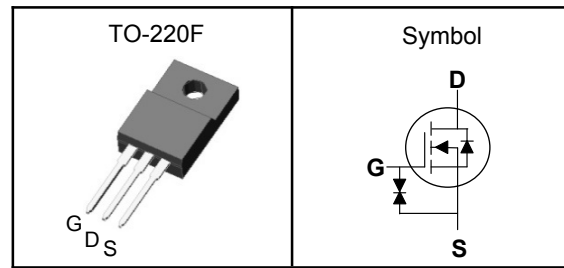


800V Super Junction Power MOSFET

Features

- Low drain-source on-resistance: $R_{DS(ON)}=0.33\Omega$ (typ)
- Easy to control gate switching
- Enhancement mode: $V_{th} = 2.0$ to $4.0V$
- 100% avalanche tested
- Built-in ESD Diode
- RoHS compliant

Pin Description



Applications

- Power Management in Desktop Computer
- DC/DC Converters

V_{DSS}	800	V
$R_{DS(ON)-Typ}$	330	m Ω
I_D	13	A

Absolute Maximum Ratings ($T_J=25^\circ C$, 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	$^\circ C$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
E_{AS}	Single Pulse Avalanche Energy ³	320	mJ
$I_{DM}^{①}$	Pulse Drain Current Tested	39	A
I_D	Continuous Drain Current	$T_c=25^\circ C$	A
P_D	Maximum Power Dissipation	$T_c=25^\circ C$	W

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹ (Max)	80	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	3.87	$^\circ C/W$

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

Note ② : UIS tested and pulse width are limited by maximum junction temperature $150^\circ C$.

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

**800V 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	$V_{GS}=0V, I_D=250\mu A$	800	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=800V, V_{GS}=0V$	---	---	1	μA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	---	4.0	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 30V, V_{DS}=0V$	---	---	± 100	nA
$R_{DS(on)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_D=3.4A$	---	330	380	m Ω
Dynamic Characteristics ^⑤						
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=500V,$ Freq.=1MHz	---	1230	---	pF
C_{oss}	Output Capacitance		---	26	---	
C_{rss}	Reverse Transfer Capacitance		---	3.3	---	
$T_{d(on)}$	Turn-on Delay Time	$V_{DD}=400V, R_G=25\Omega,$ $I_D=6.2A$	---	29	---	nS
T_r	Turn-on Rise Time		---	20	---	
$T_{d(off)}$	Turn-off Delay Time		---	135	---	
T_f	Turn-off Fall Time		---	17	---	
Q_g	Total Gate Charge	$V_{DD}=640V, V_{GS}=10V,$ $I_D=6.2A$	---	29	---	nC
Q_{gs}	Gate-Source Charge		---	5.2	---	
Q_{gd}	Gate-Drain Charge		---	8.8	---	
Source-Drain Characteristics ($T_J=25^\circ\text{C}$)						
V_{SD}	Diode Forward Voltage _z	$V_{GS}=0V,$ $I_S=6.2A, T_J=25^\circ\text{C}$	---	---	1.3	V
t_{rr}	Reverse Recovery Time	$V_R=400V, I_S=6.2A,$ $di/dt=100A/\mu s, T_J=25^\circ\text{C}$	---	360	---	nS
Q_{rr}	Reverse Recovery Charge		---	3.8	---	nC

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

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

800V Super Junction Power MOSFET

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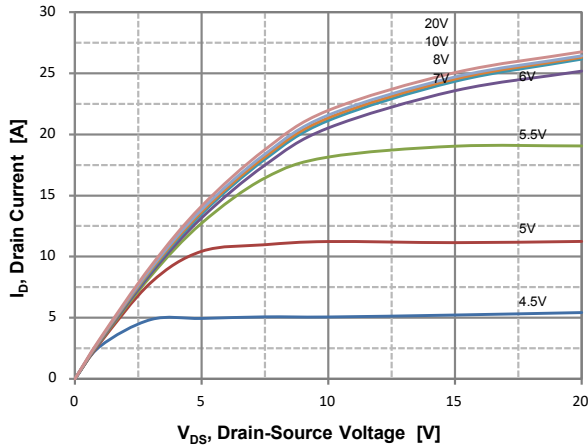


