

### MAIN CHARACTERISTICS

$I_D$	20A
$V_{DSS}$	600V
$R_{DS(on)-typ}$ (@ $V_{GS}=10V$ )	0.34 $\Omega$

### FEATURES

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

### APPLICATIONS

- Power switch circuit of adaptor and charger.

### MECHANICAL DATA

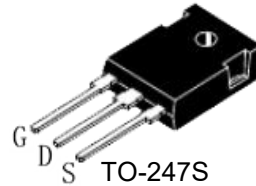
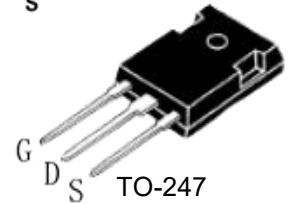
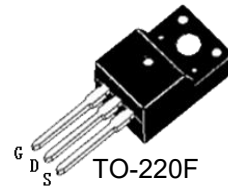
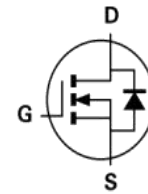
- Case: Molded plastic
- Mounting Position: Any
- Molded Plastic: UL Flammability Classification

Rating 94V-0

- Lead free in compliance with EU RoHS 2011/65/EU

### Product specification classification

Part Number	Package	Mode Name	Pack
CS20N60A8	TO-220F (1.3mm)	CS20N60A	Tube
CS20N60A6	TO-247	CS20N60A	Tube
CS20N60A7	TO-247S	CS20N60A	Tube



## N-Channel Enhancement Mode Power MOSFET

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

Characteristics	Symbol	Value		Unit
		220F	247/247S	
Drain-Source Voltage	$V_{DS}$	600		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	$P_D$	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	$R_{\theta JC}$	2.78	0.5	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	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	$V_{GS} = 0 V, I_D = 250 \mu A$	$BV_{DSS}$	600	-	-	V
Drain-Source Leakage Current	$V_{DS} = 600 V, V_{GS} = 0 V$	$I_{DSS}$	-	-	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	$V_{GS} = 10 V, I_D = 10 A$	$R_{DS(on)}$	-	0.34	0.45	Ω
Forward Transconductance	$V_{DS} = 15 V, I_D = 10 A$	gfs	-	17	-	S
Input Capacitance	$V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz$	$C_{iss}$	-	2881	-	pF
Output Capacitance		$C_{oss}$	-	253	-	pF
Reverse Transfer Capacitance		$C_{rss}$	-	22	-	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)		$t_r$	-	72	-	ns
Turn-Off Delay Time(Note2)		$t_{d(OFF)}$	-	160	-	ns
Fall Time(Note2)		$t_f$	-	72	-	ns
Total Gate Charge(Note2)	$I_D = 20 A, V_{DD} = 400 V, V_{GS} = 10 V$	$Q_G$	-	61	-	nC
Gate to Source Charge(Note2)		$Q_{GS}$	-	15	-	nC
Gate to Drain Charge(Note2)		$Q_{GD}$	-	23	-	nC

