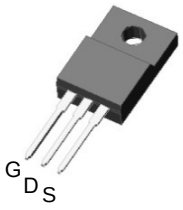
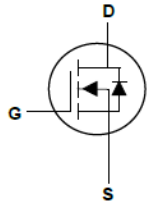
N-Channel Enhancement Mode MOSFET

Features

- Fast switching speed
- Reliable and Rugged
- ROHS Compliant
- 100% UIS and Rg Tested

Pin Description

TO-220F	Symbol
	

Applications

- Switch Mode Power Supply (SMPS)
- Uninterruptible Power Supply (UPS)
- Power Factor Correction (PFC)
- AC to DC Converters

V_{DSS}	800	V
$R_{DS(ON)-Typ}$	1370	mΩ
I_D	7	A

Absolute Maximum Ratings(T_J=25℃, Unless Otherwise Noted)

Symbol	Parameter		N-Channel	Unit
V_{DSS}	Drain-Source Voltage		800	V
V_{GSS}	Gate-Source Voltage		±30	V
T_J	Maximum Junction Temperature		-55 to 150	℃
T_{STG}	Storage Temperature Range		-55 to 150	℃
E_{AS}	Single Pulse Avalanche Energy[3]		245	mJ
I_{DM} ①	Pulse Drain Current Tested		28	A
I_D	Continuous Drain Current	T_C=25°C	7	A
P_D	Maximum Power Dissipation	T_C=25°C	45	W

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient[1] （Max）	62.5	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	2.77	℃/W

Note ①：Max. current is limited by bonding wire.

Note ②：UIS tested and pulse width are limited by maximum junction temperature 150℃.

Note ③：Surface Mounted on 1in^2 FR-4 board with 1oz.

Electrical Characteristics (T_J=25℃, Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Static Electrical Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	800	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=800V, V_{GS}=0V	---	---	25	uA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS} , I_D=250uA	2	---	4	V
I_{GSS}	Gate Leakage Current	V_{GS}=±30V, V_{DS}=0V	---	---	±100	nA
$R_{DS(ON)}$	Drain-Source On-state Resistance	V_{GS}=10V , I_D=3.5A	---	1370	1500	mΩ
gfs	Forward Transconductance	V_{DS}=15V, I_{DS}=3.5A	---	6	---	S
Dynamic Characteristics⑤						
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=25V, Freq.=1MHz	---	1400	---	pF
C_{oss}	Output Capacitance		---	1160	---	
C_{rss}	Reverse Transfer Capacitance		---	554	---	
$T_{d(on)}$	Turn-on Delay Time	V_{DD}=400V ,R_G=4.7Ω, I_D=7A,V_{GS}=10V	---	15	---	nS
T_r	Turn-on Rise Time		---	25	---	
$T_{d(off)}$	Turn-off Delay Time		---	51	---	
T_f	Turn-off Fall Time		---	31	---	
Q_g	Total Gate Charge	V_{DD}=640V , V_{GS}=10V , I_D=7A	---	47	---	nC
Q_{gs}	Gate-Source Charge		---	8.1	---	
Q_{gd}	Gate-Drain Charge		---	24.5	---	
Source-Drain Characteristics （T_J=25℃）						
V_{SD}	Diode Forward Voltage②	V_{GS}=0V , I_S=7A ,T_J=25℃	---	---	1.5	V
t_{rr}	Reverse Recovery Time	I_F=7A，V_{GS}=0V di/dt=100A/μs，T_J=25℃	---	186	---	nS
Q_{rr}	Reverse Recovery Charge		---	878	---	nC

Note ④： Pulse test (pulse width≤300us, duty cycle≤2%).

Note ⑤：Guaranteed by design, not subject to production testing.

