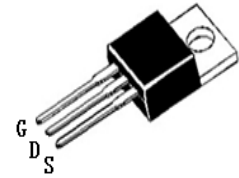
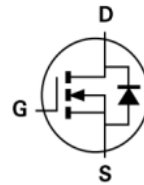


# N-Channel Enhancement Mode Power MOSFET

## CS20N65A

### MAIN CHARACTERISTICS

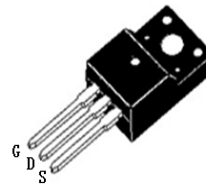
$I_D$	20A
$V_{DSS}$	650V
$R_{DS(on)-max}$ (@ $V_{GS}=10V$ )	0.5 $\Omega$
$Q_G$ -typ	58nC



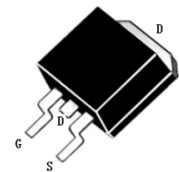
CS20N65A1/TO-220AB

### FEATURES

- Fast Switching
- Low ON Resistance
- Low Gate Charge
- 100% Single Pulse avalanche energy Test



CS20N65A2/TO-220F



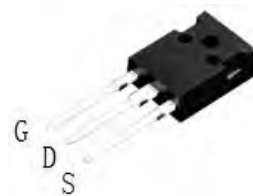
CS20N65A3/TO-263

### APPLICATIONS

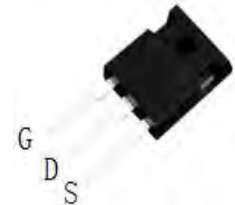
- Power switch circuit of adaptor and charger.

### MECHANICAL DATA

- Case: Molded plastic
- Mounting Position: Any
- Molded Plastic: UL Flammability Classification Rating 94V-0
- Lead free in compliance with EU RoHS 2011/65/EU directive
- Solder bath temperature 275 $^{\circ}$ C maximum, 10s per JESD 22-B106

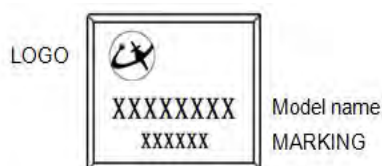


CS20N65A6/TO-247



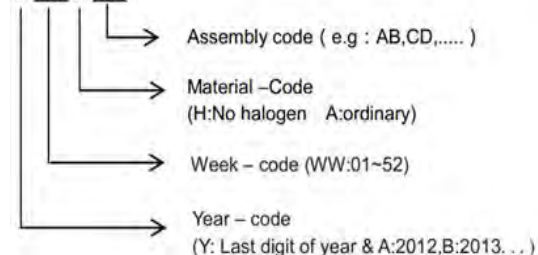
CS20N65A7/TO-247S

### Marking on the body



#### MAKING:

X X X X X X



### Ordering information

Part Number	Package	Unit Weight	Base Quantity	Delivery mode
CS20N65A1	TO-220AB	0.07oz(1.96g)	50 pcs / tube	1Kpcs/box 5Kpcs/carton
CS20N65A2	TO-220F	0.06oz(1.74g)	50 pcs / tube	1Kpcs/box 5Kpcs/carton
CS20N65A3	TO-263	0.04oz(1.16g)	50 pcs / tube	1Kpcs/box 5Kpcs/carton
CS20N65A3-R	TO-263	0.04oz(1.16g)	800 pcs / reel	800pcs/box 4Kpcs/carton
CS20N65A6	TO-247	0.209oz(5.93g)	30 pcs / tube	600pcs/box 2.4Kpcs/carton
CS20N65A7	TO-247S	0.158oz(4.48g)	30 pcs / tube	600pcs/box 2.4Kpcs/carton

# CS20N65A

## Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbol	Value			Unit
		220AB/263	220F	247/247S	
Drain-Source Voltage	$V_{DS}$	650			V
Gate-Source Voltage	$V_{GS}$	±30			V
Continue Drain Current	$I_D$	20			A
Pulsed Drain Current (Note1)	$I_{DM}$	80			A
Power Dissipation	$P_D$	250	45	250	W
Single Pulse Avalanche Energy (Note1)	$E_{AS}$	1200			mJ
Operating Temperature Range	$T_J$	150			°C
Storage Temperature Range	$T_{STG}$	-55 to +150			°C
Thermal Resistance, Junction to Case	$R_{\theta JC}$	0.5	2.78	0.5	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	40	62.5	40	°C/W

