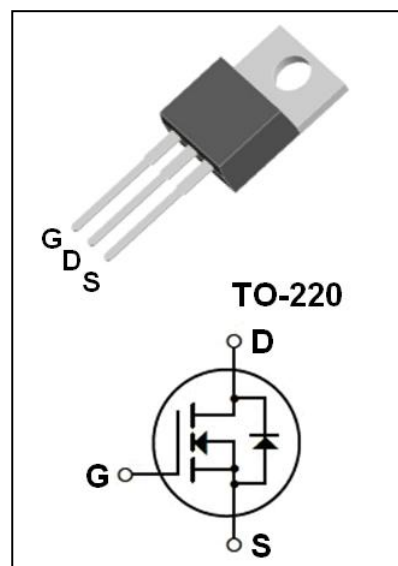


●Features:

- 4.0A, 650V, $R_{DS(on)(Typ)} = 2.2\Omega @ V_{GS}=10V$
- 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	650	V
I_D	Drain Current - Continuous($T_c=25^\circ\text{C}$) - Continuous($T_c=100^\circ\text{C}$)	4.0*	A
		2.5*	A
I_{DM}	Drain Current -Pulsed (Note1)	16*	A
V_{GSS}	Gate-Source Voltage	± 30	V
E_{AS}	Single Pulsed Avalanche Energy (Note2)	240	mJ
I_{AR}	Avalanche Current (Note1)	4.0	A
E_{AR}	Repetitive Avalanche Energy (Note1)	10.0	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	33	W
		0.26	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	3.79	$^\circ\text{C} / \text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	62.5	$^\circ\text{C} / \text{W}$

	SMT4N65
	650V N-Channnel MOSFET

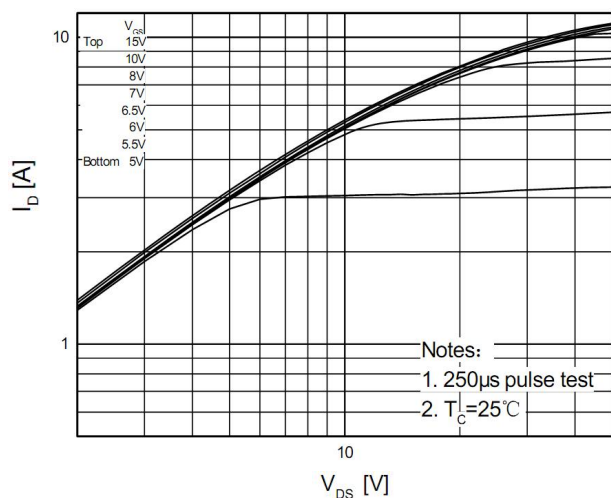
Electrical Characteristics(Tc=25°C unless otherwise noted)

Symbol	Parameter	Test Conditons	Min	Typ	Max	Unit
Off Characteristics						
BV _{DSS}	Drain-source Breakdown Voltage	V _{GS} =0V ,I _D =250μA	650	--	--	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} =650V,V _{GS} =0V	--	--	1	μA
		V _{DS} =520V,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 =2.0A	--	2.2	2.6	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	--	560	--	pF
C _{oss}	Output Capacitance		--	62	--	pF
C _{rss}	Reverse Transfer Capacitance		--	10	--	pF
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DD} = 325 V, I _D = 4.0 A, R _G = 25 Ω (Note4,5)	--	30	--	ns
t _r	Turn-On Rise Time		--	75	--	ns
t _{d(off)}	Turn-Off Delay Time		--	60	--	ns
t _f	Turn-Off Fall Time		--	55	--	ns
Q _g	Total Gate Charge	V _{DS} = 520 V, I _D =4.0 A, V _{GS} = 10 V (Note4,5)	--	12	--	nC
Q _{gs}	Gate-Source Charge		--	4.0	--	nC
Q _{gd}	Gate-Drain Charge		--	4.8	--	nC
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain-Source Diode Forward Current		--	--	4.0	A
I _{SM}	Maximum Pulsed Drain-Source Diode Forward Current		--	--	16	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)	--	330	--	ns
Q _{rr}	Reverse Recovery Charge		--	2.67	--	μC

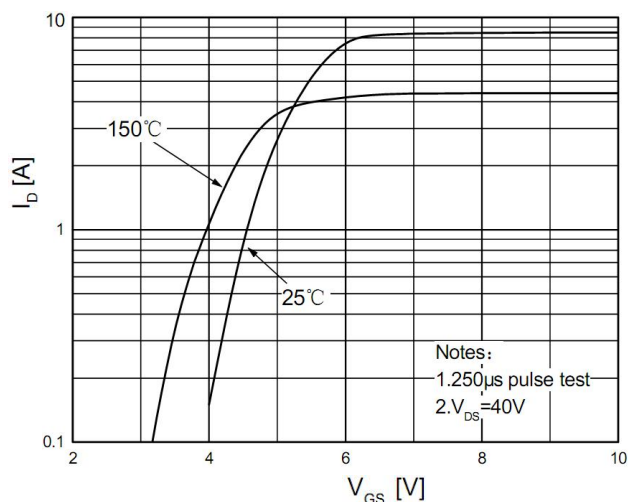
Notes:

