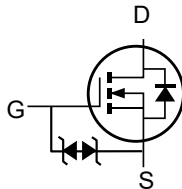
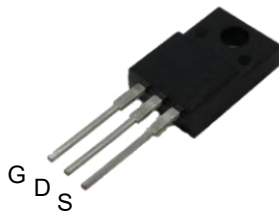


N-Channel Super Junction MOSFET

MCR65Z130CTF



Features

- Very Low FOM ($R_{DS(on)} \times Q_g$)
- Extremely low switching loss
- Excellent stability and uniformity
- 100% Avalanche Tested
- Built-in ESD Diode
- Fast Recovery Time

Application

- Power factor correction (PFC)
- Switched mode power supplies (SMPS)
- Uninterruptible Power Supply (UPS)
- AC to DC Converters
- Telecom, Solar

Table 1. Absolute Maximum Ratings ($T_C=25^\circ\text{C}$)

Parameter	Symbol	MCR65Z130CTF	Unit
Drain-Source Voltage	V_{DSS}	650	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current at $T_C = 25^\circ\text{C}$	I_D	25 *	A
Continuous Drain Current at $T_C = 100^\circ\text{C}$	I_D	15.8*	A
Pulsed drain current (Note 1)	I_{DM}	75*	A
Power Dissipation($T_C=25^\circ\text{C}$)	P_D	34	W
Single pulse avalanche energy (Note2)	E_{AS}	454	mJ
Avalanche current	I_{AR}	3.1	A
Gate source ESD(HBM-C=100pF, R=1.5K Ω)	$V_{ESD(G-S)}$	2000	V
MOSFET dv/dt ruggedness, $V_{DS}=0\ldots 400\text{V}$	dv/dt	50	V/ns
Reverse diode dv/dt, $V_{DS}=0\ldots 400\text{V}$, $I_{DS}\leq I_D$	dv/dt	15	V/ns
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55~+150	$^\circ\text{C}$
* limited by maximum junction temperature			

Table 2. Thermal Characteristic

Parameter	Symbol	MCR65Z130CTF	Unit
Thermal Resistance, Junction-to-Case (Maximum)	R_{thJC}	3.65	$^{\circ}\text{C}/\text{W}$
Thermal Resistance, Junction-to-Ambient (Maximum)	R_{thJA}	80	$^{\circ}\text{C}/\text{W}$

Table 3. Electrical Characteristics (TA=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
On/off states						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V I _D =1mA	650	--	--	V
Zero Gate Voltage Drain Current(Tc=25℃)	I _{DSS}	V _{DS} =650V, V _{GS} =0V	--	--	2	μA
Zero Gate Voltage Drain Current(Tc=125℃)	I _{DSS}	V _{DS} =650V, V _{GS} =0V	--	350	--	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	--	--	±1	μA
Gate Threshold Voltage	V _{GS (th)}	V _{DS} =V _{GS} , I _D =1.1mA	2.5	--	5.0	V
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} =10V, I _D =10.2A	--	115	130	mΩ
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =400V, V _{GS} =0V, F=1.0MHz	--	2840	--	pF
Output Capacitance	C _{oss}		--	61	--	pF
Reverse Transfer Capacitance	C _{rss}		--	3.8	--	pF
Total Gate Charge	Q _g	V _{DS} =520V, I _D =14.3A, V _{GS} =10V	--	65	--	nC
Gate-Source Charge	Q _{gs}		--	12	--	nC
Gate-Drain Charge	Q _{gd}		--	19	--	nC
Switching times						
Turn-on Delay Time	t _{d(on)}	V _{DD} =325V, I _D =14.3A, R _G =25Ω	--	56	--	nS
Turn-on Rise Time	t _r		--	31	--	nS
Turn-Off Delay Time	t _{d(off)}		--	250	--	nS
Turn-Off Fall Time	t _f		--	20	--	nS
Source- Drain Diode Characteristics						
Forward on voltage	V _{SD}	T _j =25℃, I _S =14.3A, V _{GS} =0V	--	--	1.3	V
Reverse Recovery Time	t _{rr}	V _R =400V, I _F =14.3A, di _F /dt=100A/μs	--	150	--	nS
Reverse Recovery Charge	Q _{rr}		--	1.0	--	μC

