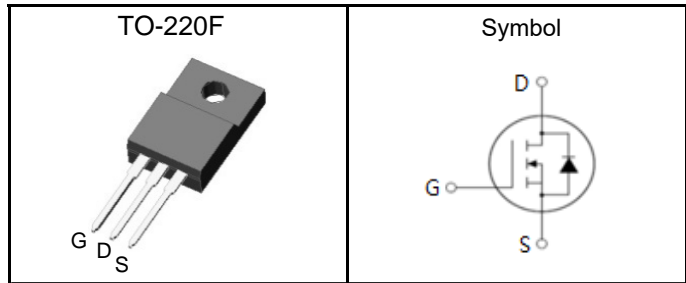


800V N Channel Super Junction MOSFET

Features

- $BV_{DSS}=800\text{ V}$, $I_D=8.0\text{ A}$
- $R_{DS(on)}:0.65\Omega$ (Max) @ $V_{GS}=10\text{ V}$
- Very Low FOM ($R_{DS(on)} \times Q_g$)
- Extremely low switching loss
- Excellent stability and uniformity
- 100% Avalanche Tested



Application

- Switch Mode Power Supply (SMPS)
- Uninterruptible Power Supply (UPS)
- Power Factor Correction (PFC)
- TV power & LED Lighting Power
- AC to DC Converters

Absolute Maximum Ratings $T_C=25^\circ\text{C}$ unless otherwise specified

Symbol	Parameter	Value	Unit
V_{DSS}	Drain-Source Voltage	800	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current - Continuous ($T_C = 25^\circ\text{C}$)	8.0 *	A
	Drain Current - Continuous ($T_C = 100^\circ\text{C}$)	5.1 *	A
$I_{DM}^{(1)}$	Drain Current - Pulsed	24 *	A
$E_{AS}^{(2)}$	Single Pulsed Avalanche Energy	200	mJ
I_{AR}	Avalanche Current	6.3	A
dv/dt	MOSFET dv/dt ruggedness, $V_{DS}=0\dots 400\text{ V}$	50	V/ns
dv/dt	Reverse diode dv/dt, $V_{DS}=0\dots 400\text{ V}$, $I_{DS}\leq I_D$	15	V/ns
P_D	Power Dissipation ($T_C = 25^\circ\text{C}$)	29	W
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150	$^\circ\text{C}$

* Drain current limited by maximum junction temperature

Thermal Resistance Characteristics

Symbol	Parameter	Value	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case, Max.	4.34	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient, Max.	80	$^\circ\text{C/W}$