N-Channel Enhancement Mode MOSFET

Typical Characteristics

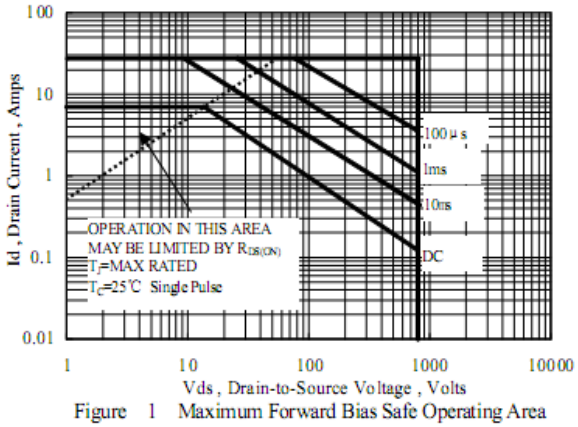


Figure 1 Maximum Forward Bias Safe Operating Area

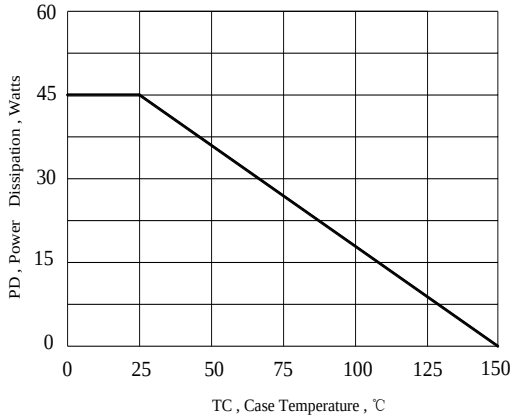


Figure 2 , Maximum Power Dissipation vs Case Temperature

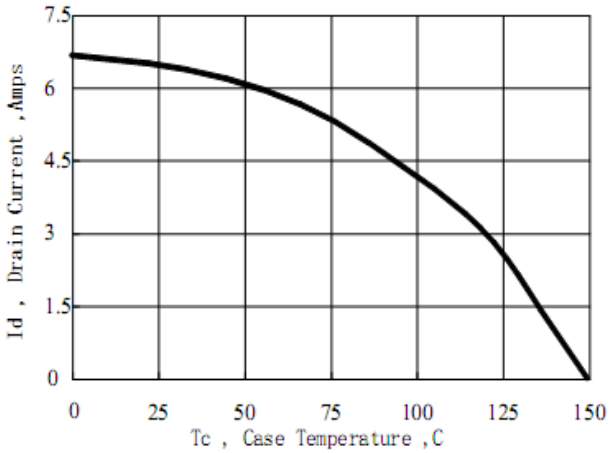


Figure 3 Maximum Continuous Drain Current vs Case Temperature

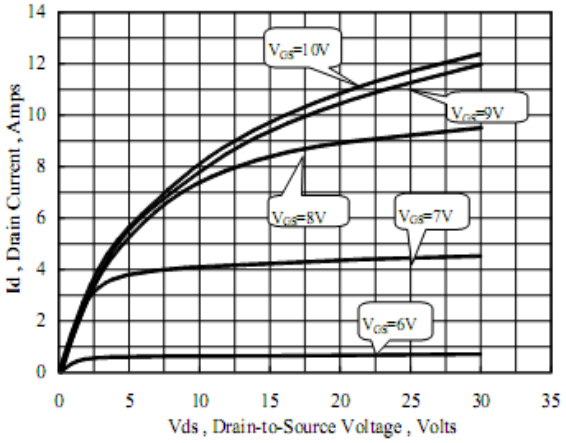


Figure 4 Typical Output Characteristics