Notes: 1.Repetitive Rating: Pulse width limited by maximum junction temperature

2. $I_{AS}=3.1A$ $V_{DD}=100V, R_G=25\Omega$, Starting $T_J=25^{\circ}\text{C}$

Typical Characteristics)

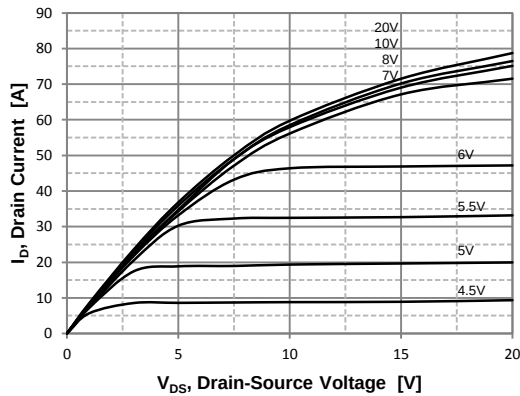


Figure 1. On Region Characteristics

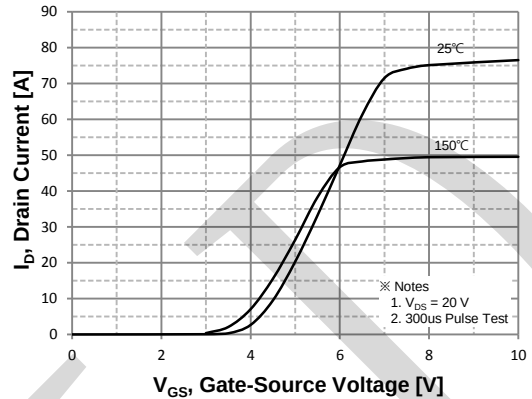


Figure 2. Transfer Characteristics

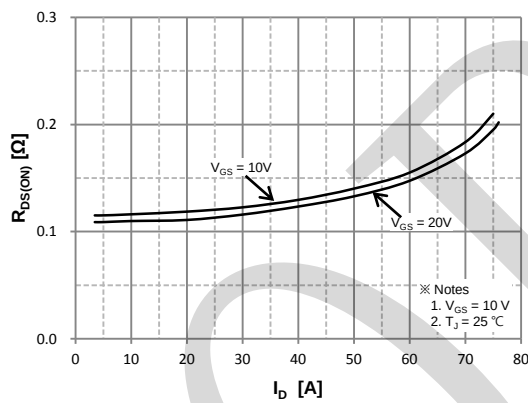


Figure 3. On Resistance Variation vs Drain Current and Gate Voltage

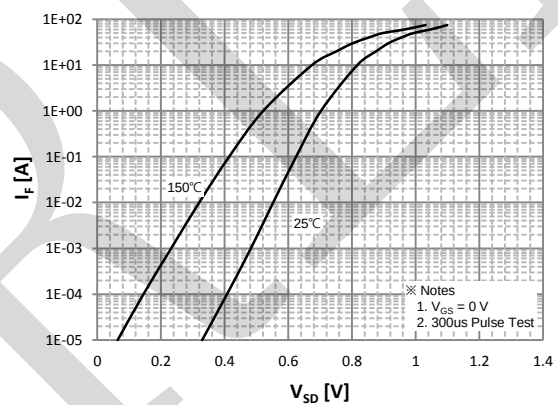


