Descriptions

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

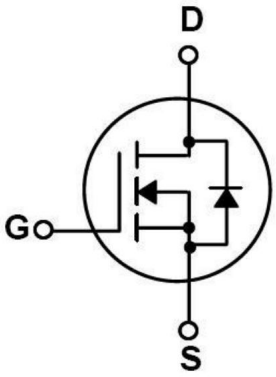
Features

- Very low RDS(on)×Qg
- 100%avalanche tested
- RoHS compliant.

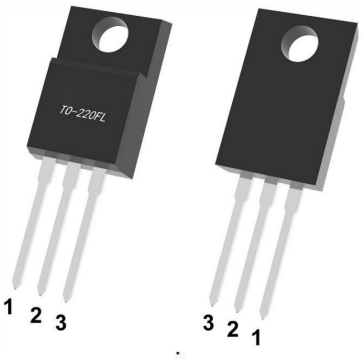
Applications

- For switch mode power supply
- Uninterruptible power supply
- Power factor correction

Equivalent Circuit



Pinning



PIN1:G PIN 2:D PIN 3:S

Absolute Maximum Ratings(Ta=25℃)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DSS}	650	V
Drain Current	I_D(Tc=25℃)	14	A
Drain Current - Pulsed	I_{DM}	56	A
Gate-Source Voltage	V_{GS}	±30	V
Single Pulsed Avalanche Energy	E_{AS}	433	mJ
Avalanche Current	I_{AS}	10	A
Power Dissipation	P_D(Tc=25℃)	30	W
Operating and Storage Temperature Range	T_J,T_{STG}	-55 to 150	℃
Junction-to-Case	$R_{\theta JC}$	4.2	℃/W
Junction-to-Ambient	$R_{\theta JA}$	65	℃/W

Electrical Characteristics(Ta=25℃)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA	650	700		V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=650V V_{GS}=0V T_J=25℃			1.0	μA
Gate-Body Leakage Current, Forward	I_{GSS}	V_{GS}=±30V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS} I_D=250μA	2.5	3.3	4.5	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V I_D=5.5A		235	280	mΩ
Drain-Source Diode Forward Voltage	V_{SD}	V_{GS}=0V I_{SD}=1A T_J=25℃			1.2	V
Gate Resistance	R_g	V_{GS} = 0V f = 1.0MHz		3.7		Ω
Input Capacitance	C_{iss}	V_{DS}=100V V_{GS}=0V f=1.0MHz		995		pF
Output Capacitance	C_{oss}			50		pF
Reverse Transfer Capacitance	C_{rss}			0.87		pF
Turn-On Delay Time	$t_{d(on)}$	V_{DS}=400V I_D=7.5A R_G=25Ω V_{GS}=10V		20		ns
Turn-On Rise Time	t_r			40		ns
Turn-Off Delay Time	$t_{d(off)}$			95		ns
Turn-Off Fall Time	t_f			43		ns

Electrical Characteristics(Ta=25℃)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Continuous Diode Forward Current	I_S				14	A
Total Gate Charge	Q_g	V_{DS}=520V I_D=7.5A V_{GS}=10V		26		nC
Gate-Source Charge	Q_{gs}			3.6		nC
Gate-Drain Charge	Q_{gd}			10.5		nC
Reverse recovery time	t_{rr}	V_R=400 V, I_F=7.5A, dI_F/dt=100 A/μs		405		ns
Reverse recovery charge	Q_{rr}			4.0		uC