Note1:Pulse test: 300 μs pulse width, 2 % duty cycle

## Electrical Characteristics at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = 0 V, I_D = 250 \mu A$	$BV_{DSS}$	650	-	-	V
Drain-Source Leakage Current	$V_{DS} = 650 V, V_{GS} = 0 V$	$I_{DSS}$	-	-	1	μA
Gate Leakage Current	$V_{GS} = \pm 30 V, V_{DS} = 0 V$	$I_{GSS}$	-	-	±100	nA
Gate-Source Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250 \mu A$	$V_{GS(th)}$	2	-	4	V
Drain-Source On-State Resistance	$V_{GS} = 10 V, I_D = 10 A$	$R_{DS(on)}$	-	-	0.5	Ω
Forward Transconductance	$V_{DS} = 15 V, I_D = 10 A$	$g_{fs}$	-	18	-	S
Input Capacitance	$V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz$	$C_{iss}$	-	2980	-	pF
Output Capacitance		$C_{oss}$	-	320	-	pF
Reverse Transfer Capacitance		$C_{rss}$	-	20	-	pF
Turn-on Delay Time(Note2)	$I_D = 20 A, V_{DD} = 250 V, R_G = 10 \Omega$	$t_{d(ON)}$	-	36	-	ns
Rise Time(Note2)		$t_r$	-	75	-	ns
Turn-Off Delay Time(Note2)		$t_{d(OFF)}$	-	79	-	ns
Fall Time(Note2)		$t_f$	-	59	-	ns
Total Gate Charge(Note2)	$I_D = 20 A, V_{DD} = 400 V, V_{GS} = 10 V$	$Q_G$	-	58	-	nC
Gate to Source Charge(Note2)		$Q_{GS}$	-	14	-	nC
Gate to Drain Charge(Note2)		$Q_{GD}$	-	23	-	nC

