

Descriptions

This is N-CHANNEL 650V Super-Junction Power MOSFET in a TO-220FL Plastic Package.

Features

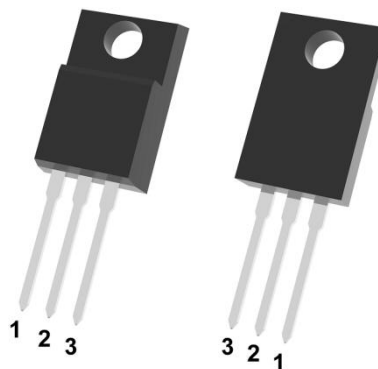
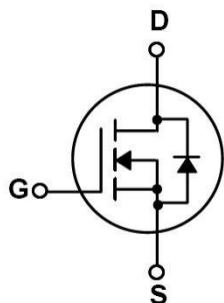
- Very low $R_{DS(on)} \times Q_g$
- 100% avalanche tested
- RoHS compliant

Parameter	Value	Unit
V_{DSS}	650	V
$R_{DS(ON)MAX. V_{GS}=10V}$	380	mΩ
I_D	11	A

Applications

- For switch mode power supply
- uninterruptible power supply
- power factor correction

Equivalent Circuit & Pinning



TO-220FL

PIN1 : G

PIN 2 : D

PIN 3 : S

Absolute Maximum Ratings(Ta=25°C)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	650	V
Drain Current	$I_D(T_c=25^\circ\text{C})$	11	A
Drain Current - Pulsed	I_{DM}	44	A
Gate-Source Voltage	V_{GS}	± 30	V
Single Pulsed Avalanche Energy	E_{AS}	243	mJ
Avalanche Current	I_{AS}	7.5	A
Power Dissipation	$P_D(T_c=25^\circ\text{C})$	27	W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to 150	°C
Junction-to-Case	$R_{\theta JC}$	4.6	°C/W
Junction-to-Ambient	$R_{\theta JA}$	65	°C/W

Electrical Characteristics(Ta=25°C)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V$ $I_D=250\mu A$	650			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=650V$ $V_{GS}=0V$ $T_J=25^\circ\text{C}$			1.0	μA
Gate-Body Leakage Current, Forward	I_{GSS}	$V_{GS}=\pm 30V$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=250\mu A$	2.5	3.3	4.0	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V$ $I_D=5.5A$		370	380	m Ω
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V$ $I_{SD}=1A$ $T_J=25^\circ\text{C}$			1.2	V
Gate Resistance	R_g	$V_{GS}=0V$ $f=1.0\text{MHz}$		9.5		Ω
Input Capacitance	C_{iss}	$V_{DS}=25V$ $f=1.0\text{MHz}$ $V_{GS}=0V$		690		pF
Output Capacitance	C_{oss}			940		pF
Reverse Transfer Capacitance	C_{rss}			11		pF
Turn-On Delay Time	$t_{d(on)}$	$V_{DS}=400V$ $R_G=25\Omega$ $I_D=5.5A$ $V_{GS}=10V$		44.8		ns
Turn-On Rise Time	t_r			19.3		ns
Turn-Off Delay Time	$t_{d(off)}$			68.3		ns
Turn-Off Fall Time	t_f			16.5		ns

Electrical Characteristics(Ta=25°C)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Continuous Diode Forward Current	I _s				11	A
Total Gate Charge	Q _g	V _{DS} =480V I _D =5.5A V _{GS} =10V		15.8		nC
Gate-Source Charge	Q _{gs}			4.3		nC
Gate-Drain Charge	Q _{gd}			1.7		nC
Reverse recovery time	T _{rr}	V _R =400 V, I _F =5.5A, dI _F /dt=100 A/μs		194.6		ns
Reverse recovery charge	Q _{rr}			1.8		uC