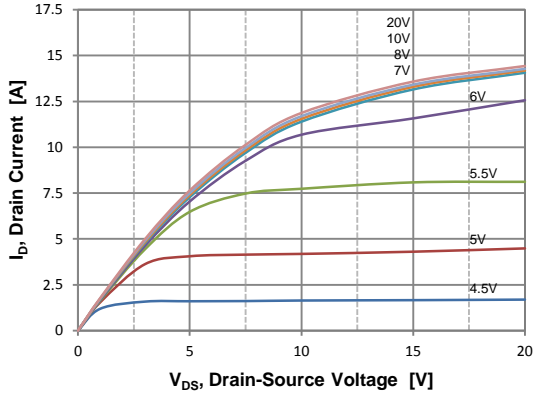
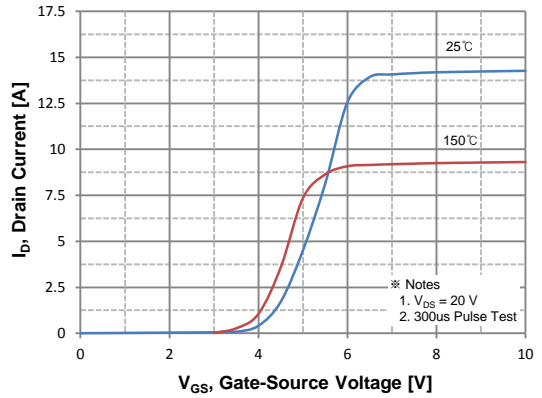
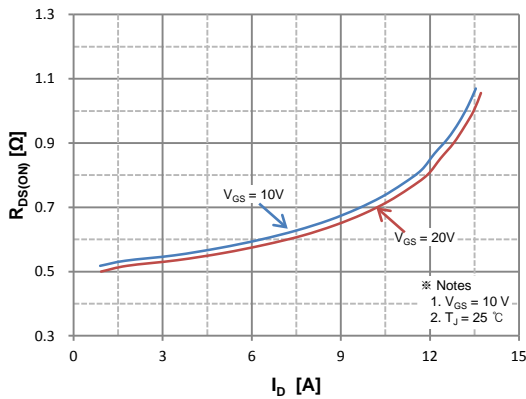
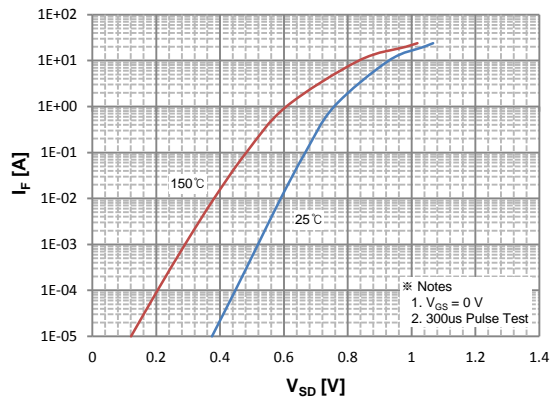
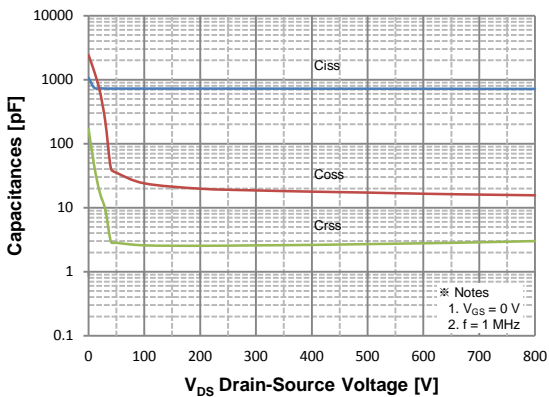
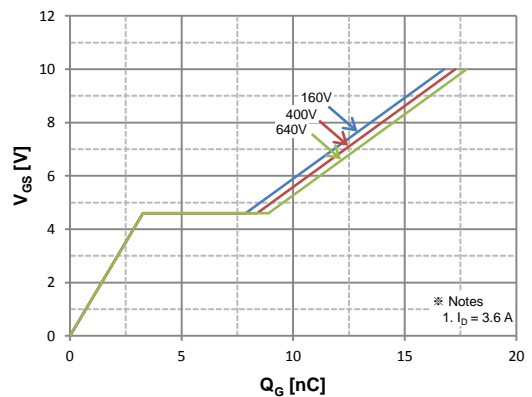
800V N Channel Super Junction MOSFET

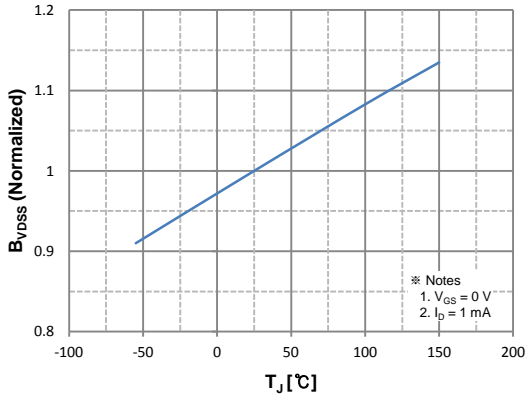
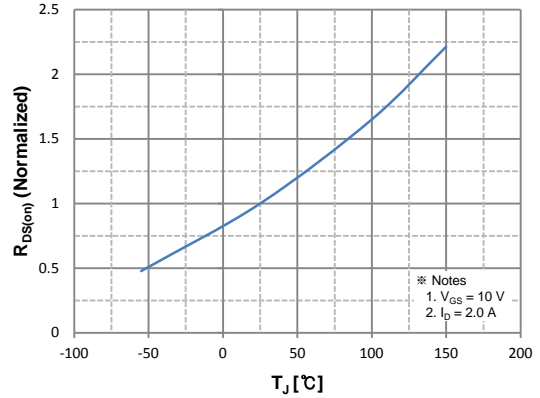
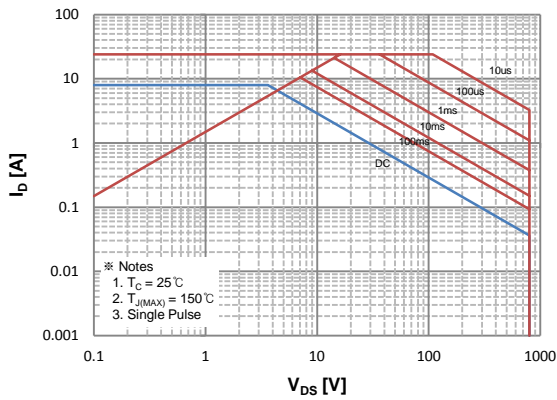
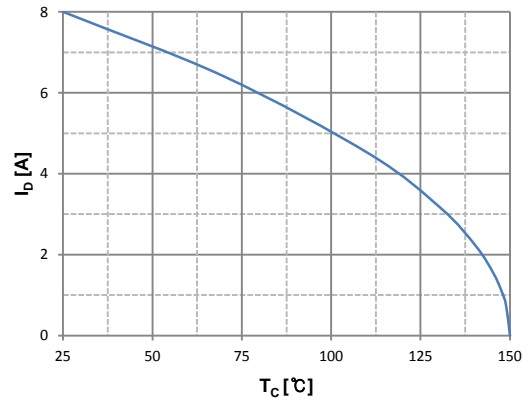
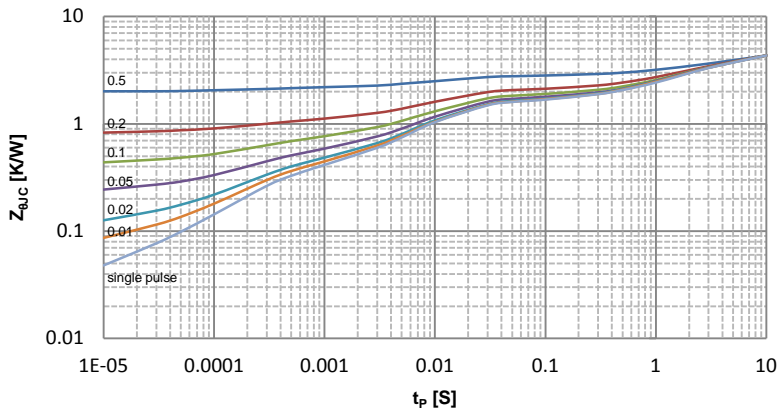
Electrical Characteristics $T_J=25^\circ\text{C}$ unless otherwise specified