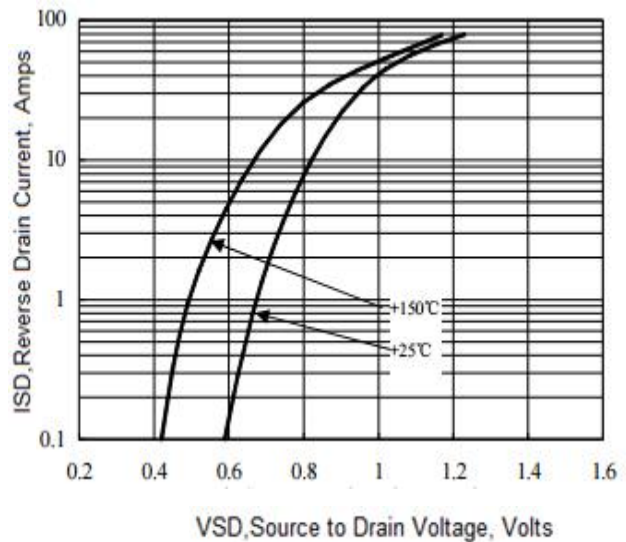
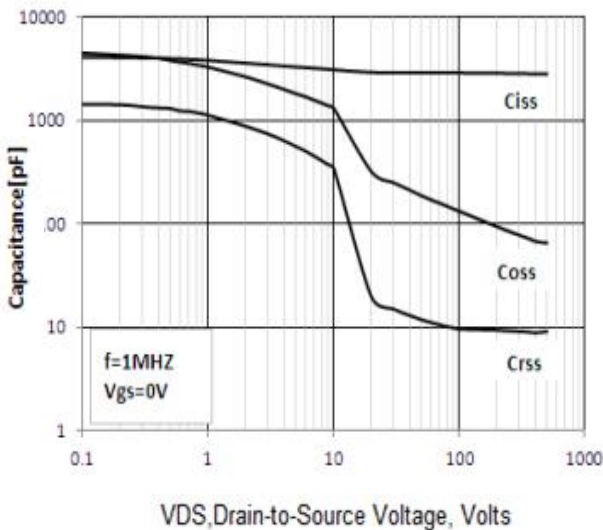
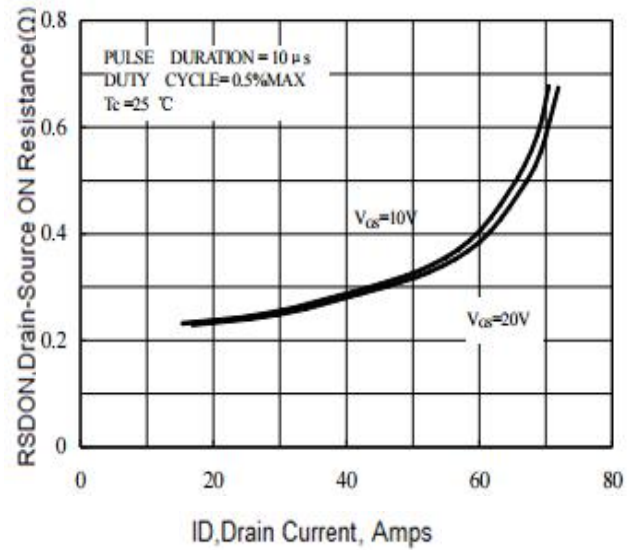
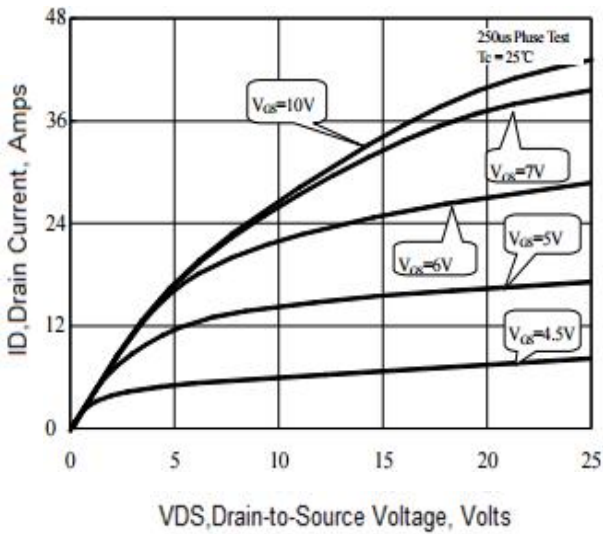
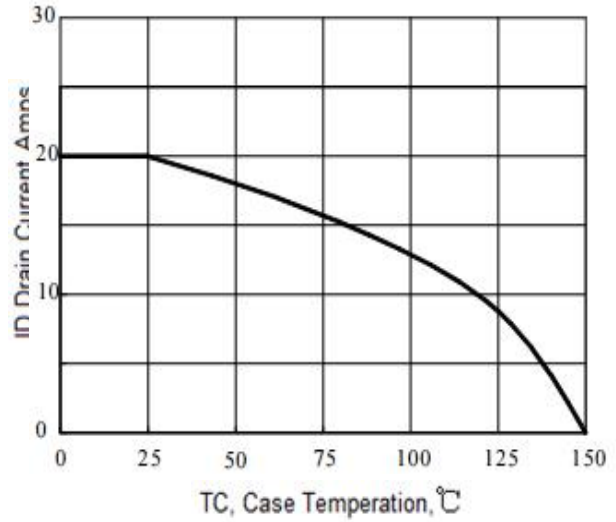
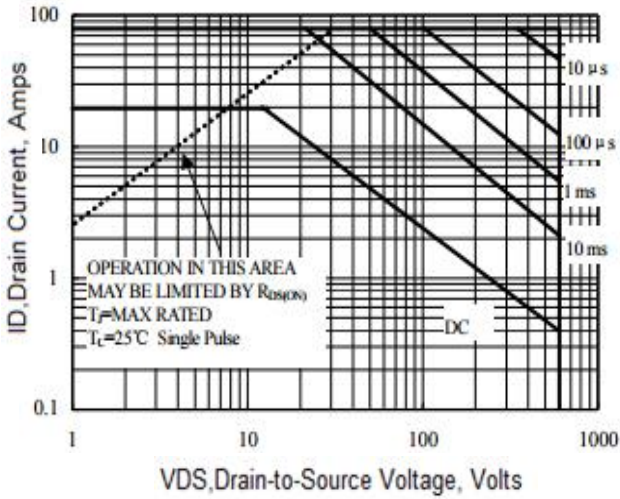
### Source-Drain Diode Characteristics at Ta=25°C unless otherwise specified

