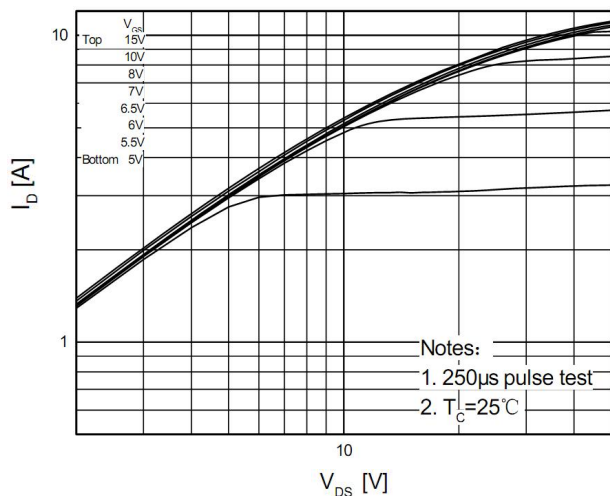
Electrical Characteristics(Tc=25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	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)	--	0.65	--	V/°C
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =600V, V _{GS} =0V	--	--	1	μA
		V _{DS} =480V, Tc=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 =2.5A	--	1.9	2.5	Ω
g _{FS}	Forward Transconductance	V _{DS} =40 V, I _D =2.0A (Note4)	--	3.6	--	S
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1.0MHz	--	568	--	pF
C _{oss}	Output Capacitance		--	63	--	pF
C _{rss}	Reverse Transfer Capacitance		--	11	--	pF
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DD} = 300 V, I _D = 5.0 A, R _G = 25 Ω (Note4,5)	--	31	--	ns
t _r	Turn-On Rise Time		--	76	--	ns
t _{d(off)}	Turn-Off Delay Time		--	61	--	ns
t _f	Turn-Off Fall Time		--	56	--	ns
Q _g	Total Gate Charge	V _{DS} = 480 V, I _D =5.0 A, V _{GS} = 10 V (Note4,5)	--	13	--	nC
Q _{gs}	Gate-Source Charge		--	4.1	--	nC
Q _{gd}	Gate-Drain Charge		--	4.9	--	nC
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain-Source Diode Forward Current		--	--	5.0	A
I _{SM}	Maximum Pulsed Drain-Source Diode Forward Current		--	--	20	A
V _{SD}	Drain-Source Diode Forward Voltage	V _{GS} =0V, I _S =4.0A	--	--	1.4	V
t _{rr}	Reverse Recovery Time	V _{GS} =0V, I _S =4.0A, d I _F /dt=100A/μs (Note4)	--	332	--	ns
Q _{rr}	Reverse Recovery Charge		--	2.69	--	μC

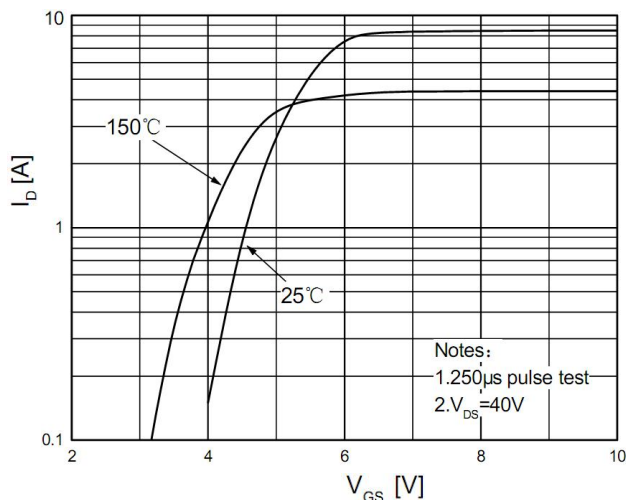
Notes:

- 1、Repetitive Rating:Pulse Width Limited by Maximum Junction Temperature.
- 2、L = 25.0mH, I_{AS} =5.0A, V_{DD} = 50V, R_G = 25 Ω, Starting T_J = 25°C.
- 3、I_{SD}≤5.0A, di/dt≤200A/μs, V_{DD}≤BV_{DSS}, Starting T_J = 25°C.
- 4、Pulse Test : Pulse Width ≤300 μ s, Duty Cycle≤2%.
- 5、Essentially Independent of Operating Temperature.

