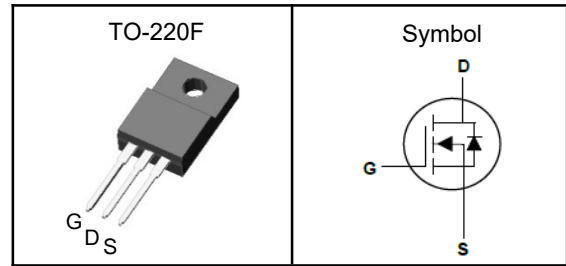


700V Super Junction Power MOSFET
Features

- Low drain-source on-resistance: $R_{DS(ON)}=0.87\Omega(\text{typ})$
- Easy to control gate switching
- Enhancement mode: $V_{th} = 2$ to 4 V
- 100% avalanche tested
- RoHS compliant

Applications

- Switch Mode Power Supply (SMPS)
- Uninterruptible Power Supply (UPS)
- Power Factor Correction (PFC)
- Charger, Lighting

Pin Description


V_{DSS}	700	V
$R_{DS(ON)-Typ}$	870	m Ω
I_D	6	A

Absolute Maximum Ratings ($T_J=25^\circ\text{C}$, Unless Otherwise Noted)

Symbol	Parameter	Rating	Unit
V_{DSS}	Drain-Source Voltage	700	V
V_{GSS}	Gate-Source Voltage	± 30	V
T_J	Maximum Junction Temperature	-55 to 150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
E_{AS}	Single Pulse Avalanche Energy ³	36	mJ
$I_{DM}^{①}$	Pulse Drain Current Tested	18	A
I_D	Continuous Drain Current	$T_c=25^\circ\text{C}$	A
P_D	Maximum Power Dissipation	$T_c=25^\circ\text{C}$	W

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	80	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	4.9	$^\circ\text{C}/\text{W}$

