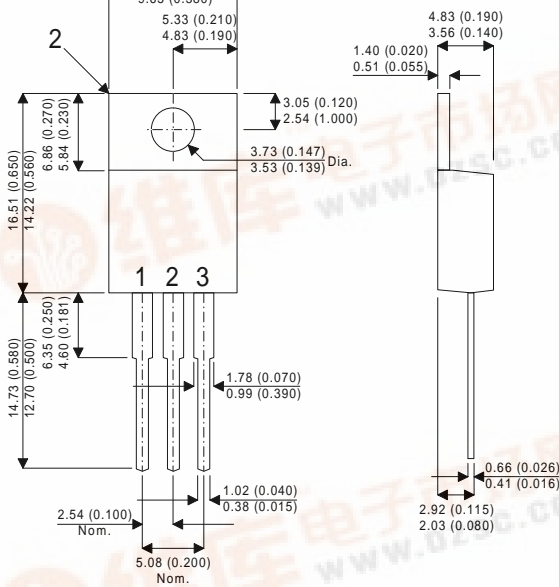


BFC63

TO220-AC Package Outline.  
Dimensions in mm (inches)



Pin 1 — Gate      Pin 2 — Drain      Pin 3 — Source

## 4TH GENERATION MOSFET

**N-CHANNEL  
ENHANCEMENT MODE  
HIGH VOLTAGE  
POWER MOSFETS**

$V_{DSS}$       **600V**  
 $I_{D(cont)}$       **6.5A**  
 $R_{DS(on)}$       **1.30Ω**

### ABSOLUTE MAXIMUM RATINGS ( $T_{case} = 25^{\circ}C$ unless otherwise stated)

$V_{DSS}$	Drain – Source Voltage	600	V
$I_D$	Continuous Drain Current	6.5	A
$I_{DM}$	Pulsed Drain Current <sup>1</sup>	26	A
$V_{GS}$	Gate – Source Voltage	±30	V
$P_D$	Total Power Dissipation @ $T_{case} = 25^{\circ}C$	125	W
$T_J, T_{STG}$	Operating and Storage Junction Temperature Range	-55 to 150	°C
$T_L$	Lead Temperature : 0.063" from Case for 10 Sec.	300	

### STATIC ELECTRICAL RATINGS ( $T_{case} = 25^{\circ}C$ unless otherwise stated)

	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
$BV_{DSS}$	Drain – Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	600			V
$I_{D(ON)}$	On State Drain Current <sup>2</sup>	$V_{DS} > I_{D(ON)} \times R_{DS(ON)}$ Max $V_{GS} = 10V$	4.7			A
$R_{DS(ON)}$	Drain – Source On State Resistance <sup>2</sup>	$V_{GS} = 10V, I_D = 0.5 I_D [Cont.]$			1.30	Ω
$I_{DSS}$	Zero Gate Voltage Drain Current ( $V_{GS} = 0V$ )	$V_{DS} = V_{DSS}$			250	μA
		$V_{DS} = 0.8V_{DSS}, T_C = 125^{\circ}C$			1000	
$I_{GSS}$	Gate – Source Leakage Current	$V_{GS} = \pm 30V, V_{DS} = 0V$			±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 1.0mA$	2		4	V

<sup>1</sup> Repetitive Rating: Pulse Width limited by maximum junction temperature.

<sup>2</sup> Pulse Test: Pulse Width < 380μS, Duty Cycle < 2%



**DYNAMIC CHARACTERISTICS**

	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
$C_{iss}$	Input Capacitance	$V_{GS} = 0V$		764	950	pF
$C_{oss}$	Output Capacitance	$V_{DS} = 25V$		153	214	
$C_{riss}$	Reverse Transfer Capacitance	$f = 1MHz$		54	81	
$Q_g$	Total Gate Charge <sup>3</sup>	$V_{GS} = 10V$		34	55	nC
$Q_{gs}$	Gate – Source Charge	$V_{DD} = 0.5 V_{DSS}$		4.6	7	
$Q_{gd}$	Gate – Drain (“Miller”) Charge	$I_D = I_D [Cont.]$		15	23	
$t_{d(on)}$	Turn-on Delay Time	$V_{GS} = 15V$		10	20	ns
$t_r$	Rise Time	$V_{DD} = 0.5 V_{DSS}$		11	22	
$t_{d(off)}$	Turn-off Delay Time	$I_D = I_D [Cont.]$		31	47	
$t_f$	Fall Time	$R_G = 1.8\Omega$		10	20	

**SOURCE – DRAIN DIODE RATINGS AND CHARACTERISTICS**

	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
$I_S$	Continuous Source Current (Body Diode)				6.5	A
$I_{SM}$	Pulsed Source Current <sup>1</sup> (Body Diode)				26	
$V_{SD}$	Diode Forward Voltage <sup>2</sup>	$V_{GS} = 0V, I_S = -I_D [Cont.]$			1.3	V
$t_{rr}$	Reverse Recovery Time	$I_S = -I_D [Cont.] \text{ } dI_S / dt = 100A/\mu s$	130	260	520	ns
$Q_{rr}$	Reverse Recovery Charge		1.3	2.6	5.2	$\mu C$

**SAFE OPERATING AREA CHARACTERISTICS**

	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
SOA1	Safe Operating Area	$V_{DS} = 0.4V_{DSS}, t = 1 \text{ Sec.}$ $I_{DS} = P_D / 0.4V_{DSS}$	125			W
SOA2	Safe Operating Area	$V_{DS} = P_D / I_D [Cont.]$ $I_{DS} = I_D [Cont.], t = 1 \text{ Sec.}$	125			W
$I_{LM}$	Inductive Current Clamped		26			A

**THERMAL CHARACTERISTICS**

	Characteristic	Min.	Typ.	Max.	Unit
$R_{\theta JC}$	Junction to Case			1.0	$^{\circ}C/W$
$R_{\theta JA}$	Junction to Ambient			80	

1) Repetitive Rating: Pulse Width limited by maximum junction temperature.

2) Pulse Test: Pulse Width < 380 $\mu s$ , Duty Cycle < 2%

3) See MIL-STD-750 Method 3471



CAUTION — Electrostatic Sensitive Devices. Anti-Static Procedures Must Be Followed.