Electrical Characteristic Curve

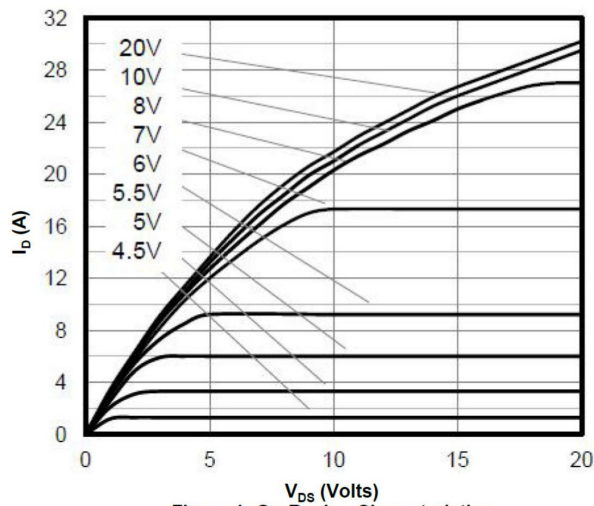


Figure 1: On-Region Characteristics

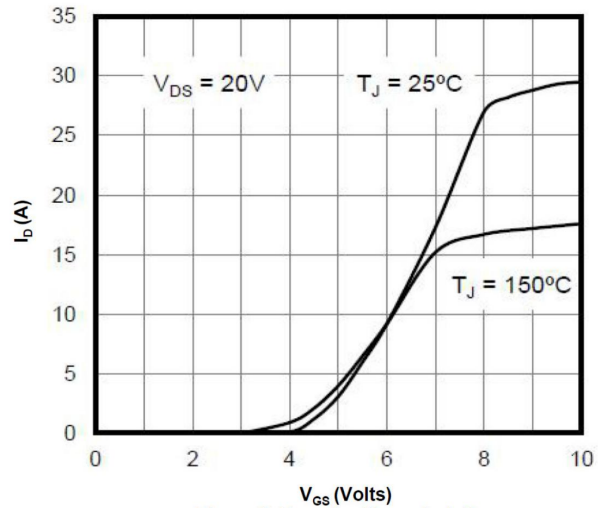


Figure 2: Transfer Characteristics

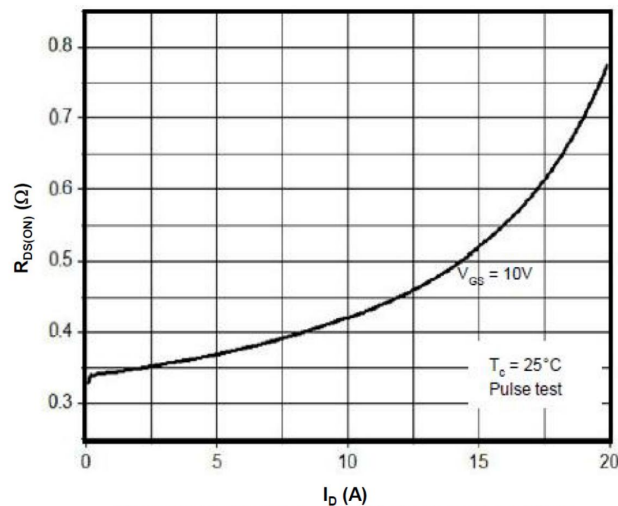


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

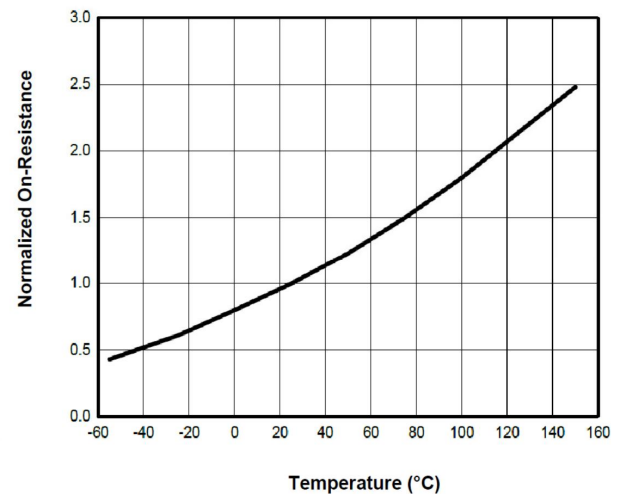


Figure 4: On-Resistance vs. Junction Temperature

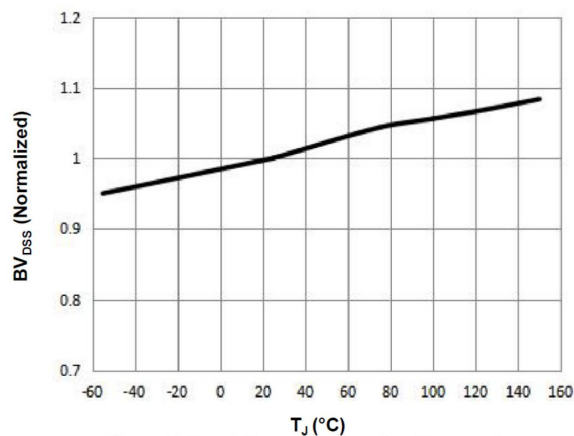


Figure 5: Break Down vs. Junction Temperature

