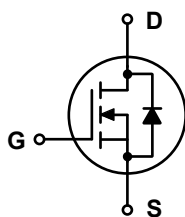
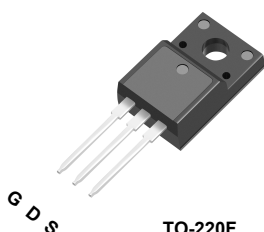


N-Channel Super Junction MOSFET

MCR65F158CTF

TO-220F



V_{DS}	650	V
$R_{DS(on),TYP,@ VGS=10V}$	150	mΩ
I_D	28	A

Features

1. Multi-Epi Super Junction MOSFET
2. Fast Switching
3. Ultra-Fast Body Diode
4. Easy to Drive/Use

Applications

1. SMPS
2. Motor Drivers
3. Charger/Power Supply
4. UPS

Maximum ratings, at $T_A = 25^\circ\text{C}$, unless otherwise specified

Absolute Maximum Ratings

PARAMETERS/TEST CONDITIONS	SYMBOL	LIMITS	UNITS
Drain-Source Voltage	V_{DS}	650	V
Drain Current –continuous @25°C	I_D	28	A
Drain Current –continuous @100°C		14	
Pulsed Drain Current ¹	I_{DM}	72	A
Gate-Source Voltage	V_{GS}	±30	V
Single Pulse Avalanche ²	E_{AS}	455	mJ
Operating and Storage Temperature Range	T_J, T_{stg}	-55 to 150	°C
Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	T_L	260	°C

Note:

1. Pulse width limited by maximum junction temperature.
2. EAS condition: $T_J = 25^\circ\text{C}$, $V_{DD} = 50\text{V}$, $V_G = 10\text{V}$, $L = 10\text{mH}$,

Electrical Characteristics

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
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Electrical Characteristics ($T_C = 25^\circ\text{C}$ unless otherwise noted)

$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	650	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=650V, V_{GS}=0V$	--	--	10	μA
I_{GSS}	Gate-Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 30V$	--	--	± 100	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	--	4	--	V
$R_{DS(on)}$	Drain-Source On-State Resistance	$V_{GS}=10V, I_D=3.5A$	--	--	150	m Ω

Dynamic Electrical Characteristics @ $T_J = 25^\circ\text{C}$ (unless otherwise stated)

C_{iss}	Input Capacitance	$V_{DS}=100V, V_{GS}=0V, f=100KHz$	--	2072	--	pF
C_{oss}	Output Capacitance		--	101	--	pF
C_{rss}	Reverse Transfer Capacitance		--	1.3	--	pF
Q_g	Total Gate Charge	$V_{DS}=400V, I_D=12A, V_{GS}=10V$	--	46	--	nC
Q_{gs}	Gate-Source Charge		--	8	--	nC
Q_{gd}	Gate-Drain Charge		--	15	--	nC

Switching Characteristics

$T_{d(on)}$	Turn-on Delay Time	$V_{DS}=400V, I_D=12A, R_G=4.7\Omega, V_{GS}=10V$	--	21	--	ns
T_r	Turn-on Rise Time		--	40	--	ns
$T_{d(off)}$	Turn-Off Delay Time		--	56	--	ns
T_f	Turn-Off Fall Time		--	14	--	ns

Source- Drain Diode Characteristics@ $T_j = 25^\circ\text{C}$ (unless otherwise stated)

I_s	Continuous Current		--	--	28	A
I_{sm}	Maximum pulsed drain to source diode forward current		--	--	72	A
V_{SD}	Forward Voltage	$V_{GS} = 0V$, $I_{SD} = 30A$	--	--	1.4	V
T_{rr}	Reverse Recovery Time	$V_R = 400V$, $I_{SD} = 4.0A$, $dI_F/dt = 100A/\mu s$	--	110	--	ns
Q_{rr}	Reverse Recovery Charge		--	0.79	--	μC
I_{mm}	Reverse recovery current		--	3	--	A
T_{on}	Forward Turn-on Time	Intrinsic turn-on time is negligible(turn-on is dominated by $L_S + L_D$)				