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

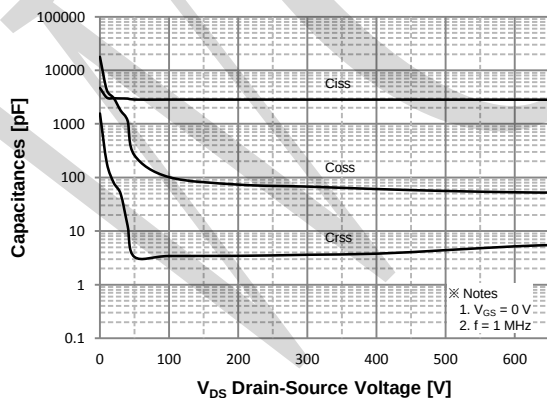


Figure 5. Capacitance Characteristics

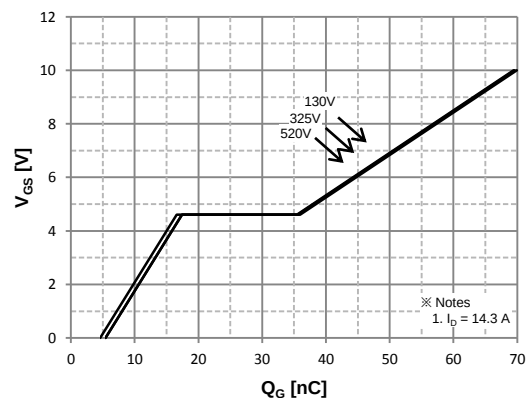


Figure 6. Gate Charge Characteristics

Typical Characteristics

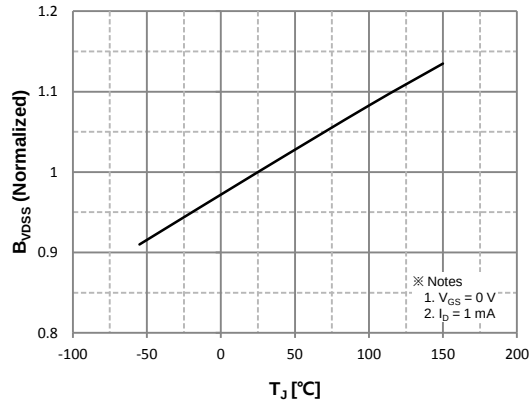


Figure 7. Breakdown Voltage Variation vs. Temperature

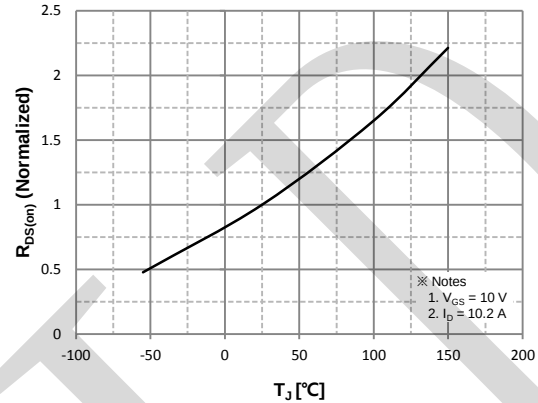


Figure 8. On-Resistance Variation vs. Temperature

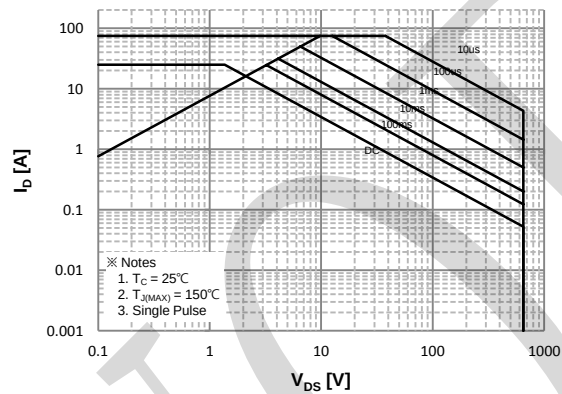


Figure 9. Maximum Safe Operating Area