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

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

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



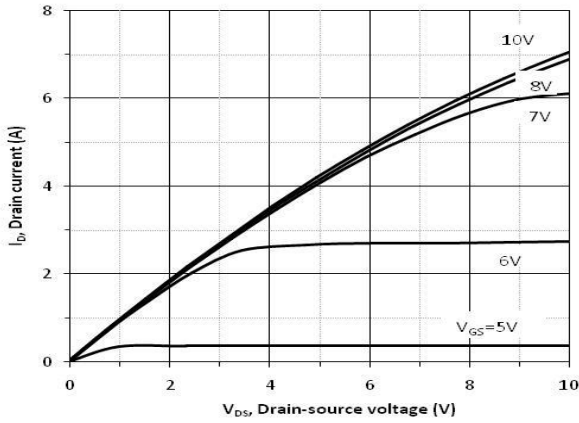
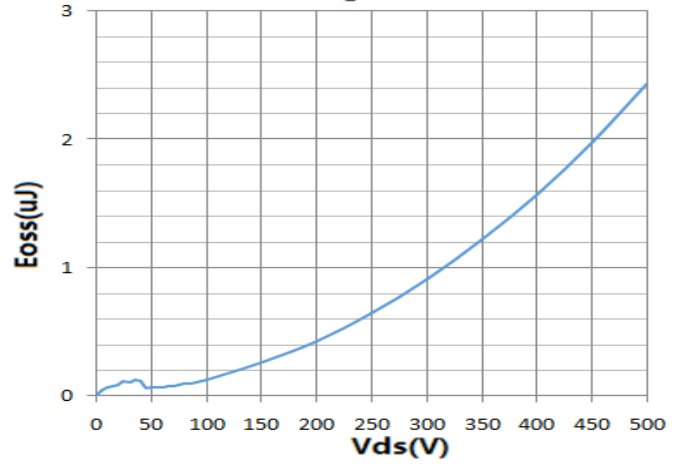
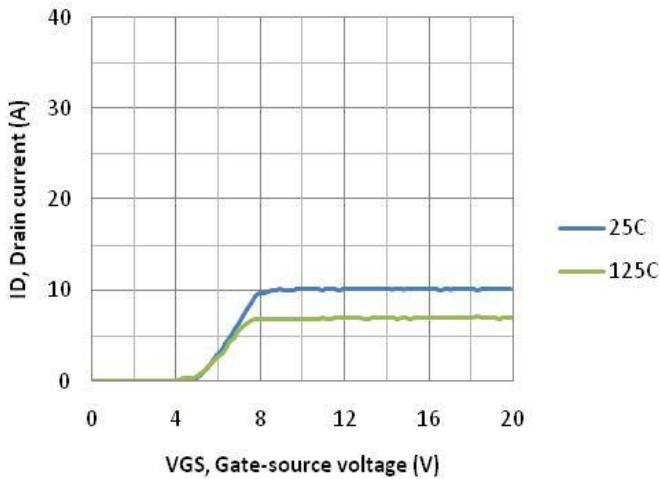
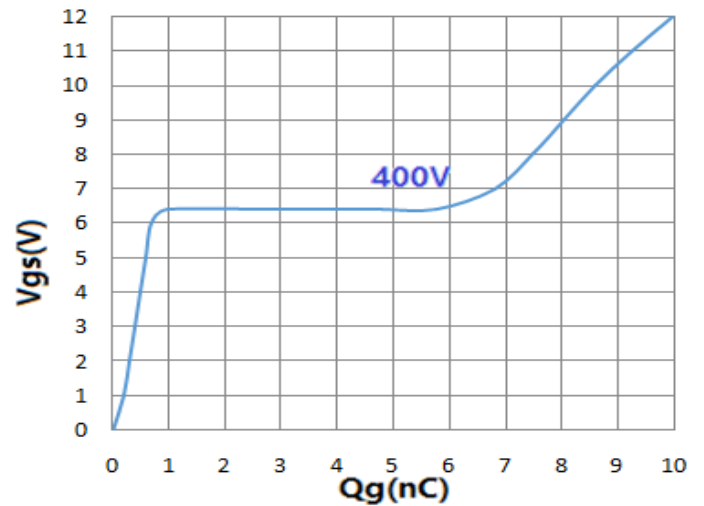
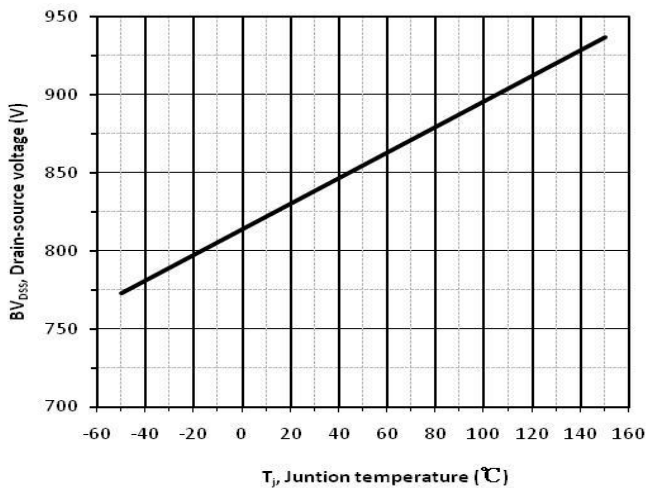
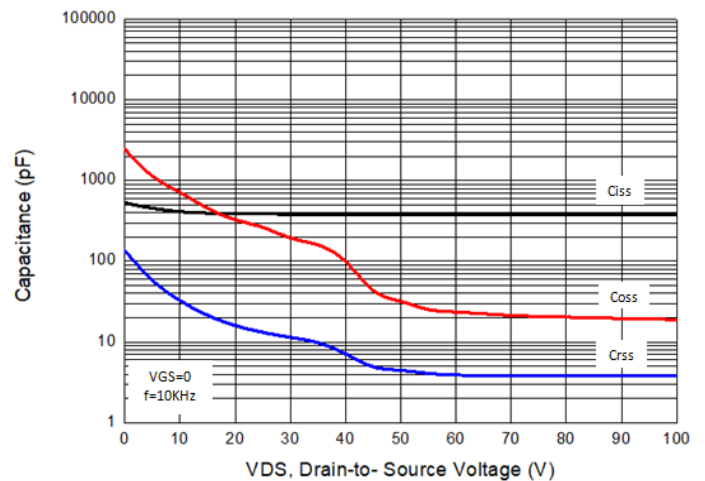
700V Super Junction Power MOSFET