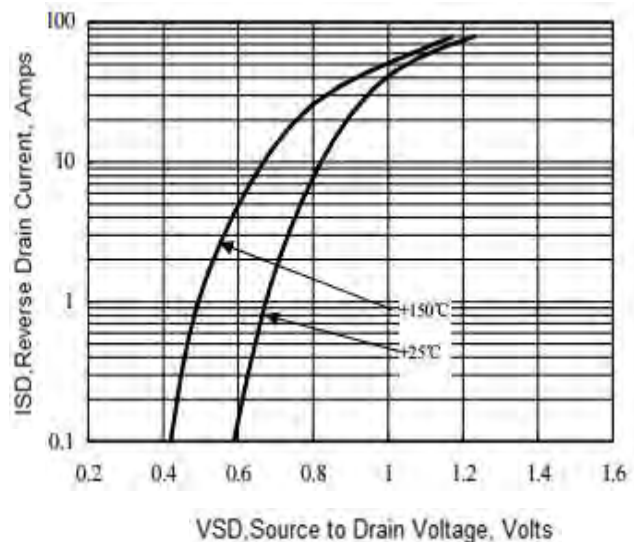
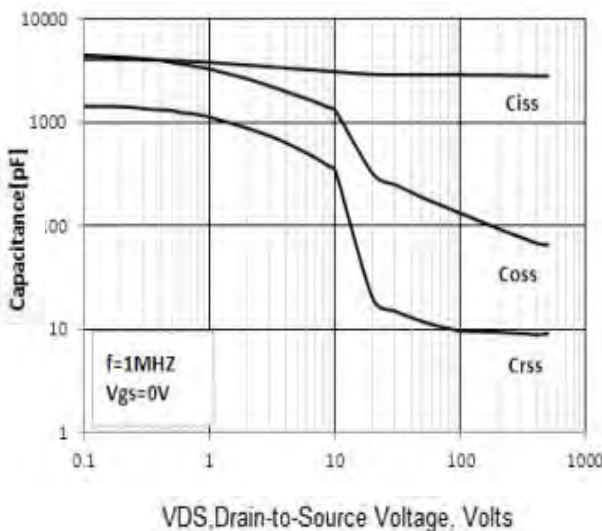
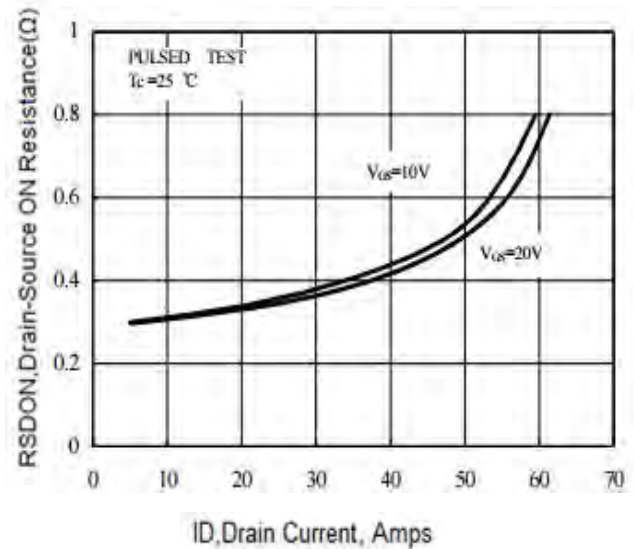
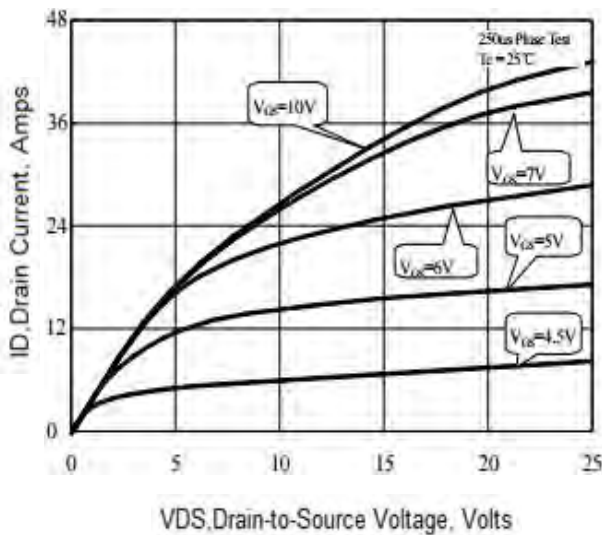
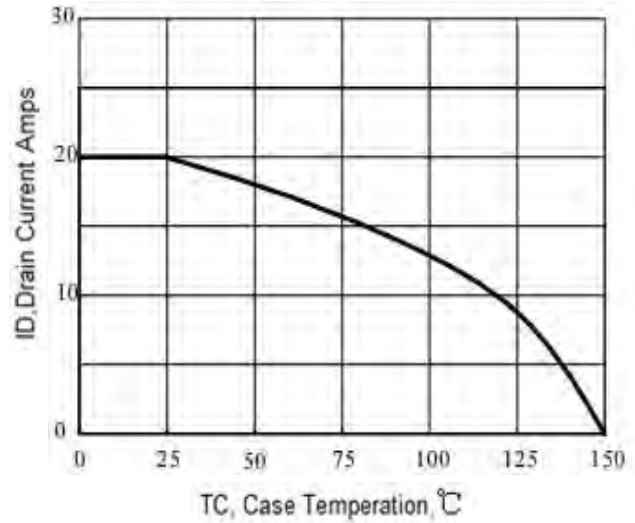
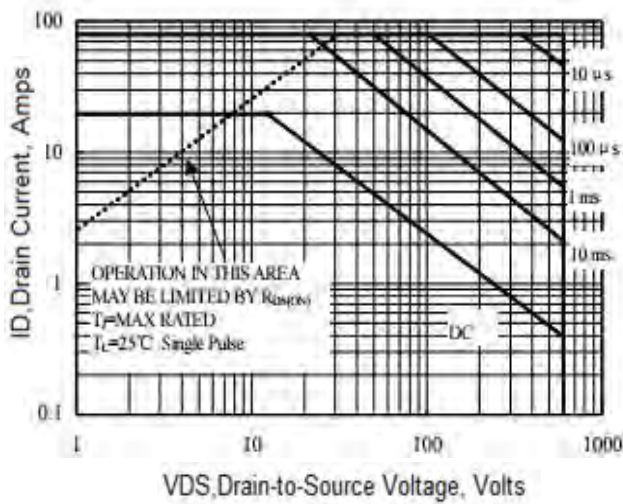
## Source-Drain Diode Characteristics at Ta=25°C unless otherwise specified