Electrical Characteristic Curve

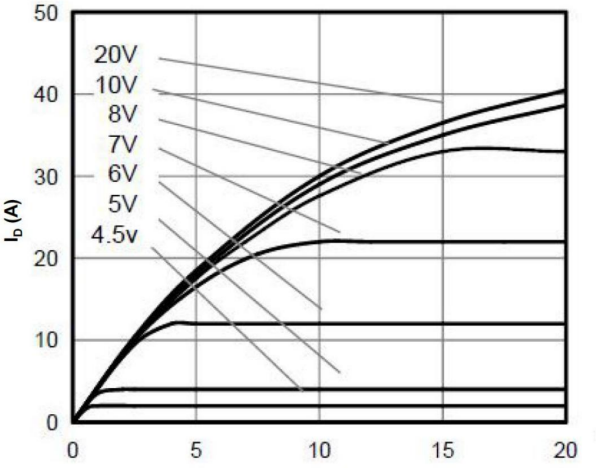


Figure 1: On-Region Characteristics

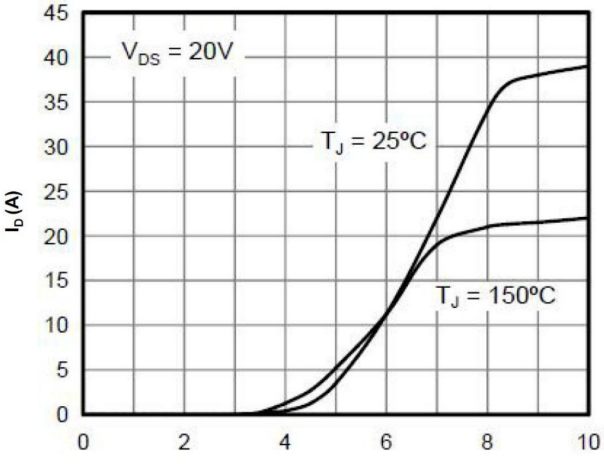


Figure 2: Transfer Characteristics

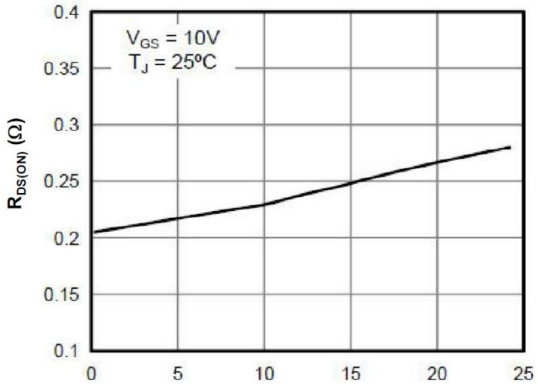


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

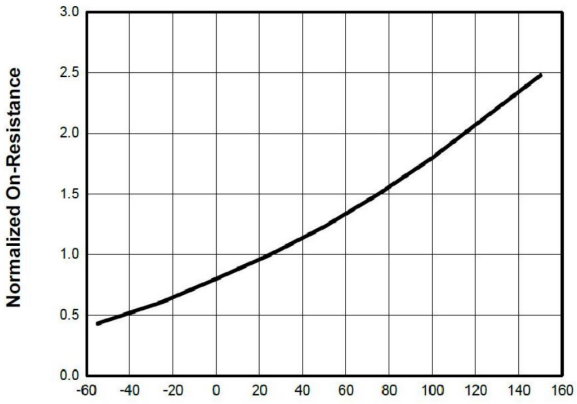


Figure 4: On-Resistance vs. Junction Temperature

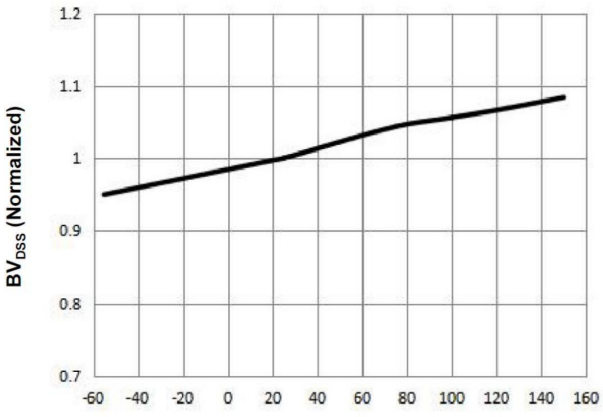


Figure 5: Break Down vs. Junction Temparature