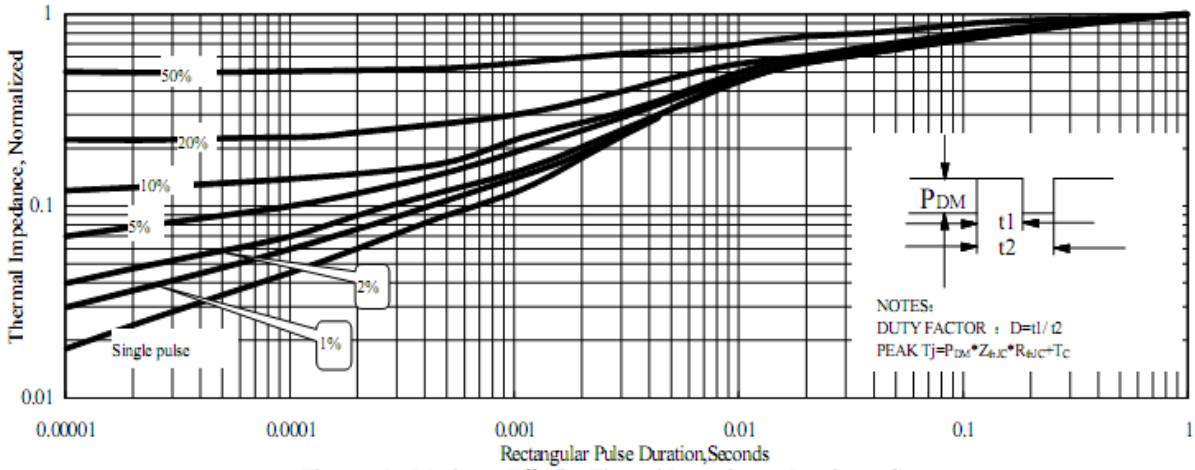


Figure 5 Maximum Effective Thermal Impendance , Junction to Case

N-Channel Enhancement Mode MOSFET

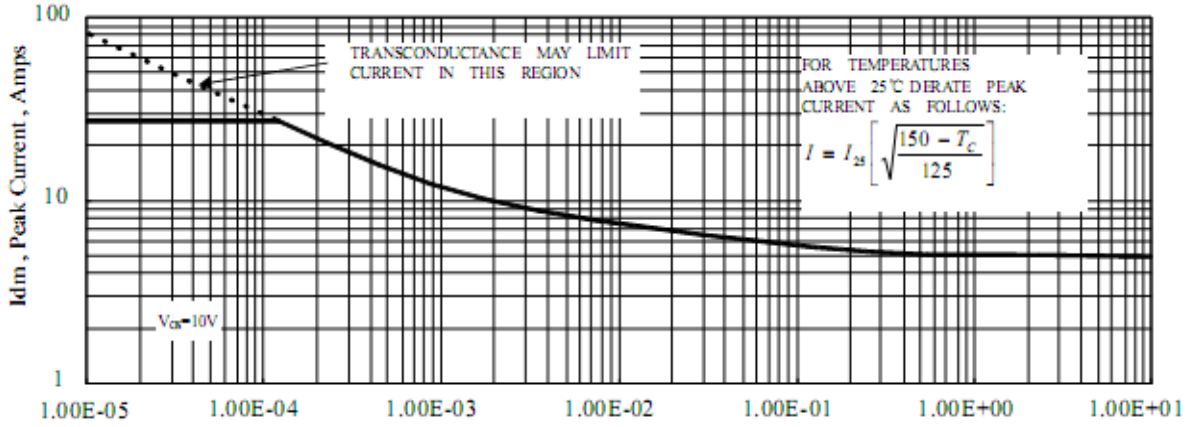


Figure 6 Maximum Peak Current Capability

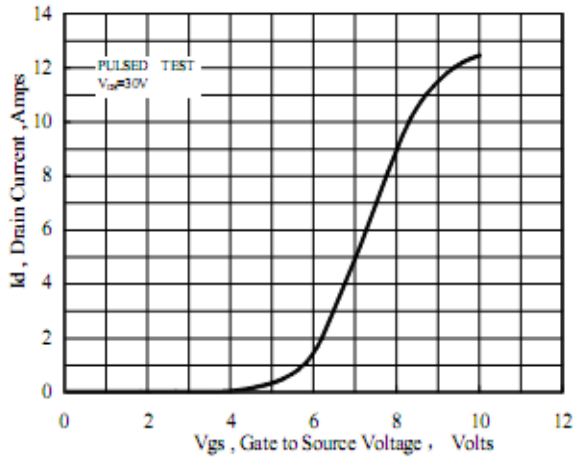


Figure 7 Typical Transfer Characteristics

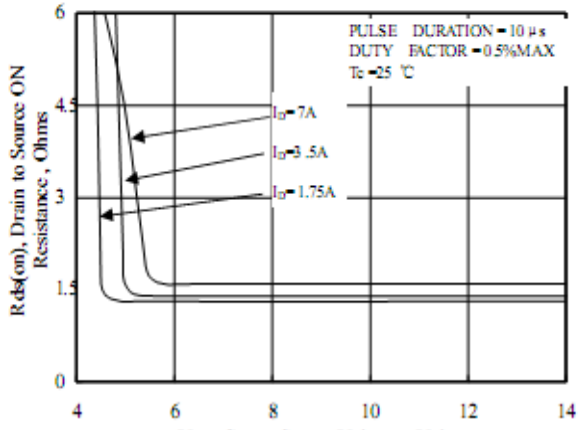


Figure 8 Typical Drain to Source ON Resistance vs Gate Voltage and Drain Current