- 1、Repetitive Rating:Pulse Width Limited by Maximum Junction Temperature.
- 2、L = 25.0mH, $I_{AS}=4.0A$, $V_{DD}=50V$, $R_G=25\Omega$, Starting $T_J=25^\circ C$.
- 3、 $I_{SD}\leq 4.0A$, $di/dt\leq 200A/\mu s$, $V_{DD}\leq BV_{DSS}$, 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.

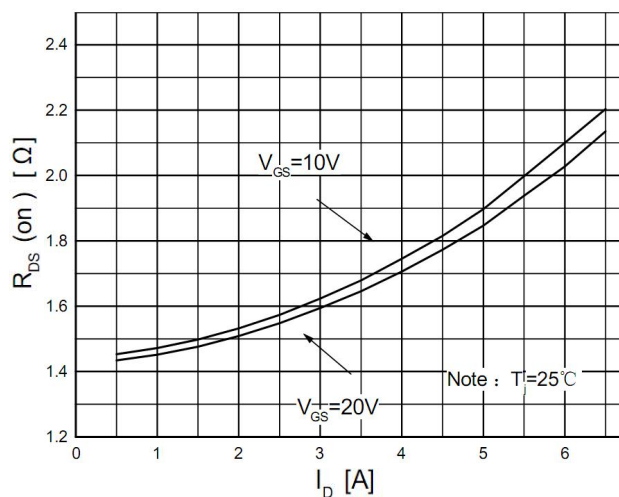
On-Regin Characteristics



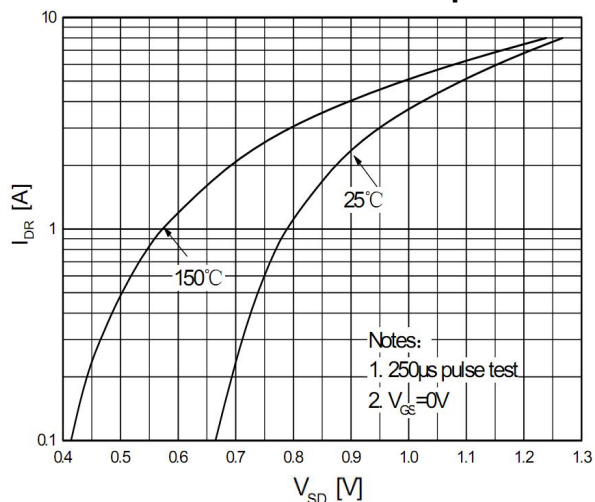
Transfer Characteristics



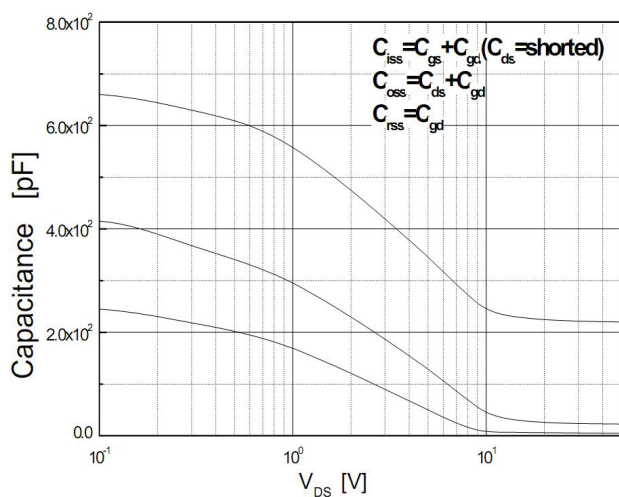
On-Resistance Variation vs. Drain Current and Gate Voltage



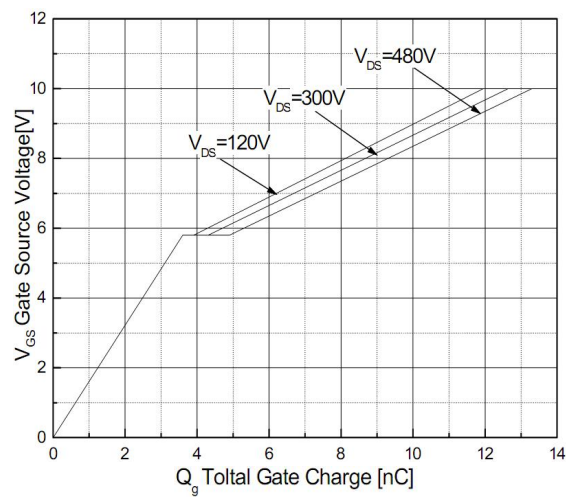
Body Diode Forward Voltage Variation vs. Source Current and Temperature