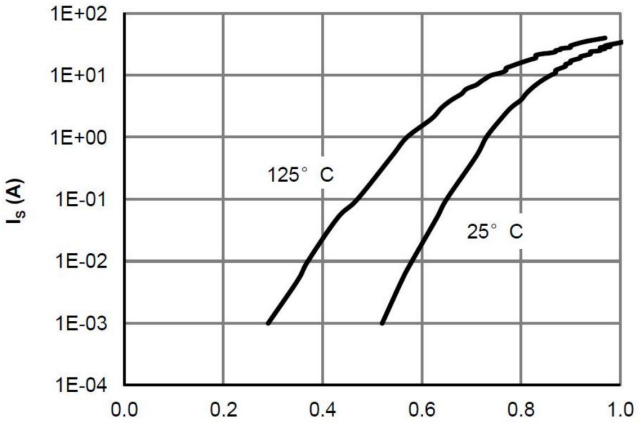


Figure 6: Body-Diode Characteristics

Electrical Characteristic Curve

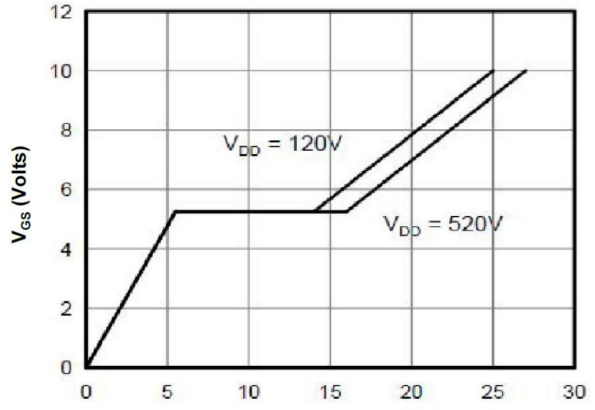


Figure 7: Gate-Charge Characteristics

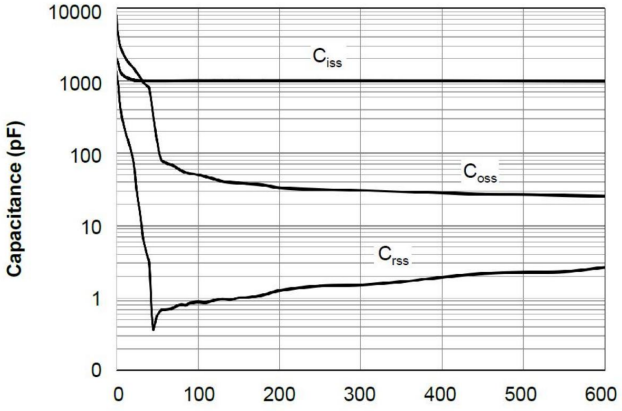


Figure 8: Capacitance Characteristics

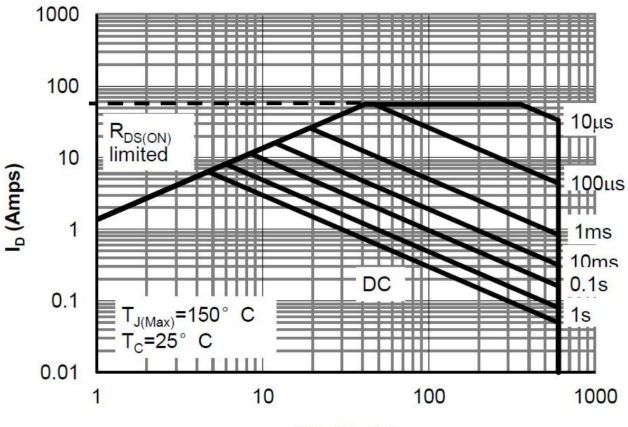


Figure 9: Maximum Forward Biased Safe Operating Area

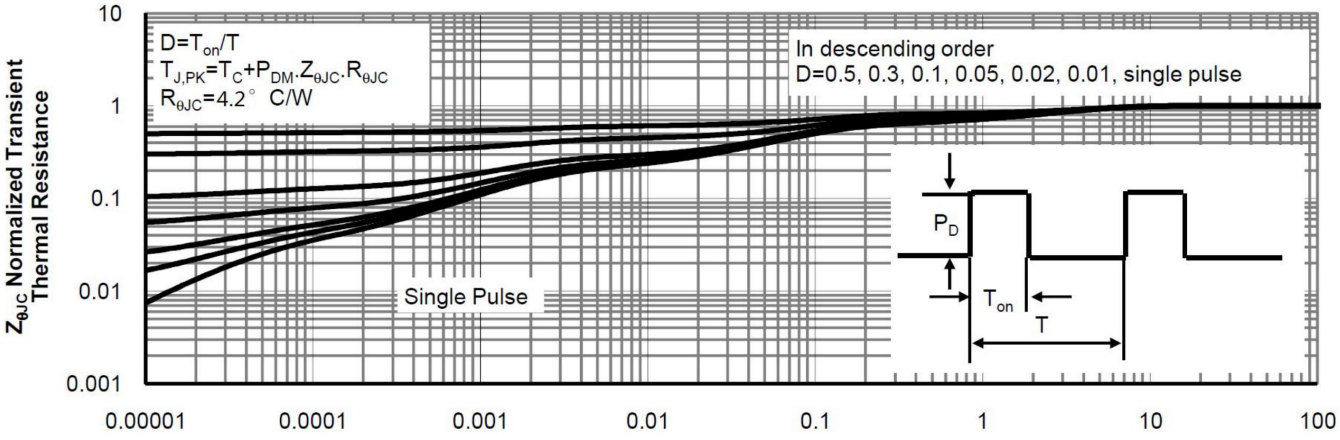
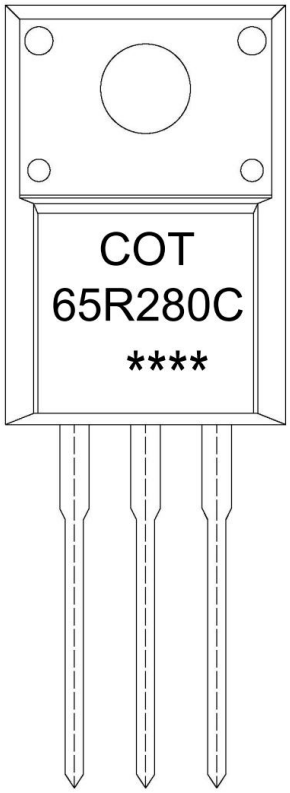