Electrical Characteristics ($T_J=25^{\circ}\text{C}$, Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Static Electrical Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=10mA$	700	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=700V, V_{GS}=0V$	---	---	0.1	μA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2	---	4	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 30V, V_{DS}=0V$	---	---	± 100	nA
$R_{DS(ON)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_D=2A$	---	870	950	m Ω
Dynamic Characteristics ^⑤						
C_{iss}	Input Capacitance	$V_{DS}=50V,$ $V_{GS}=0V,$ Freq.=1MHz	---	379	---	pF
C_{oss}	Output Capacitance		---	33	---	
C_{rss}	Reverse Transfer Capacitance		---	4.55	---	
$T_{d(on)}$	Turn-on Delay Time	$V_{DS}=400V, V_{GS}=10V,$ $I_D=2.5A, R_G=6.8\Omega$	---	8.4	---	nS
T_r	Turn-on Rise Time		---	21.6	---	
$T_{d(off)}$	Turn-off Delay Time		---	45.2	---	
T_f	Turn-off Fall Time		---	24.4	---	
Q_g	Total Gate Charge	$V_{DS}=400V, V_{GS}=10V,$ $I_D=2.5A$	---	10	---	nC
Q_{gs}	Gate-Source Charge		---	1.8	---	
Q_{gd}	Gate-Drain Charge		---	2.7	---	
Source-Drain Characteristics						
V_{SD}	Diode Forward Voltage	$I_f=1A, V_{GS}=0V$	---	0.77	---	V
t_{rr}	Reverse Recovery Time	$I_f=2.5A, V_{GS}=0V,$ $di_f/dt=100A/\mu s$	---	124	---	nS
Q_{rr}	Reverse Recovery Charge		---	0.88	---	nC
I_{rrm}	Peak reverse recovery current		---	10	---	A

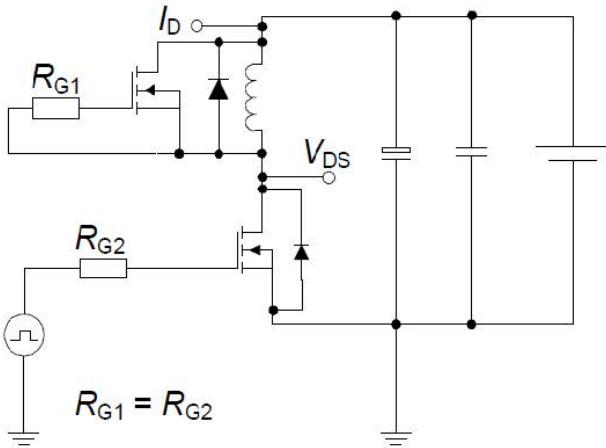
Note ④ : Pulse test (pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$).

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

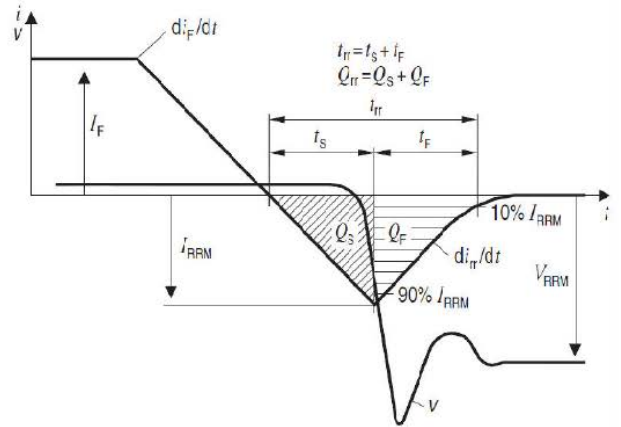
700V Super Junction Power MOSFET
Typical Characteristics
Diagram 1: Typ. output characteristics