Characteristics	Test Condition	Symbol	Min.	Typ.	Max.	Unit
Maximun Body-Diode Continuous Current		$I_S$	-	-	20	A
Maximun Body-Diode Pulsed Current(Note2)		$I_{SM}$	-	-	80	A
Drain-Source Diode Forward Voltage	$I_{SD} = 20 A$	$V_{SD}$	-	-	1.4	V
Reverse Recovery Time(Note2)	$I_{SD} = 20 A, V_{GS} = 0 V, dI_F / dt = 100 A/\mu s$	trr	-	422	-	ns
Reverse Recovery Charge(Note2)		Qrr	-	3.6	-	μC

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

# N-Channel Enhancement Mode Power MOSFET

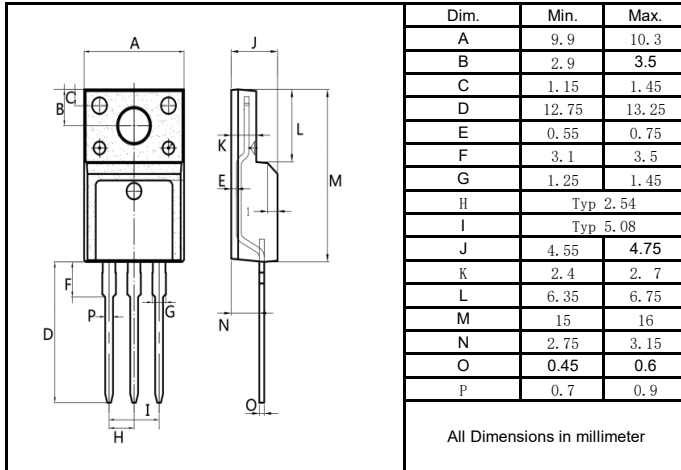
## RATINGS AND CHARACTERISTIC CURVES



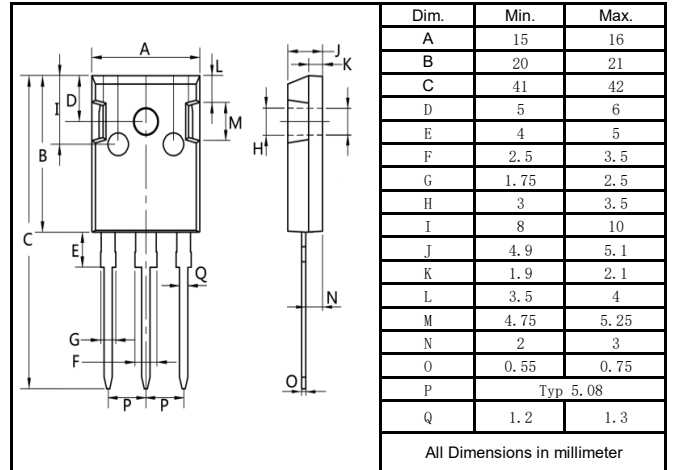
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## Package Outline Dimensions millimeters

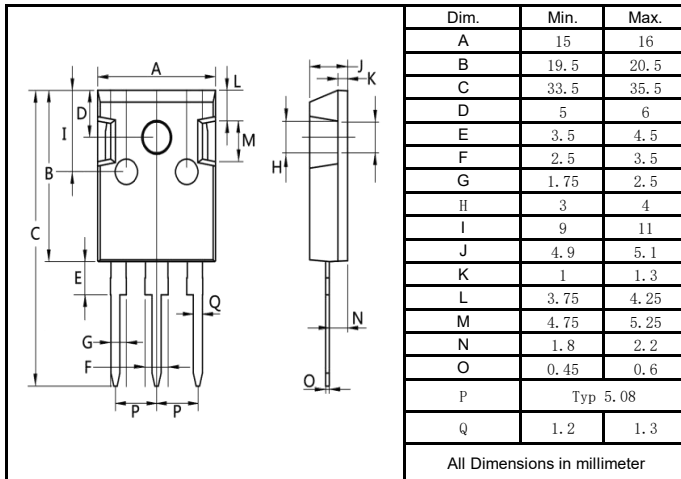
T0-220F



T0-247



T0-247S



Notice