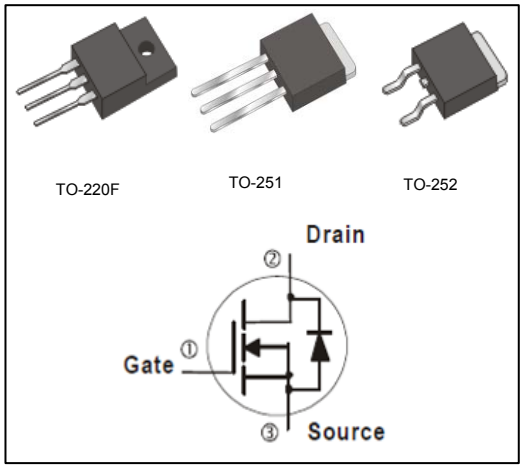
SMU / SMD/SMF3N50

500V N-Channnel POWER MOSFET

500V N-Channel MOSFET

Voltage	500 V	Current	3 A



● Features：

- $R_{DS(ON)}$, V_{GS}@10V,I_D@1.5A<3.5
- High switching speed
- Improved dv/dt capability
- Low Gate Charge
- Low reverse transfer capacitance
- Lead free in compliance with EU RoHS 2011/65/EU directive.
- Green molding compound as per IEC61249 Std. (Halogen Free)

Maximum Ratings and Thermal Characteristics (T_A=25°C unless otherwise noted)

PARAMETER		SYMBOL	TO-251	TO-220F	TO-252	UNITS
Drain-Source Voltage		V_{DS}	500			V
Gate-Source Voltage		V_{GS}	±30			V
Continuous Drain Current		I_D	3			A
Pulsed Drain Current		I_{DM}	12			A
Single Pulse Avalanche Energy (Note 1)		E_{AS}	200			mJ
Power Dissipation	T_C=25°C	P_D	50	25	50	W
	Derate above 25°		0.40	0.20	0.40	W/°C
Operating Junction and Storage Temperature Range		T_J,T_{STG}	-55~150			°C
Typical Thermal resistance - Junction to Case - Junction to Ambient		$R_{\theta JC}$ $R_{\theta JA}$	2.50 110	4.90 62.5	2.50 110	°C/W

- Limited only By Maximum Junction Temperature

PART NO PACKING CODE VERSION

Part No Packing Code	Package Type	Packing type	Marking	Version
SMU3N50_T0_00001	TO-251	80pcs / Tube	3N50	Halogen free
SMD3N50_T0_00001	TO-252	3,000pcs / 13” reel	3N50	Halogen free
SMF3N50_T0_00001	TO-220F	50pcs / Tube	3N50	Halogen free

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

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNITS
Static						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_D=250uA	500	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250uA	2	3.08	4	V
Drain-Source On-State Resistance	$R_{DS(on)}$	V_{GS}=10V,I_D=1.5A	-	3	3.5	Ω
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=500V,V_{GS}=0V	-	-	1.0	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±30V,V_{DS}=0V	-	-	±100	nA
Diode Forward Voltage	V_{SD}	I_S=3A,V_{GS}=0V	-	0.9	1.4	V
Dynamic (Note 4)						
Total Gate Charge	Q_g	V_{DS}=400V, I_D=3A, V_{GS}=10V (Note 2,3)	-	6.5	-	nC
Gate-Source Charge	Q_{gs}		-	2	-	
Gate-Drain Charge	Q_{gd}		-	2.8	-	
Input Capacitance	Ciss	V_{DS}=25V, V_{GS}=0V, f=1.0MHZ	-	260	-	pF
Output Capacitance	Coss		-	41.3	-	
Reverse Transfer Capacitance	Crss		-	0.8	-	
Turn-On Delay Time	$td_{(on)}$	V_{DD}=250V, I_D=3A, R_G=25Ω (Note 2,3)	-	6.1	-	ns
Turn-On Rise Time	t_r		-	20.6	-	
Turn-Off Delay Time	$td_{(off)}$		-	8.4	-	
Turn-Off Fall Time	t_f		-	21.4	-	
Drain-Source Diode						
Maximum Continuous Drain-Source Diode Forward Current	I_S	---	-	-	3	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}	---	-	-	12	A
Reverse Recovery Time	trr	V_{GS}=0V, I_S=3A dI_F/ dt=100A/us (Note 2)	-	381	-	ns
Reverse Recovery Charge	Qrr		-	1.4	-	uC