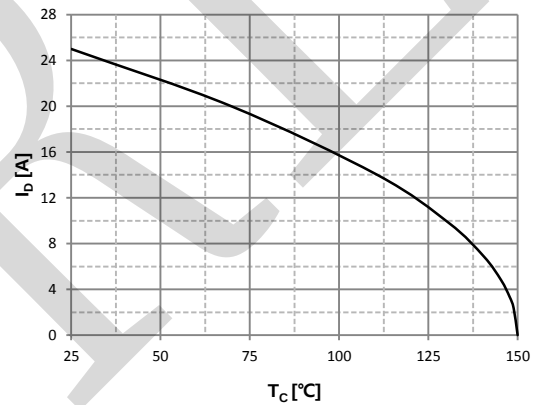


Figure 10. Maximum Drain Current vs. Case Temperature

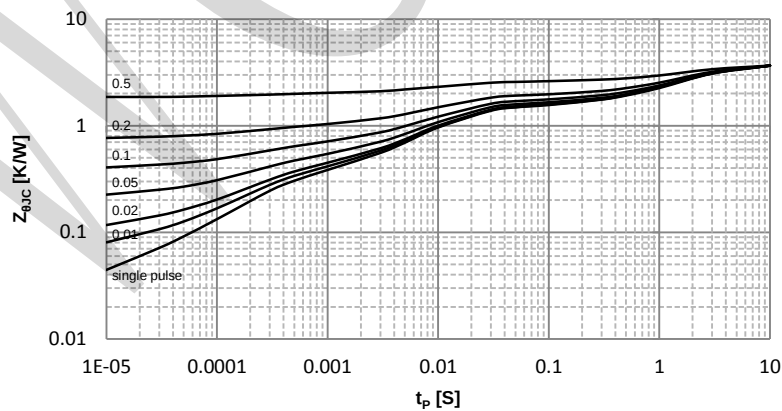
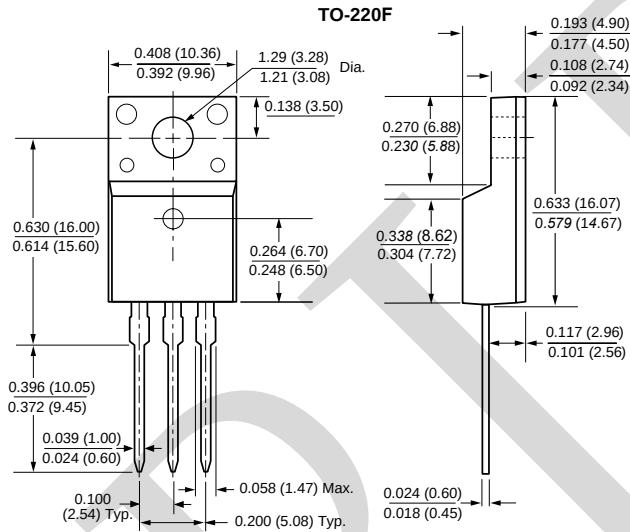


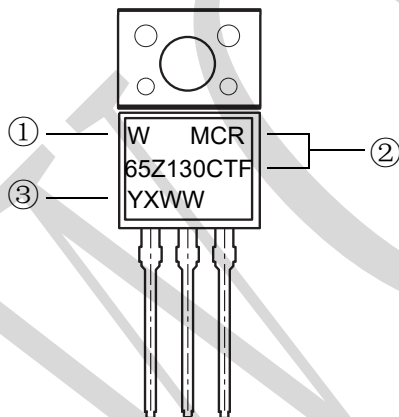
Figure 11. Transient Thermal Response Curve

PACKAGE OUTLINE DIMENSIONS

TO-220F Package Information



Marking Information



- ①W : Company's trademark
- ②Product model : MCR65Z130CTF
- ③PDC information:

Y X WW

WW:Week code(01 to 53)

X:Internal identification code

Y:Year code(ex:0=2020)