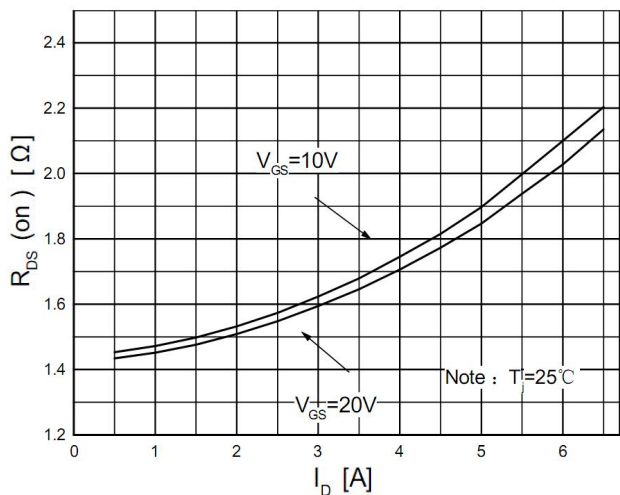
On-Regin Characteristics



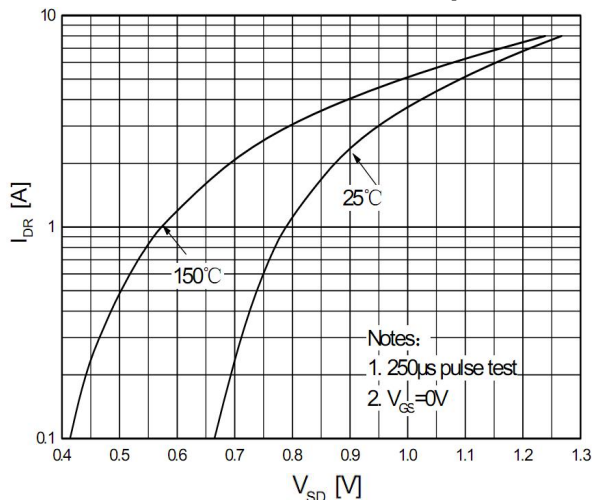
Transfer Characteristics



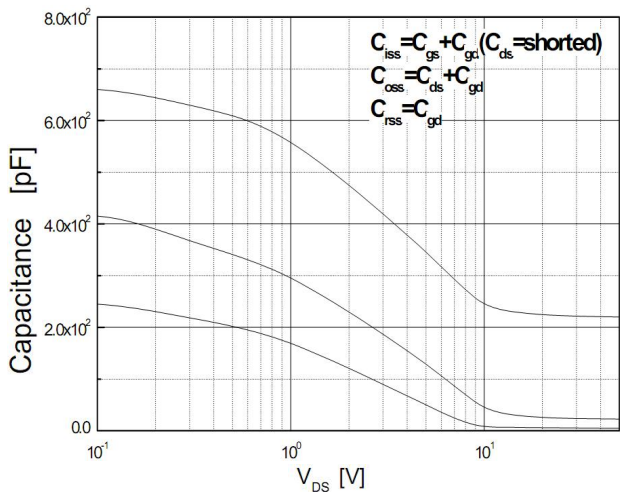
On-Resistance Variation vs. Drain Current and Gate Voltage



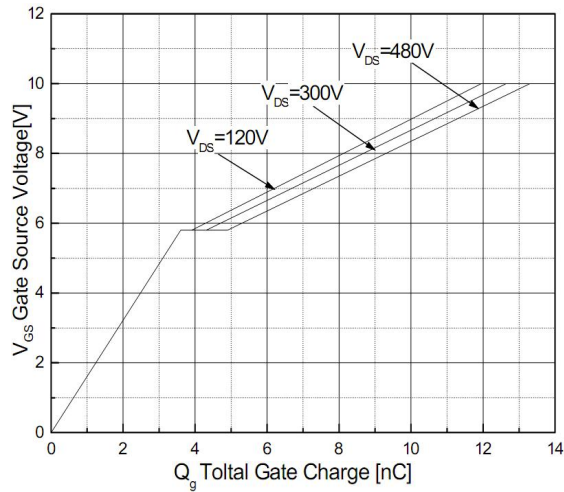
Body Diode Forward Voltage Variation vs. Source Current and Temperature