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
On Characteristics						
V_{GS}	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250 \mu\text{A}$	2.5	-	4.5	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS} = 10 \text{ V}, I_D = 2.0 \text{ A}$	-	0.56	0.65	Ω
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0 \text{ V}, I_D = 1\text{mA}$	800	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 800 \text{ V}, V_{GS} = 0$	-	-	1	μA
		$V_{DS} = 800 \text{ V}, T_C = 150^\circ\text{C}$	-	-	100	μA
I_{GSS}	Gate-Body Leakage Current	$V_{GS} = \pm 20 \text{ V}, V_{DS} = 0 \text{ V}$	-	-	± 1	μA
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS} = 500 \text{ V}, V_{GS} = 0 \text{ V}, f = 1.0 \text{ MHz}$	-	725	-	pF
C_{oss}	Output Capacitance		-	18.2	-	pF
C_{rss}	Reverse Transfer Capacitance		-	2.8	-	pF
Switching Characteristics						
$t_{d(on)}$	Turn-On Time	$V_{DS} = 400 \text{ V}, I_D = 3.6 \text{ A}, R_G = 25 \Omega$	-	23	-	ns
t_r	Turn-On Rise Time		-	20	-	ns
$t_{d(off)}$	Turn-Off Delay Time		-	91	-	ns
t_f	Turn-Off Fall Time		-	17	-	ns
Q_g	Total Gate Charge	$V_{DS} = 640 \text{ V}, I_D = 3.6 \text{ A}, V_{GS} = 10 \text{ V}$	-	18	-	nC
Q_{gs}	Gate-Source Charge		-	3.4	-	nC
Q_{gd}	Gate-Drain Charge		-	5.5	-	nC
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain-Source Diode Forward Current		-	-	8	A
I_{SM}	Maximum Pulsed Drain-Source Diode Forward Current		-	-	24	A
V_{SD}	Drain-Source Diode Forward Voltage	$V_{GS} = 0 \text{ V}, I_S = 3.6 \text{ A}$	-	-	1.3	V
t_{rr}	Reverse Recovery Time	$V_R = 400 \text{ V}, I_F = 3.6 \text{ A}, di_F/dt = 100 \text{ A}/\mu\text{s}$	-	292	-	ns
Q_{rr}	Reverse Recovery Charge		-	2.2	-	μC

Notes :

1. Repetitive Rating : Pulse width limited by maximum junction temperature
2. $I_{AS}=6.3\text{A}$ $V_{DD}=50\text{V}$, $R_G=25\Omega$, Starting $T_J=25^\circ\text{C}$
3. Pulse Test : Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$
4. Essentially Independent of Operating Temperature

800V N Channel Super Junction MOSFET
Typical Characteristics

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 N Channel Super Junction MOSFET
Typical Characteristics

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 N Channel Super Junction MOSFET
TO-220F Package Outline Data

unit: mm