Figure 10: Normalized Maximum Transient Thermal Impedance

Marking Instructions



Note:

COT: Company Code

65R280C: Product Type

****: Lot No. Code, code change with Lot No

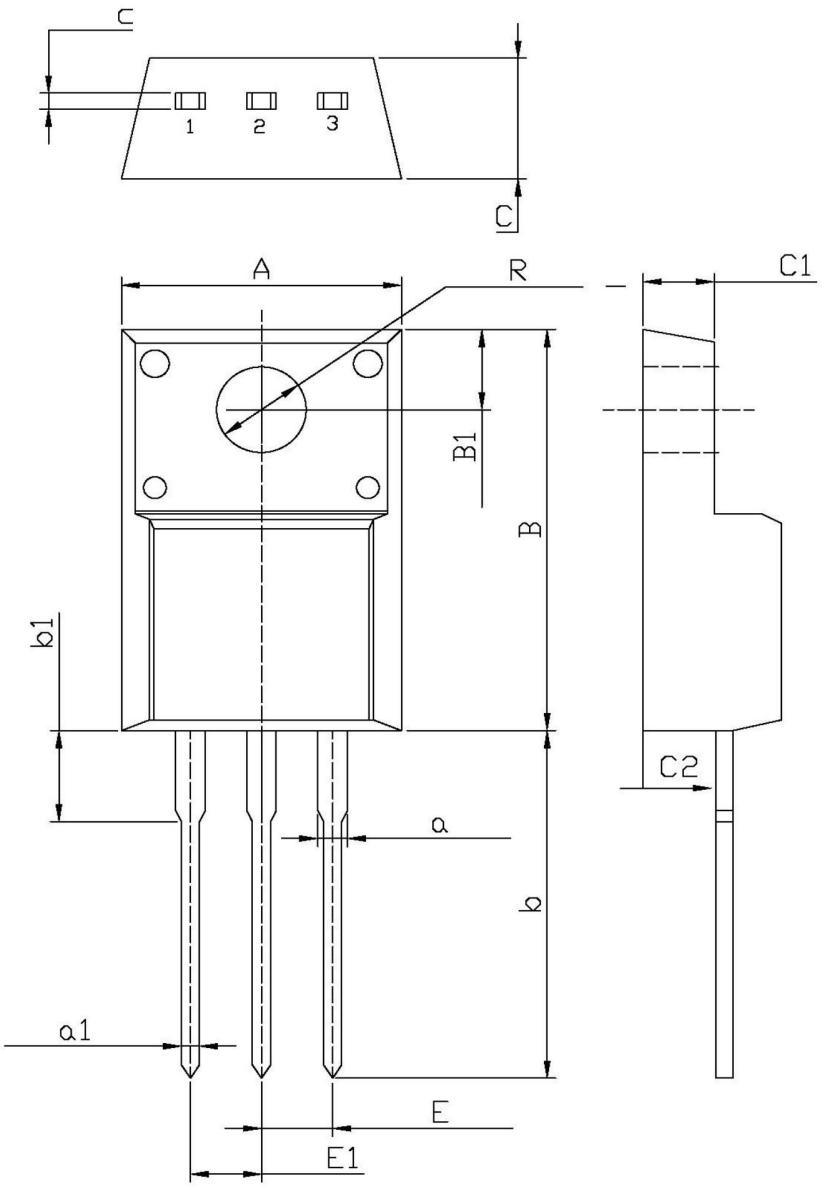
Marking Instructions

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	1,000	5	5,000	532×33×7.0	555×164×50	575×290×180

Marking Instructions

TO-220FL 单位：mm



Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
C	4.5	4.9	b1	2.90	3.90
c	0.4	0.6	a	1.08	1.48
A	9.96	10.36	a1	0.70	0.90
B	15.67	16.07	E	2.34	2.74
B1	3.30	3.50	E1	2.34	2.74
R	3.08	3.28	C1	2.34	2.74
b	12.48	13.48	C2	2.56	2.96