NOTES :

1. L=40mH, I_{AS}=3.00A, V_{DD}=50V, R_G=25ohm, Starting T_J=25°C
2. Pulse width≤300us, Duty cycle≤2%
3. Essentially independent of operating temperature typical characteristics.
4. Guaranteed by design, not subject to production testing

TYPICAL CHARACTERISTIC CURVES

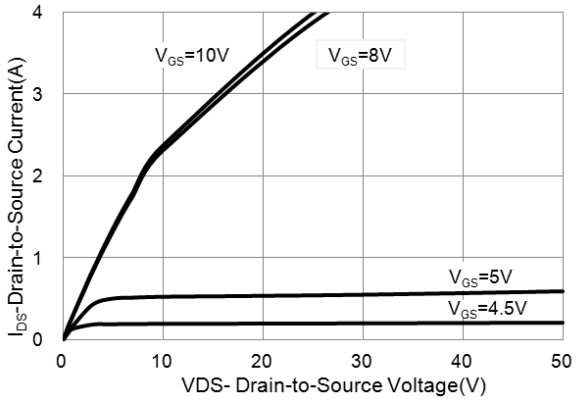


Fig.1 Output Characteristics

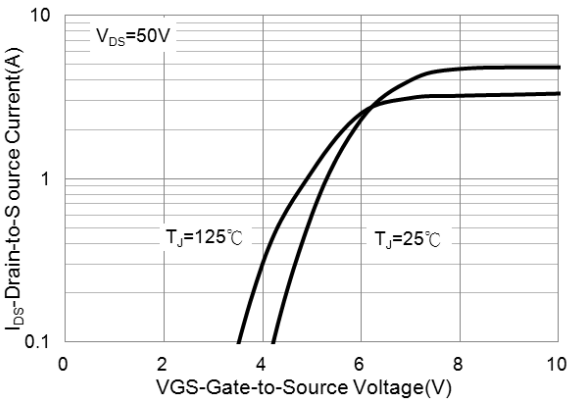


Fig.2 Transfer Characteristics

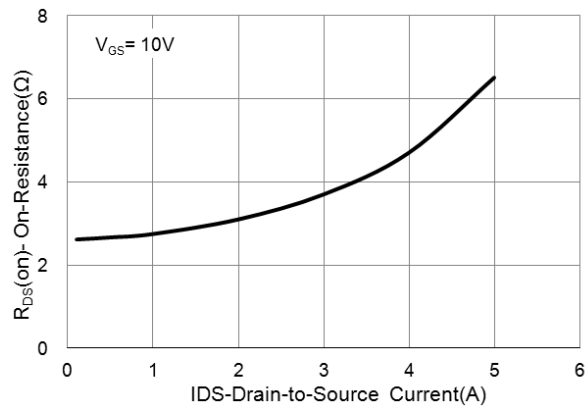