Figure 1. On Region Characteristics

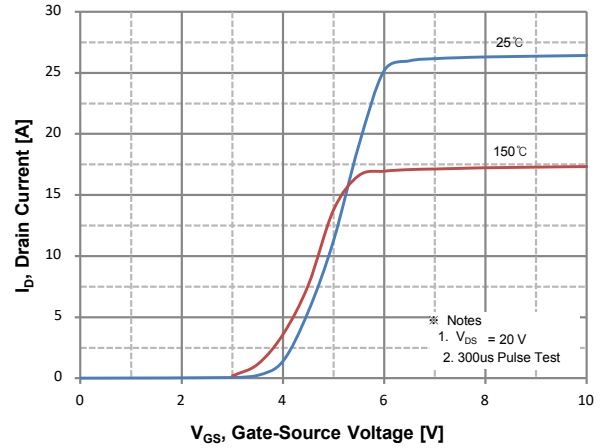


Figure 2. Transfer Characteristics

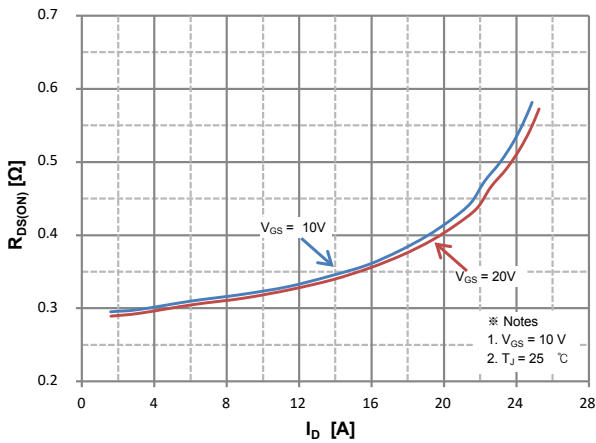


Figure 3. On Resistance Variation vs Drain Current and Gate Voltage

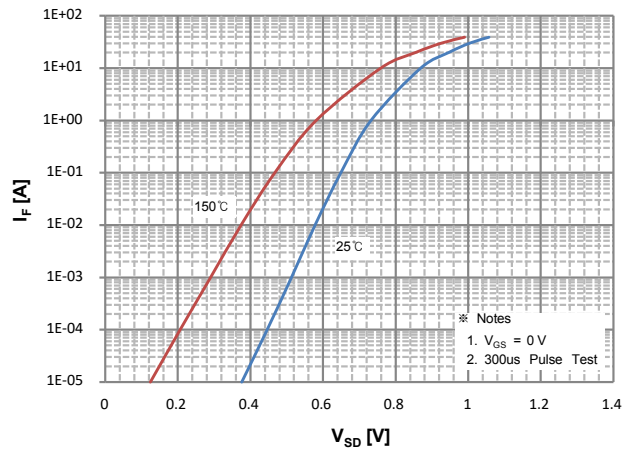


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

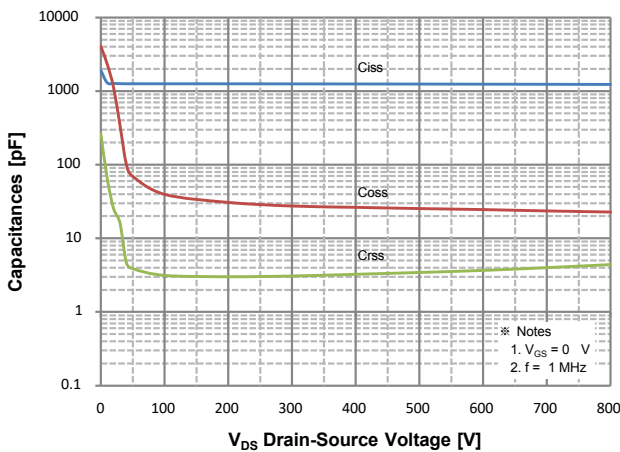


Figure 5. Capacitance Characteristics

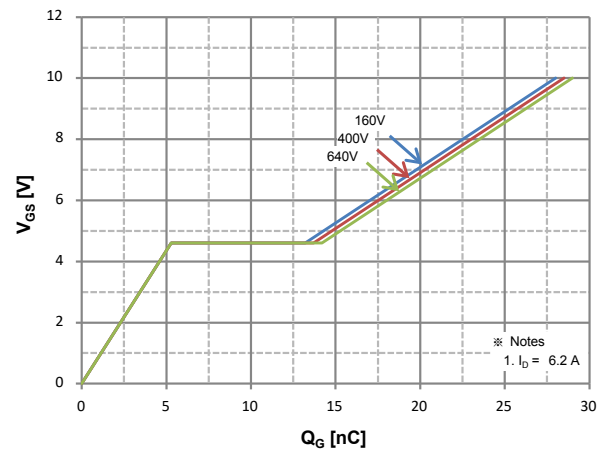
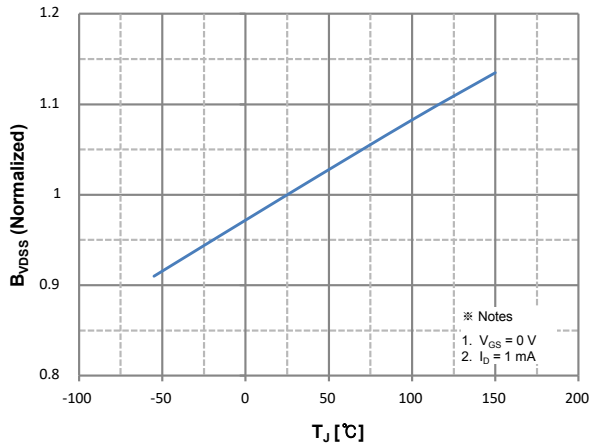
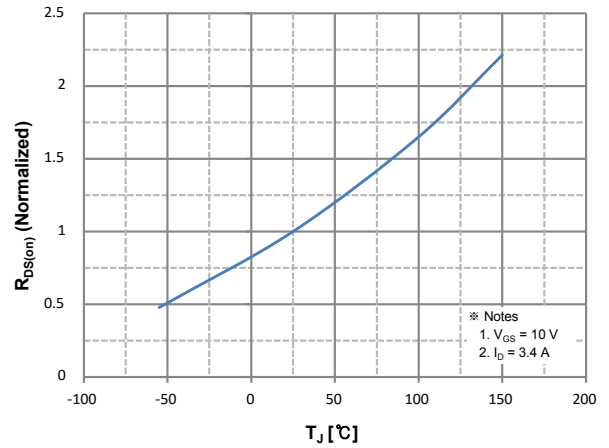