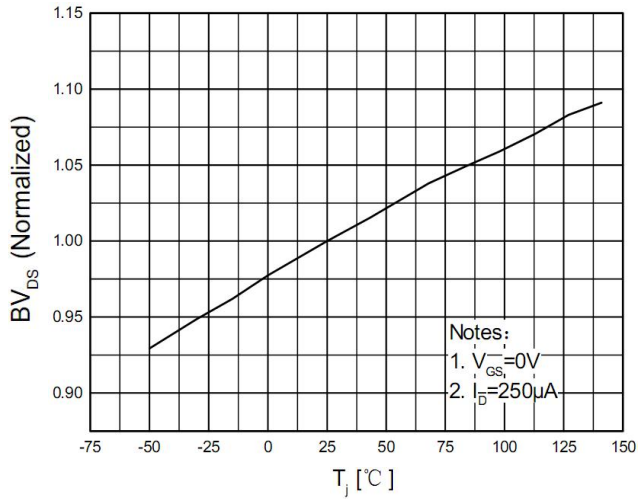
Capacitance Characteristics



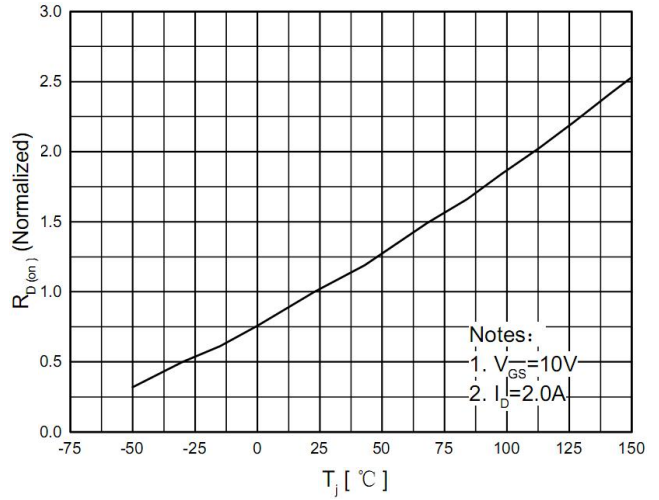
Gate Charge Characteristics



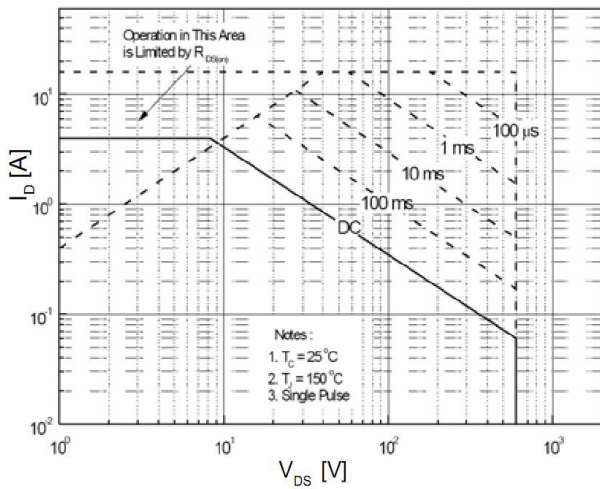
Breakdown Voltage Variation vs. Temperature



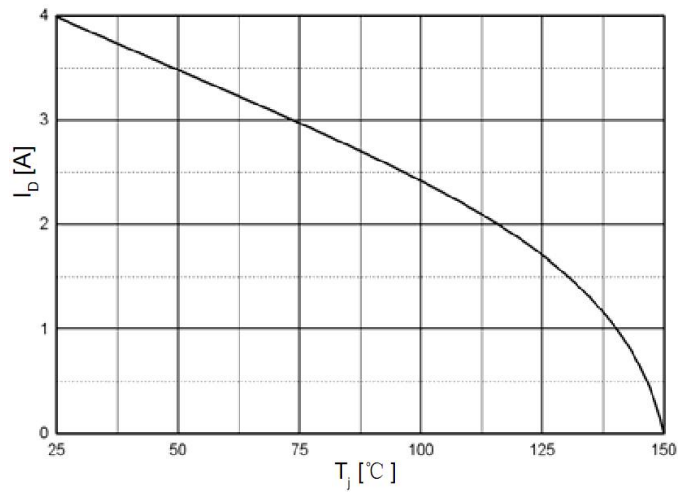
On-Resistance Variation vs. Temperature



Maximum Safe Operating Area



Maximum Drain Current Vs. Case Temperature



TO-220 MECHANICAL DATA

UNIT: mm

SYMBOL	min	nom	max	SYMBOL	min	nom	max
A	4.00		4.80	E	9.70		10.70
B	1.15		1.45	e		2.54	
B1	0.90		1.40	F	1.10		1.40
b1	0.65		0.95	L	12.50		14.50
c	0.30		0.50	L1	2.90	3.40	3.90
D	14.40		16.40	Q	2.50		3.10
D1	5.90		6.90	Q1	2.00		3.00
				ϕP	3.60		4.00