Characteristics	Test Condition	Symbol	Min.	Typ.	Max.	Unit
Maximun Body-Diode Continuous Current		$I_S$	-	-	20	A
Maximun Body-Diode Pulsed		$I_{SM}$	-	-	80	A
Drain-Source Diode Forward Voltage	$I_{SD} = 20 A$	$V_{SD}$	-	-	1.4	V
Reverse Recovery Time(Note2)	$I_{SD} = 20 A, V_{GS} = 0 V, di_F / dt = 100 A/\mu s$	$t_{rr}$	-	590	-	ns
Reverse Recovery Charge(Note2)		$Q_{rr}$	-	6.8	-	μC

Note2:Pulse test: 300 μs pulse width, 2 % duty cycle

# CS20N65A

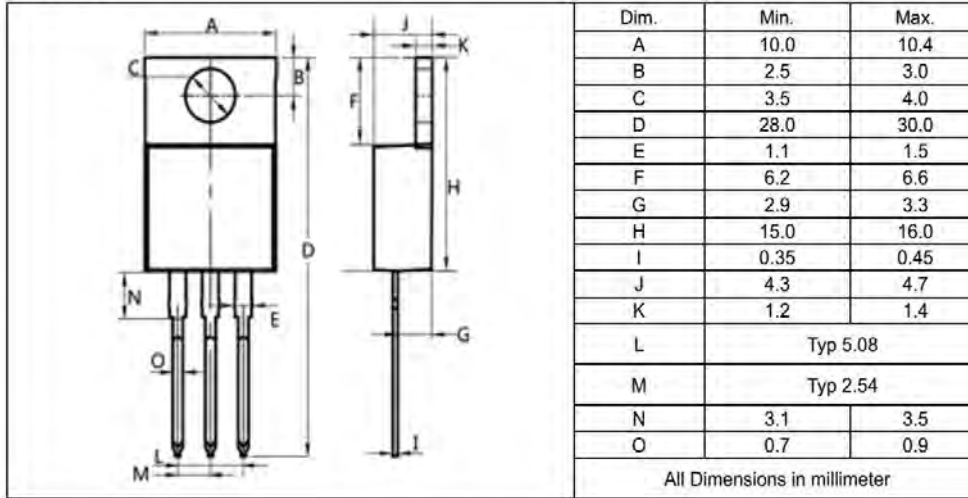
## RATINGS AND CHARACTERISTIC CURVES



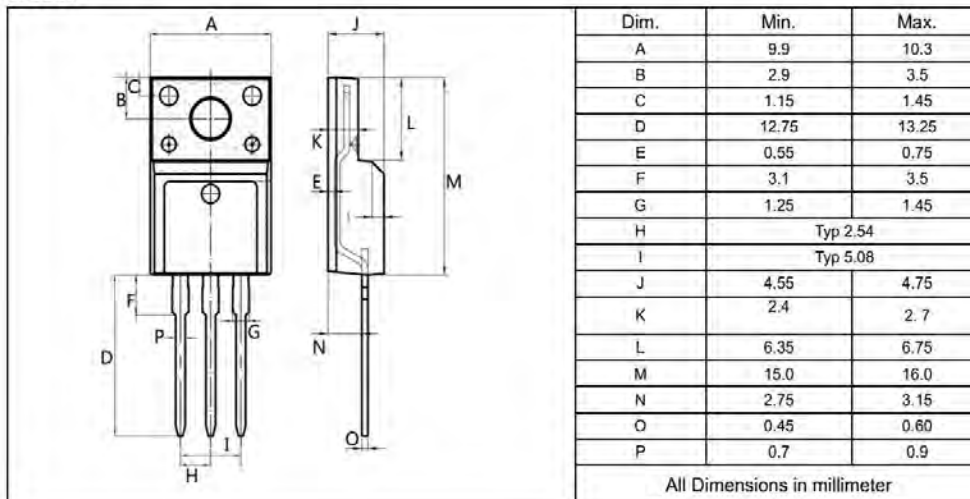
# CS20N65A

Package Outline Dimensions millimeters

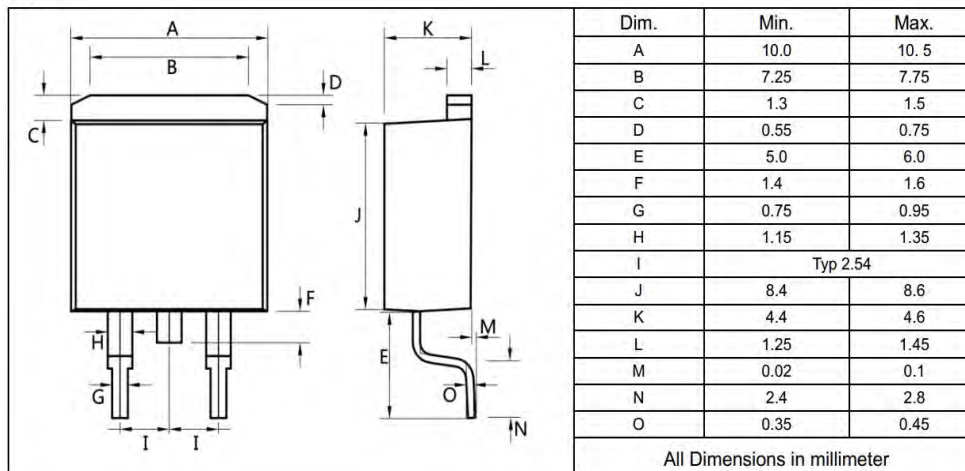
TO-220AB



TO-220F

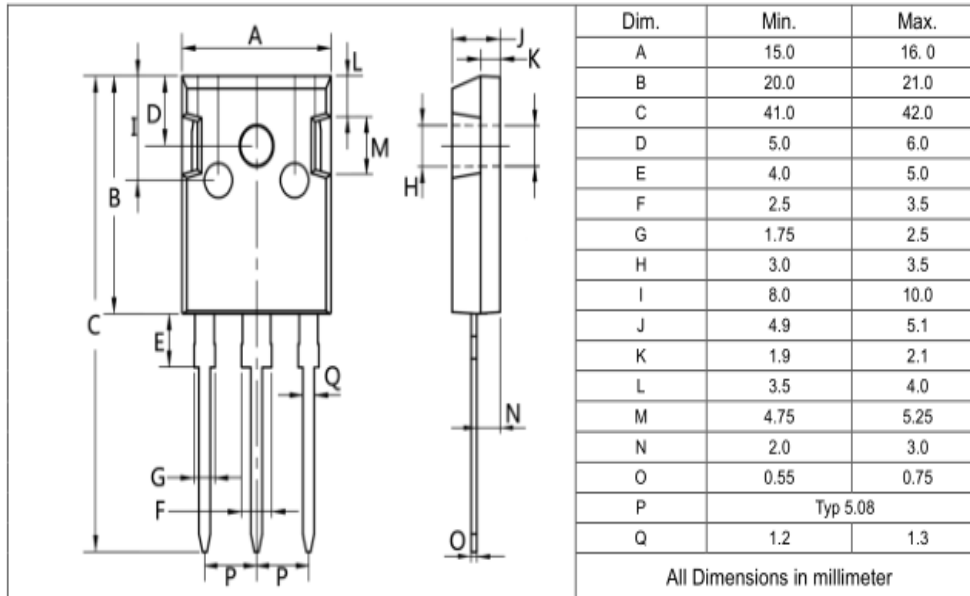


TO-263



# CS20N65A

## Package Outline Dimensions millimeters

**TO-247**

**TO-247S**
