BCT16N65

650V N-Channel Power MOSFET

General Description

BCT16N65 uses advanced technology to provide low $R_{DS(on)}$, low gate charge and fast switching characteristics. This device is suitable for power applications.

Features

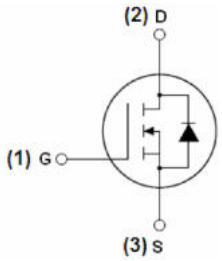
- Low $R_{DS(on)}$
- Low FOM
- Extremely low switching loss
- Good stability and uniformity

TO-220F

Top View

Applications

- Consumer electronics power supply
- LCD/LED/PDP
- Portable digital power management
- PFC



Schematic Diagram

BV_{DSS}	650	V
I_D	16	A
$R_{DS(on),typical@10V}$	0.49	Ω
$V_{GS(th),typical}$	3	V
Package	TO-220F	

Ordering Information

Part Number	Package	Form	Minimum Order Quantity
BCT16N65	TO-220F	Tube	1000

Absolute Maximum Ratings (T_A=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	650	V
Gate-Source Voltage	V_{GS}	±30	V
Drain Current-Continuous(Note 1)	I_D	16	A
Drain Current-Pulsed(Note 2)	I_{DM}	64	A
Power Dissipation(Note 3)	P_D	70	W
Single Pulsed-Avalanche Energy(Note 4)	E_{AS}	800	mJ
Operation and Storage Junction Temperature	T_J,T_{STG}	-55 to 150	°C

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.79	°C/W
Thermal Resistance, Junction-to-Ambient (Note 5)	$R_{\theta JA}$	62	°C/W

Electrical Characteristics (T_A=25°C unless otherwise noted)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Drain-Source Breakdown Voltage	BV_{DSS}	650			V	V_{GS} = 0V, I_D = 250μA
Gate Threshold Voltage	$V_{GS(th)}$	2	3	4	V	V_{DS} = V_{GS}, I_D = 250μA
Drain-Source On-State Resistance	$R_{DS(on)}$		0.49	0.55	Ω	V_{GS} = 10V,I_D = 8A
Gate-Source Leakage Current	I_{GSS}			100	nA	V_{GS} = 30V
				-100	nA	V_{GS} = -30V
Drain-Source Leakage Current	I_{DSS}			1	μA	V_{DS} = 650V,V_{GS} = 0V

Dynamic Characteristics

Input Capacitance	C_{iss}		2540		pF	V_{GS} = 0V,
Output Capacitance	C_{oss}		218		pF	V_{DS} = 25V,
Reverse Transfer Capacitance	C_{rss}		18		pF	f = 1MHz
Turn-On Delay Time	$t_{d(on)}$		30		ns	I_D = 8A,
Turn-On Rise Time	t_r		70		ns	V_{GS} = 10V,
Turn-Off Delay Time	$t_{d(off)}$		145		ns	V_{DS} = 325V,
Turn-Off Fall Time	t_f		74		ns	R_G = 3Ω

Gate Charge Characteristics

Total Gate Charge	Q_g		54		nC	I_D = 8A,
Gate-Source Charge	Q_{gs}		10		nC	V_{DS} = 325V,
Gate-Drain Charge	Q_{gd}		21		nC	V_{GS} = 10V

Body Diode Characteristics

Body Diode Forward Current	I_S			16	A	V_{GS} < V_{th}
Diode Forward Voltage	V_{SD}			1.5	V	I_S =16A, V_{GS} = 0V
Reverse Recovery Time	t_{rr}		410		ns	I_S = 16A, V_{GS} = 0V
Reverse Recovery Charge	Q_{rr}		3.5		μC	di/dt = 100A/μs

Notes

1. Calculated continuous current based on maximum allowable junction temperature.
2. Repetitive rating, pulse width limited by maximum junction temperature.
3. P_D is based on maximum junction temperature, using junction-to-case thermal resistance.
4. V_{DD} = 50V, R_G = 25Ω, L = 10mH, Starting T_J = 25°C.
5. The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C.