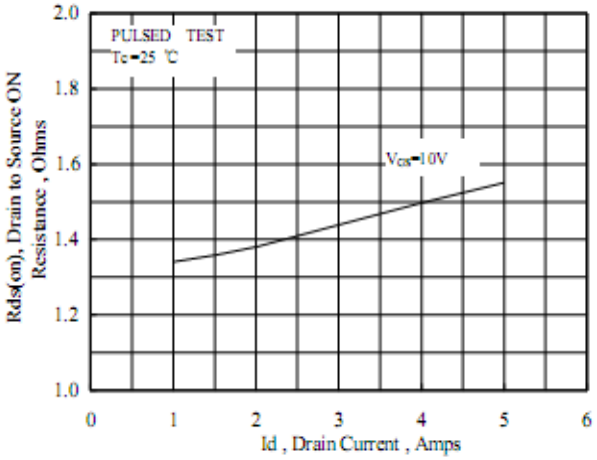


Figure 9 Typical Drain to Source ON Resistance vs Drain Current

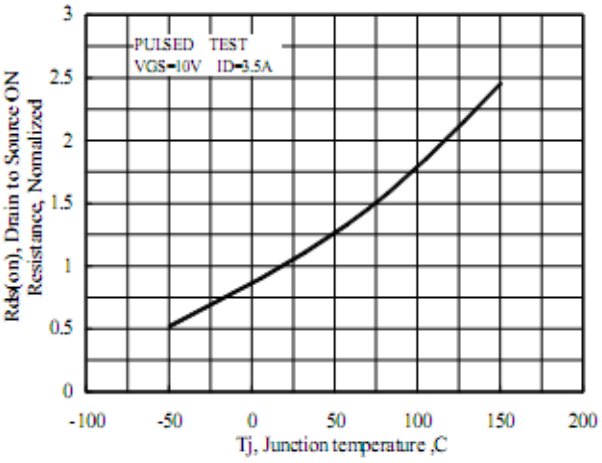


Figure 10 Typical Drian to Source on Resistance vs Junction Temperature

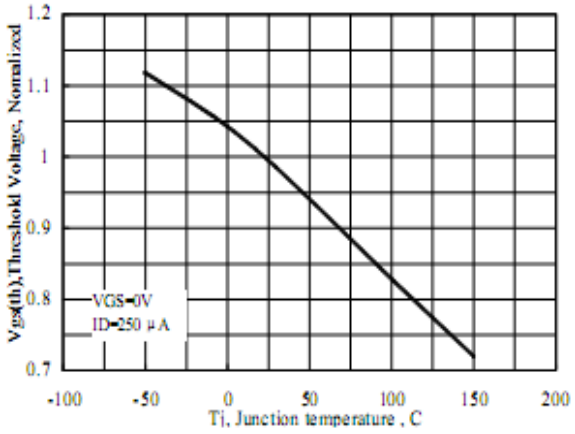


Figure 11 Typical Theshold Voltage vs Junction Temperature

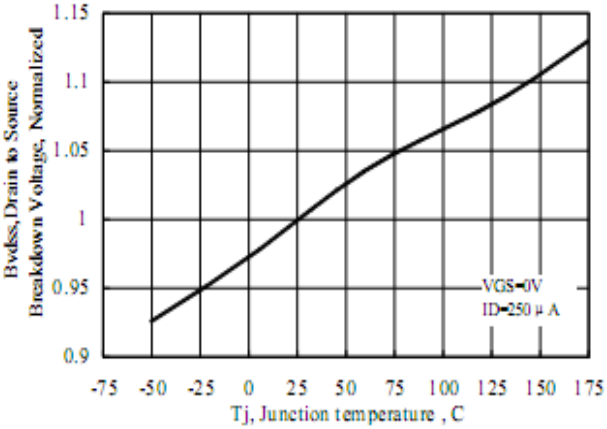


Figure 12 Typical Breakdown Voltage vs Junction Temperature

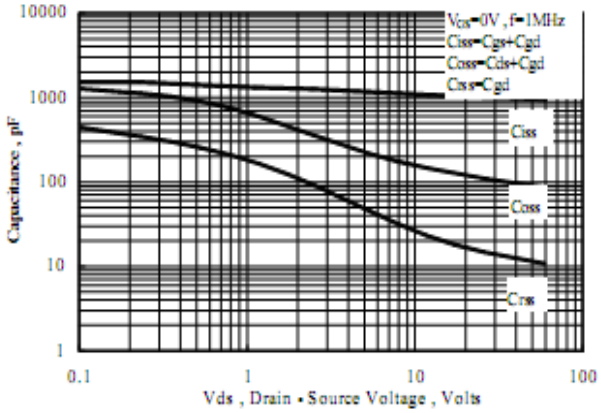