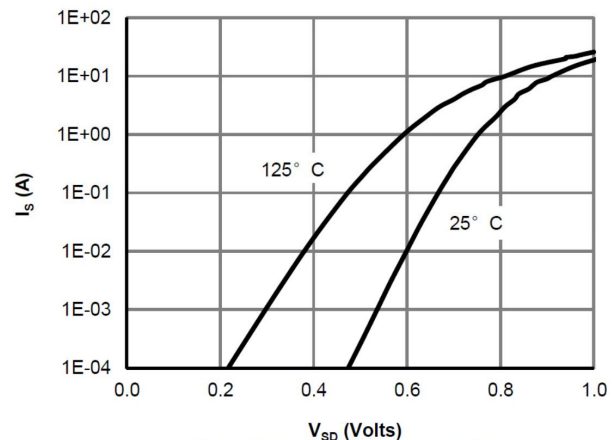


Figure 6: Body-Diode Characteristics

Electrical Characteristic Curve

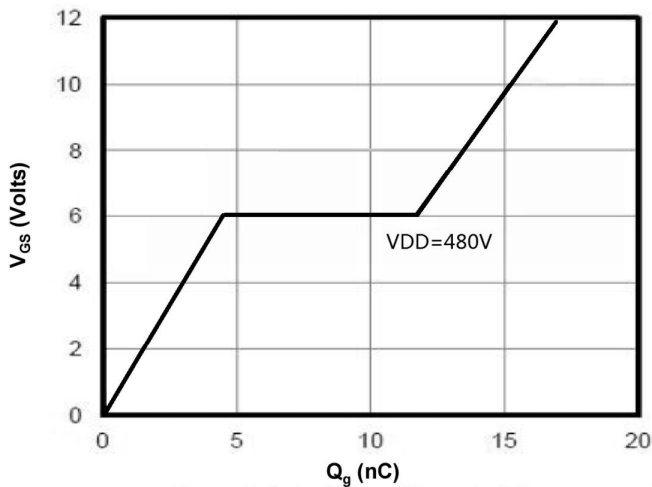


Figure 7: Gate-Charge Characteristics

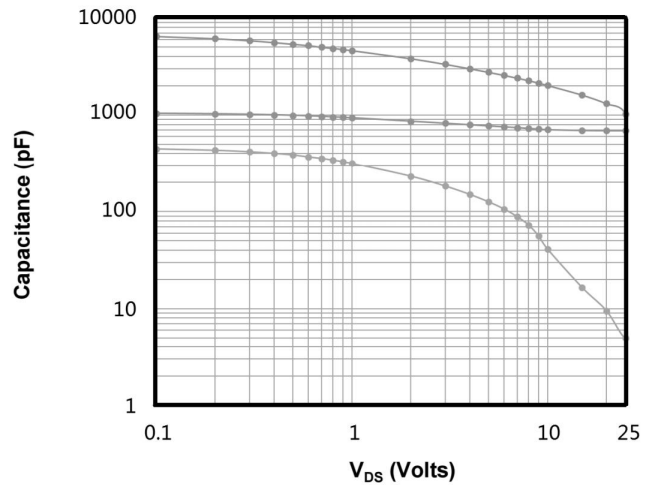


Figure 8: Capacitance Characteristics

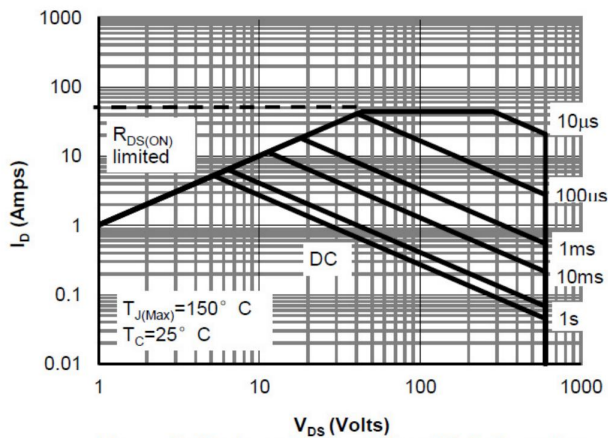


Figure 9 : Maximum Forward Biased Safe Operating Area

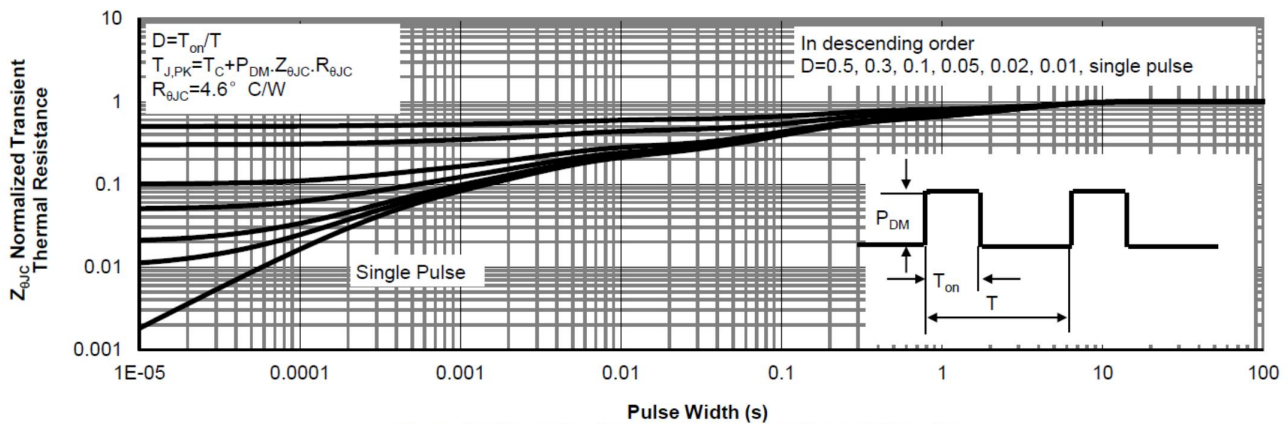
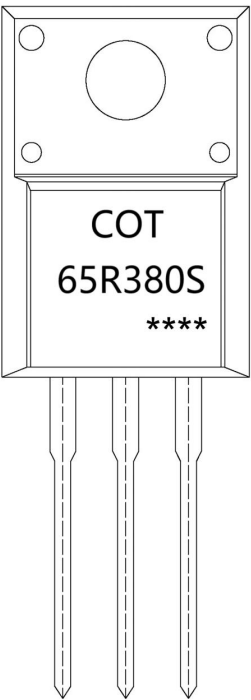


Figure 10: Normalized Maximum Transient Thermal Impedance

Marking Instructions



Note:
COT: Company Code
65R380S: Product Type Code
****: Lot No. Code, code change with Lot No

Packaging SPEC

TUBE

Package Type	Units					Dimension (unit: mm ³)		
	Units/Tube	Tubes/Inner Box	Units/Inner Box	Inner Boxes/Outer Box	Units/Outer Box	Tube	Inner Box	Outer Box
TO-220FL	50	20	1000	5	5000	532×33×7.0	555×164×50	575×290×180

Package Outline Dimensions

TO-220FL 单位: mm