Electrical Characteristics Diagrams

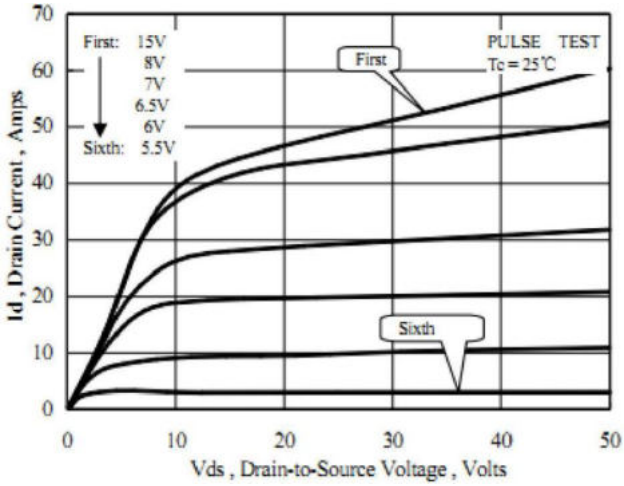


Figure 1. Typical Output Characteristics

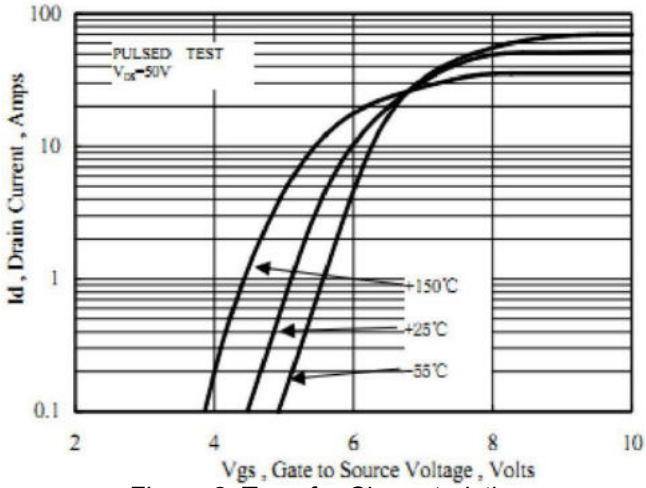


Figure 2. Transfer Characteristics

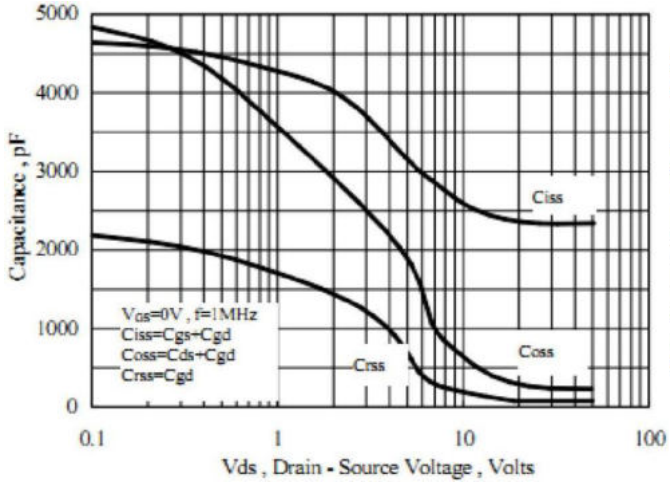


Figure 3. Typical Capacitances

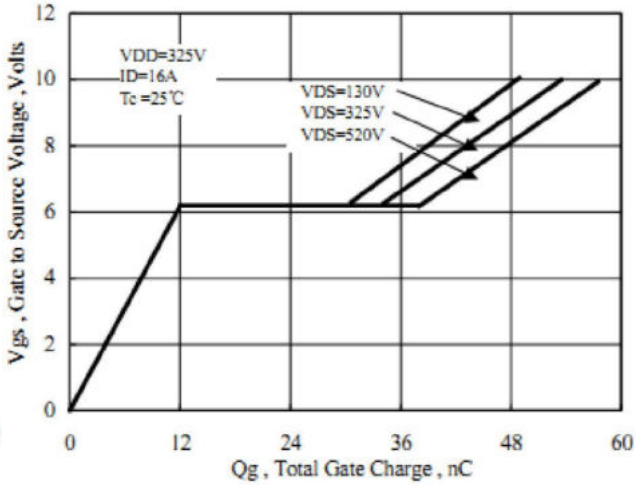


Figure 4. Typical Gate Charge