Typical Characteristics

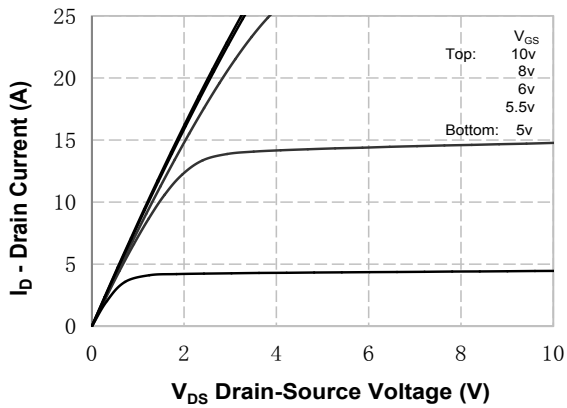


Figure 1. On-Region Characteristics

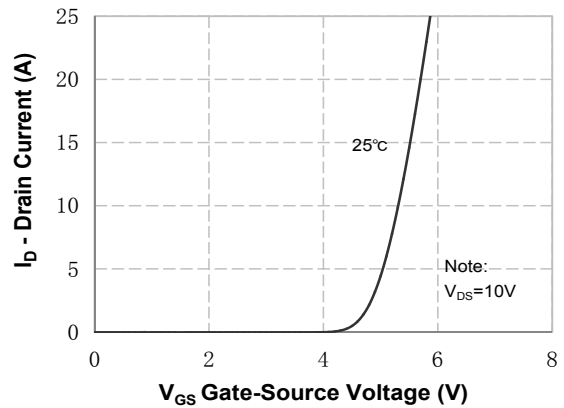


Figure 2. Transfer Characteristics

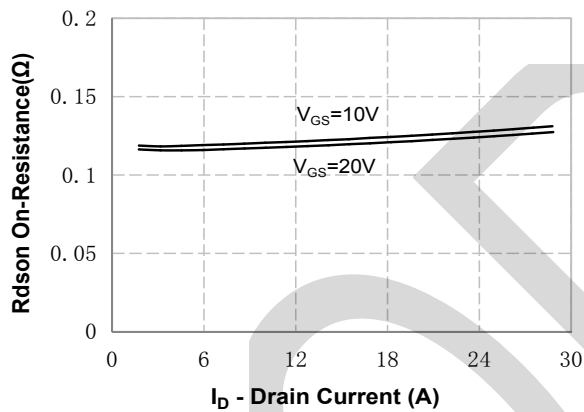


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

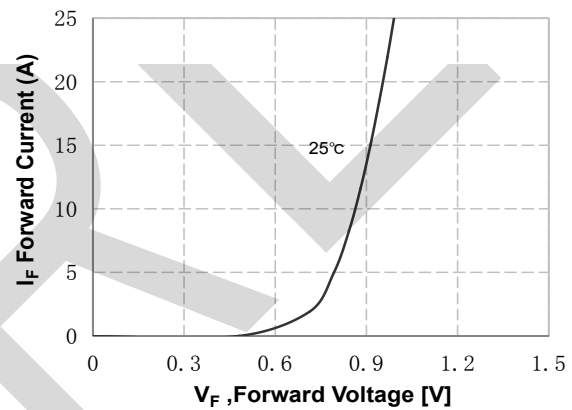


Figure 4. Body Diode Forward Voltage Variation with Source Current

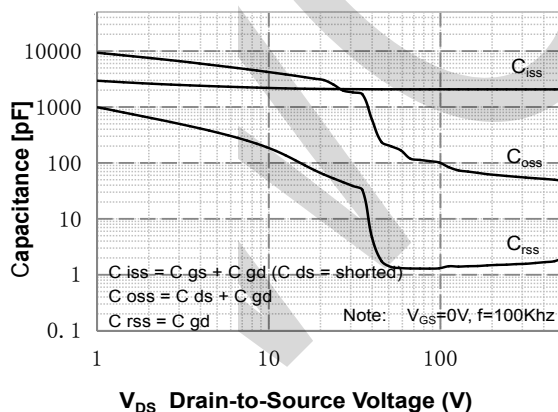


Figure 5. Capacitance Characteristics

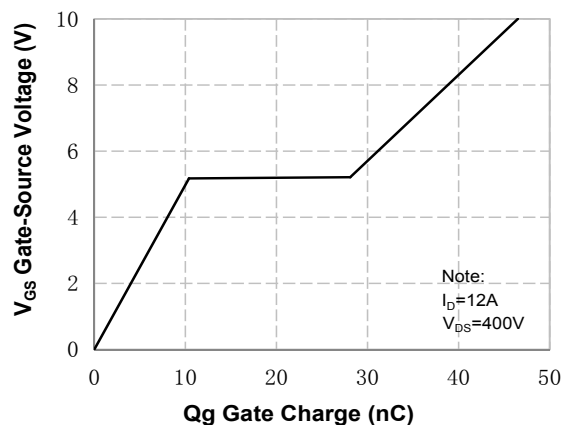


Figure 6. Gate Charge Characteristics

Typical Characteristics (Continued)