Fig.3 On-Resistance vs. Drain Current

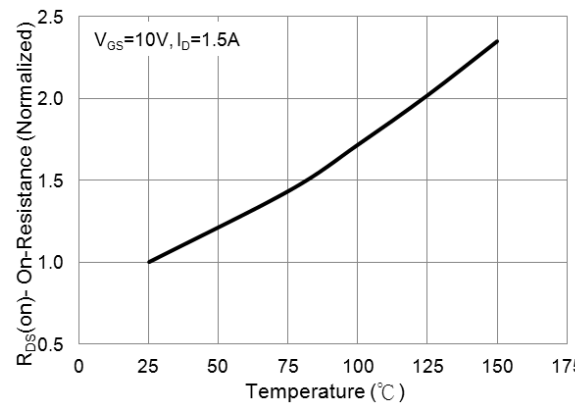


Fig.4 On-Resistsnce vs. Junction temperature

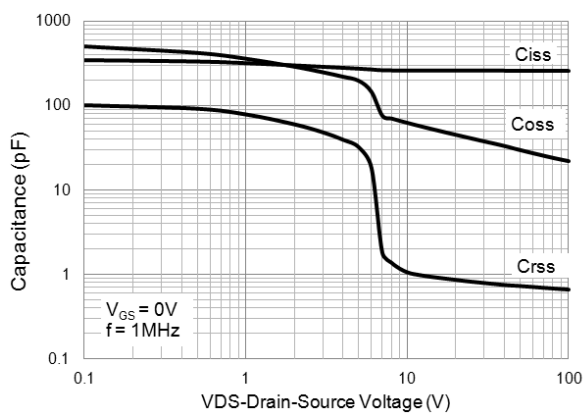


Fig.5 Capacitance vs. Drain-Source Voltage

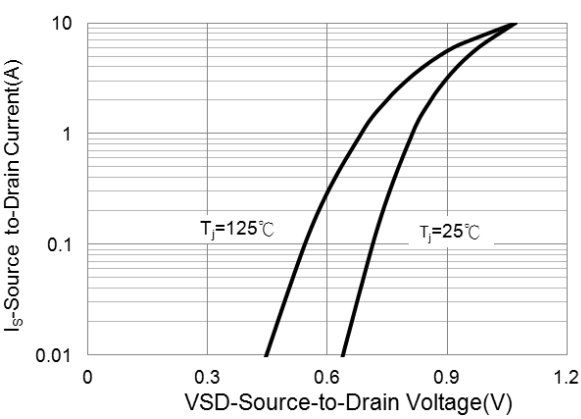


Fig.6 Body Dlode CharacterIslcs

TYPICAL CHARACTERISTIC CURVES

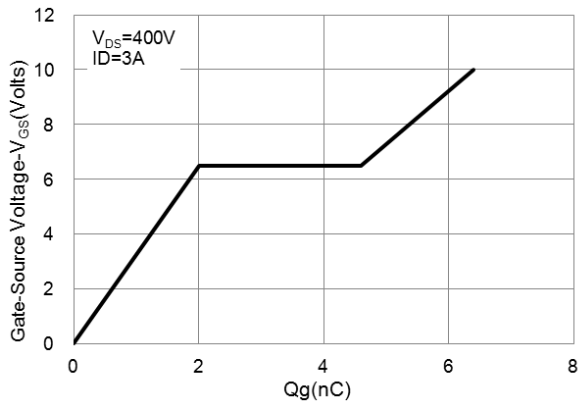
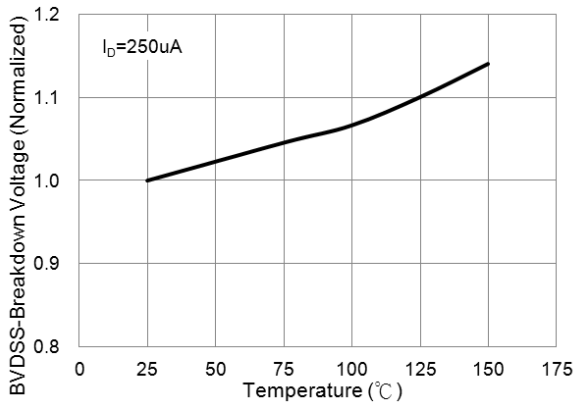
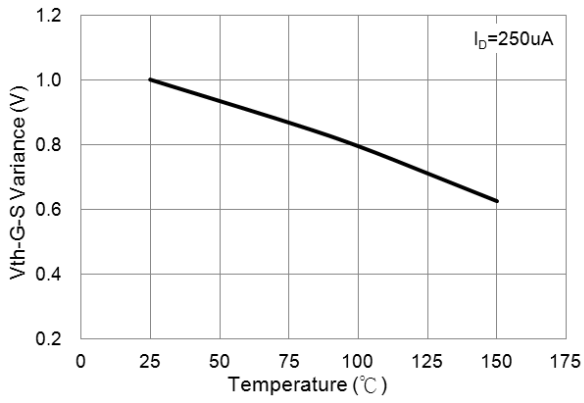