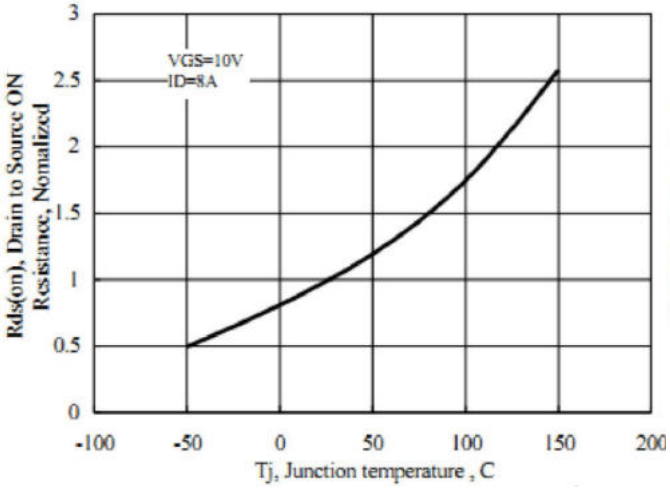


Figure 5. Drain Current On-State Resistance

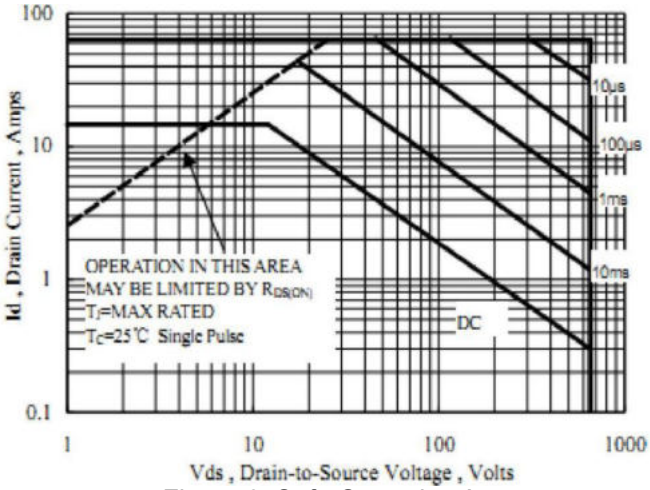
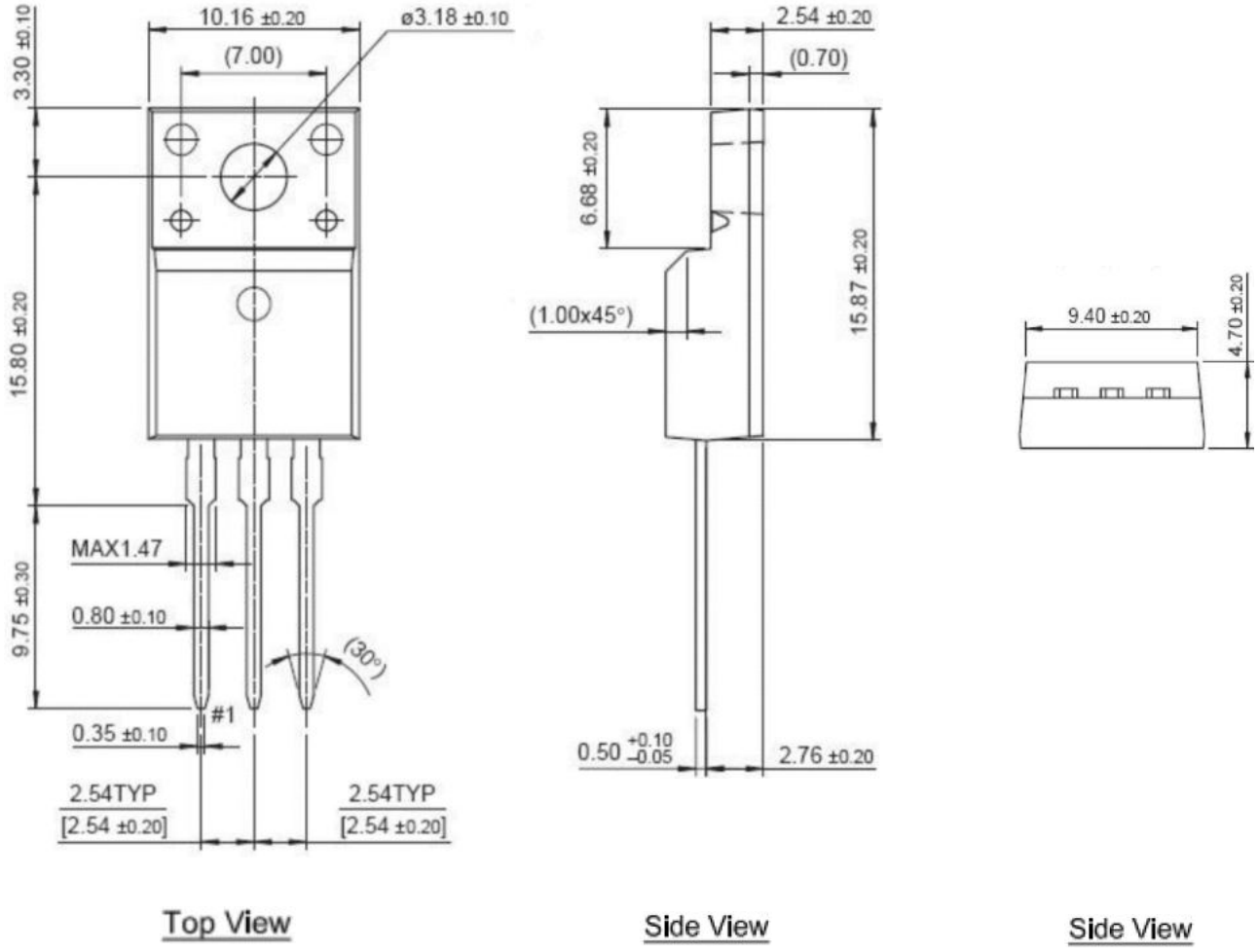


Figure 6. Safe Operation Area

Package Outline Dimensions

TO-220F



Package	Units/Tube	Tubes/Inner Box	Units/Inner Box	Inner Box/Carton Box	Units/Carton Box
TO-220F	50	20	1000	5	5000