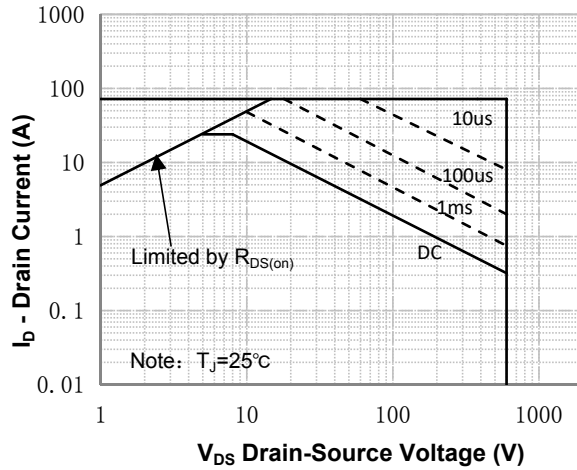


Figure 7. Maximum Safe Operating Area

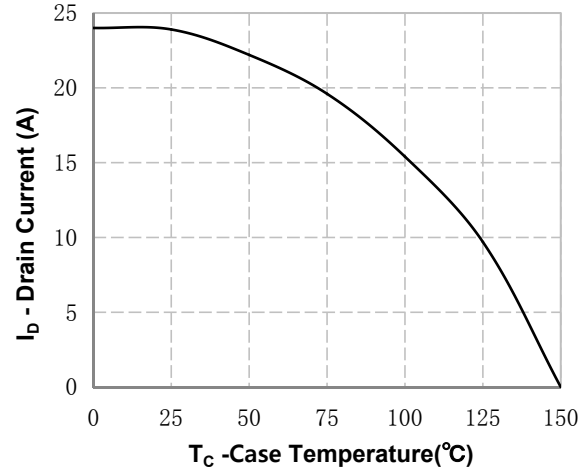


Figure 8. Maximum Drain Current vs Case Temperature

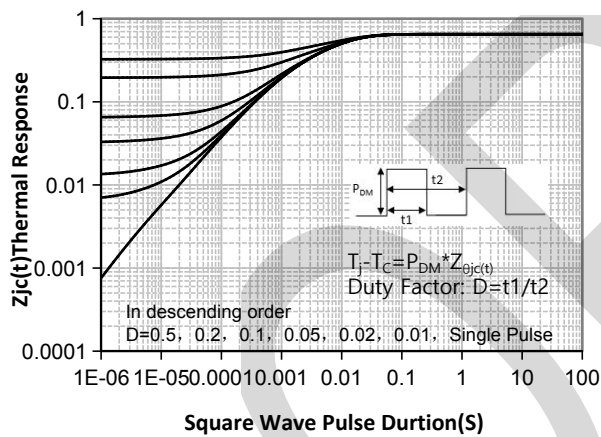
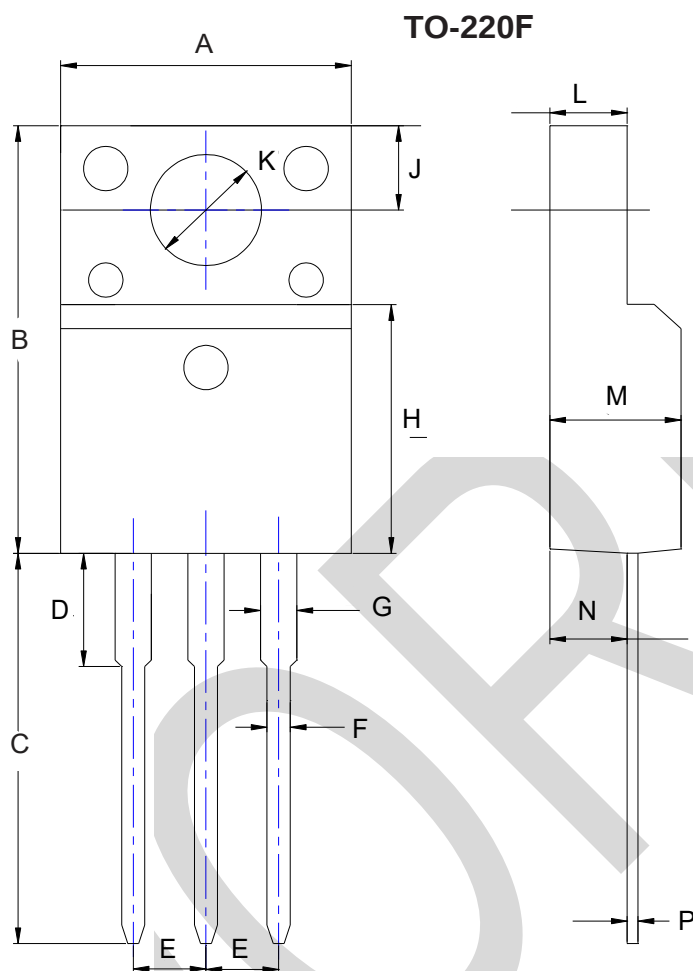


Figure 9. Transient Thermal Response Curve

PACKAGE OUTLINE DIMENSIONS

Note:unit mm



TO-220F mechanical data

UNIT		A	B	C	D	E	F	G	H	J	K	L	M	N	P
mm	min	9.7	15.5	12.6	2.7	2.3	0.4	1.1	8.9	3.1	3.0	2.3	4.5	2.6	0.4
	max	10.3	16.2	13.6	3.2	2.8	0.6	1.5	9.4	3.6	3.3	2.8	4.9	3.0	0.6
mil	min	381.8	610.2	496.1	106.3	90.5	15.7	43.3	350.4	122.0	118.1	90.5	177.1	102.4	15.7
	max	405.5	637.8	535.5	126.0	110.2	23.7	59.1	370.1	141.7	129.9	110.2	192.9	118.1	23.7