Figure 13 Typical Capacitance vs Drain to Source Voltage

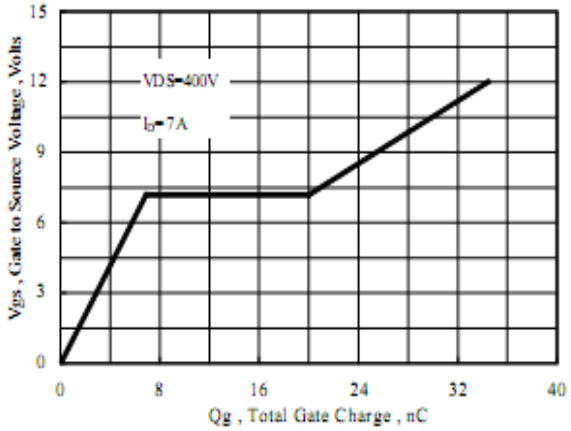


Figure 14 Typical Gate Charge vs Gate to Source Voltage

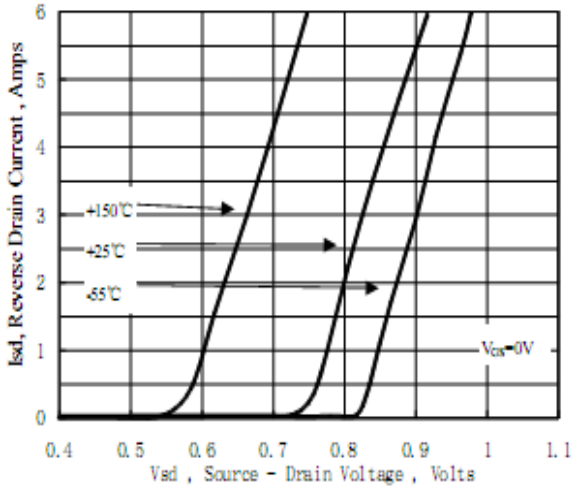


Figure 15 Typical Body Diode Transfer Characteristics

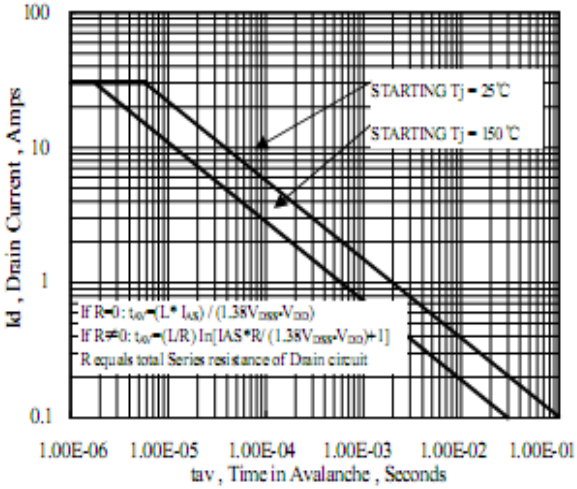


Figure 16 Unclamped Inductive Switching Capability

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TO-220F Package Outline Data