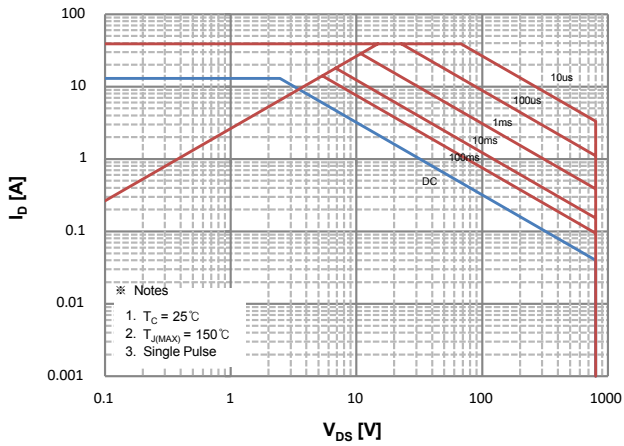
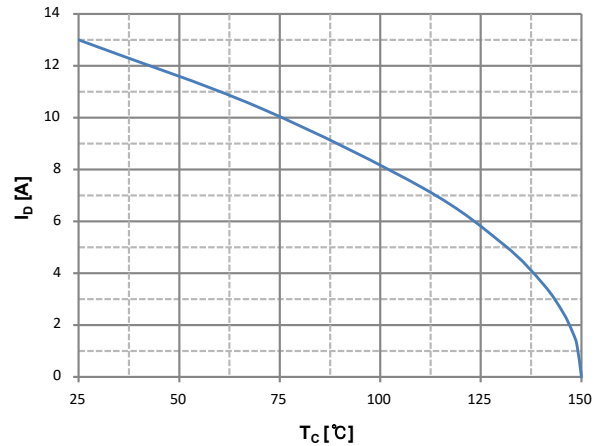
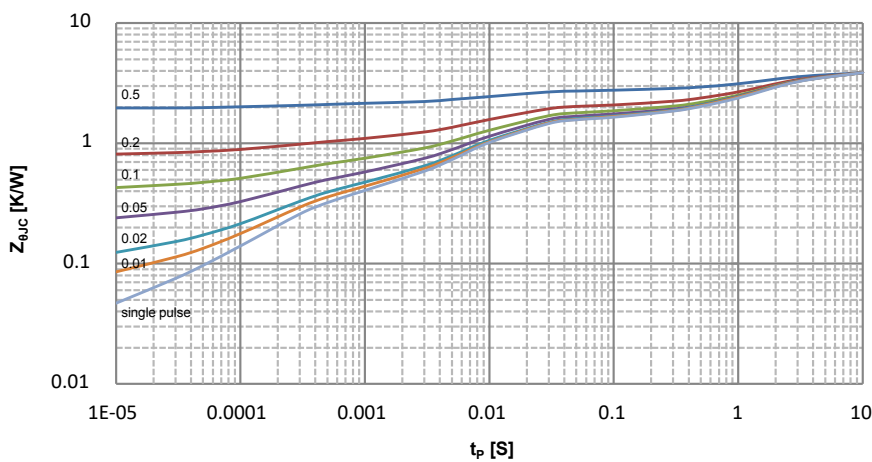


Figure 6. Gate Charge Characteristics

800V Super Junction Power MOSFET

Figure 7. Breakdown Voltage Variation vs. Temperature

Figure 8. On-Resistance Variation vs. Temperature

Figure 9. Maximum Safe Operating Area

Figure 10. Maximum Drain Current vs. Case Temperature

Figure 11. Transient Thermal Response Curve

800V Super Junction Power MOSFET
TO-220F Package Outline Data