Fig.7 Gate-Charge Characteristics



Breakdown Voltage Variation vs.Temperature



Threshold Voltage Variation with Temperature

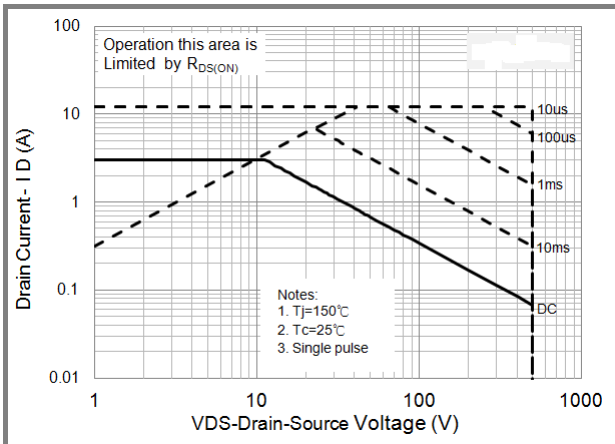
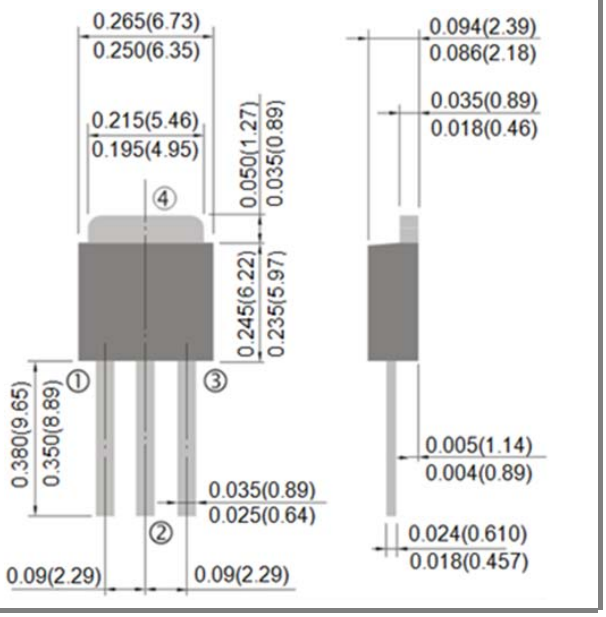


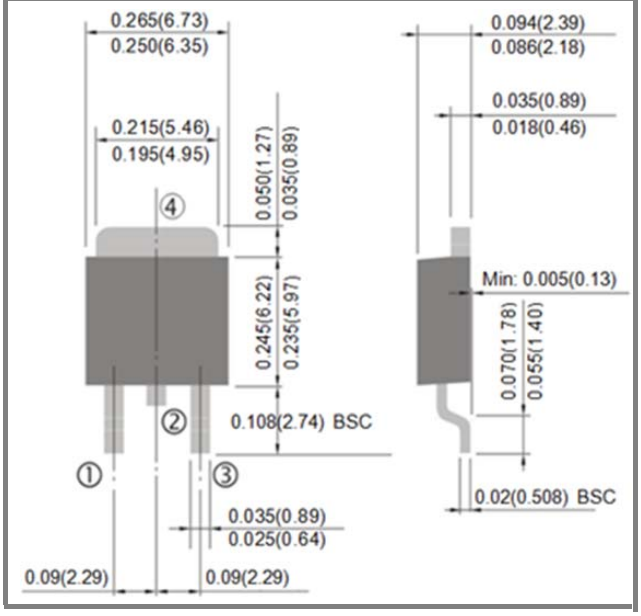
Fig.10 Maximum Safe Operating Area

Packaging Information

TO-251 Dimension — Unit: mm

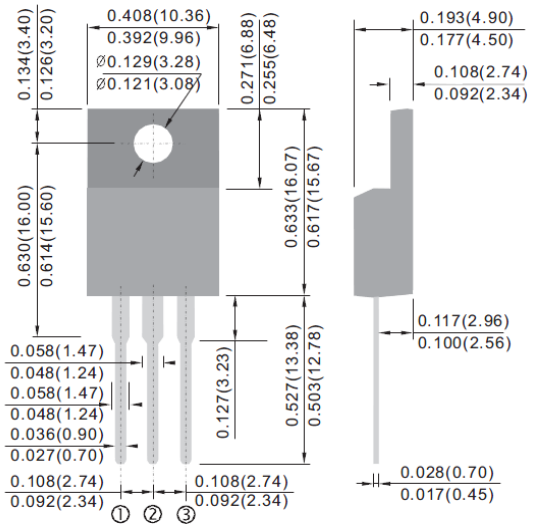


TO-252 Dimension — Unit: mm



Packaging Information .

TO-220F Dimension — Unit: mm



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