Diagram 2: Typ. Coss stored energy

Diagram 3: Typ. transfer characteristics

Diagram 4: Typ. gate charge

Diagram 5: Drain-source breakdown voltage

Diagram 6: Typ. capacitances


700V Super Junction Power MOSFET
Table 7 Diode characteristics

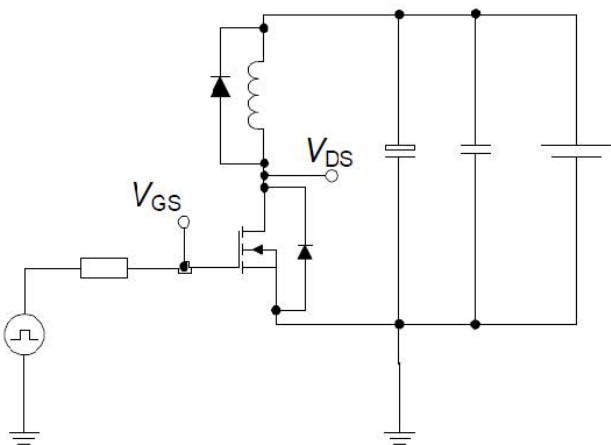
Test circuit for diode characteristics



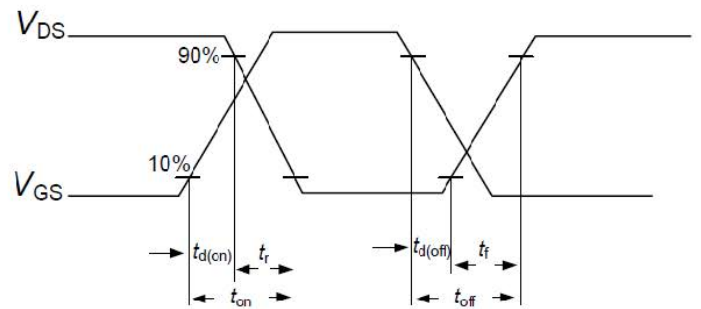
Diode recovery waveform


Table 8 Switching times

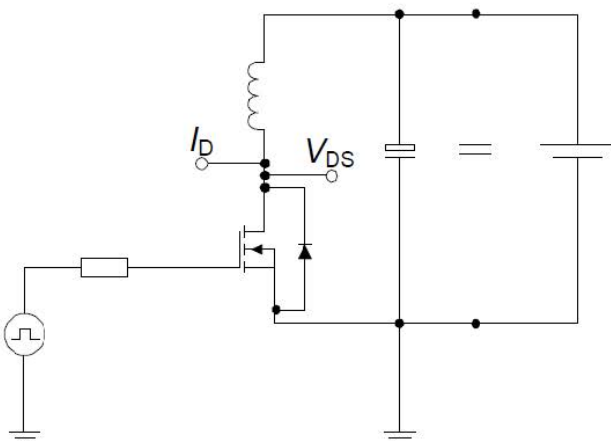
Switching times test circuit for inductive load



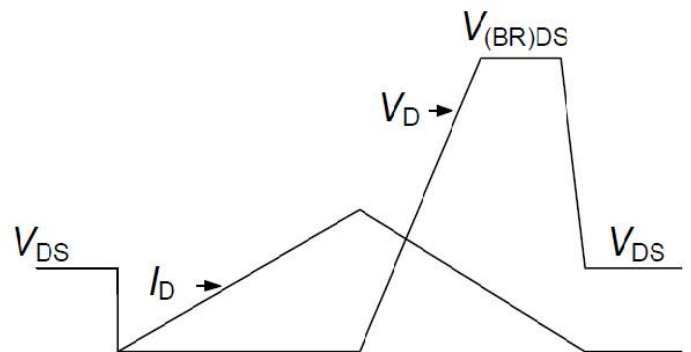
Switching times waveform


Table 9 Unclamped inductive load

Unclamped inductive load test circuit



Unclamped inductive waveform



700V Super Junction Power MOSFET
TO-220F Package Outline Data