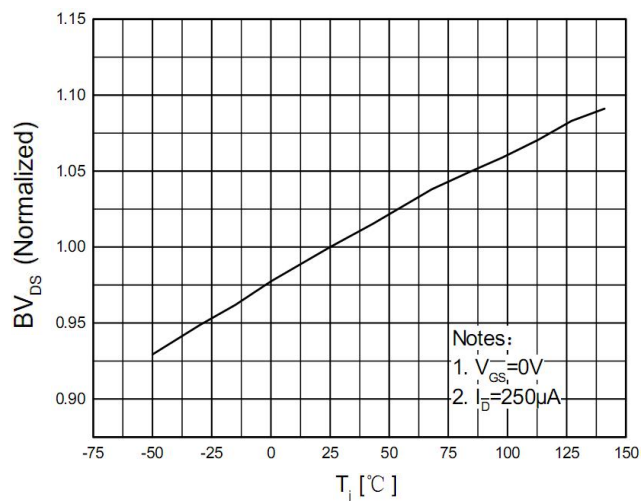
Capacitance Characteristics



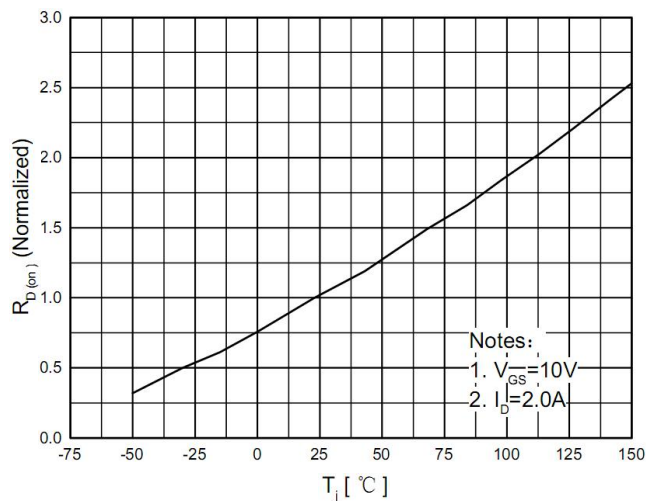
Gate Charge Characteristics



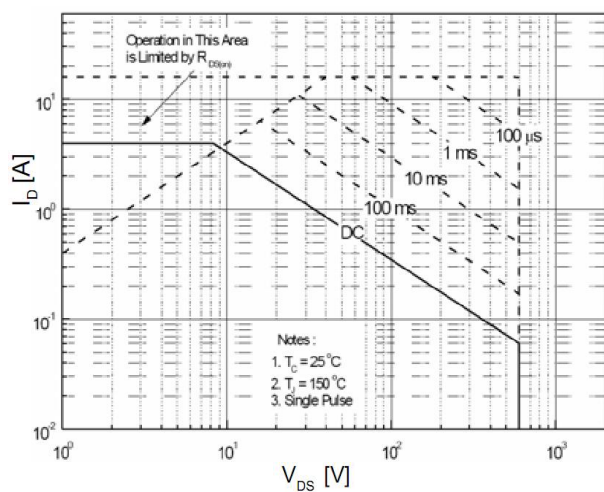
Breakdown Voltage Variation vs. Temperature



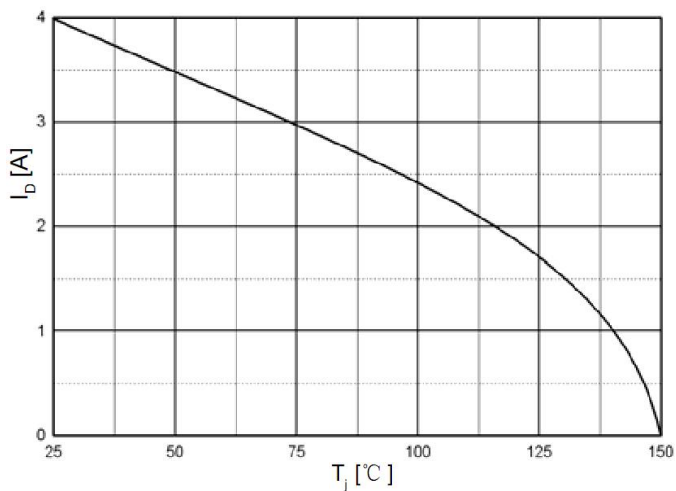
On-Resistance Variation vs. Temperature



Maximum Safe Operating Area



Maximum Drain Current Vs. Case Temperature



TO-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

