

MAIN CHARACTERISTICS

I_D	12A
V_{DSS}	650V
$R_{DS(on)-typ}$ (@ $V_{GS}=10V$)	0.59 Ω

FEATURES

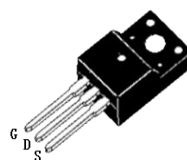
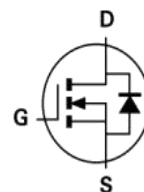
- Fast Switching
- Low ON Resistance
- Low Gate Charge
- 100% Single Pulse avalanche energy Test

APPLICATIONS

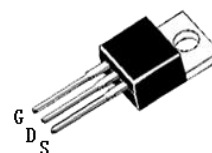
- Power switch circuit of adaptor and charger.

MECHANICAL DATA

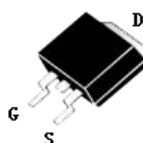
- Case: Molded plastic
- Mounting Position: Any
- Molded Plastic: UL Flammability Classification Rating 94V-0
- Lead free in compliance with EU RoHS 2011/65/EU directive
- Solder bath temperature 275°C maximum, 10s per JESD 22-B106



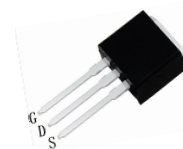
TO-220F



TO-220AB



TO-263



TO-262

Product specification classification

Part Number	Package	Mode Name	Pack
CS12N65A2	TO-220F (0.5mm)	CS12N65A	Tube
CS12N65A8	TO-220F (1.3mm)	CS12N65A	Tube
CS12N65A1	TO-220AB	CS12N65A	Tube
CS12N65A3	TO-263	CS12N65A	Tube
CS12N65A3-R	TO-263	CS12N65A	Tube
CS12N65A0	TO-262	CS12N65A	Tube

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbol	Value		Unit
		220F	220AB/263/262	
Drain-Source Voltage	V_{DS}	650		V
Gate-Source Voltage	V_{GS}	± 30		V
Continue Drain Current	I_D	12		A
Pulsed Drain Current (Note1)	I_{DM}	48		A
Power Dissipation	P_D	42	150	W
Single Pulse Avalanche Energy (Note2)	E_{AS}	750		mJ
Operating Temperature Range	T_J	150		°C
Storage Temperature Range	T_{STG}	-55 to +150		°C
Thermal Resistance, Junction to	$R_{\theta JC}$	2.98	0.83	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62.5	62.5	°C/W

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

Electrical Characteristics at Tc=25°C unless otherwise specified

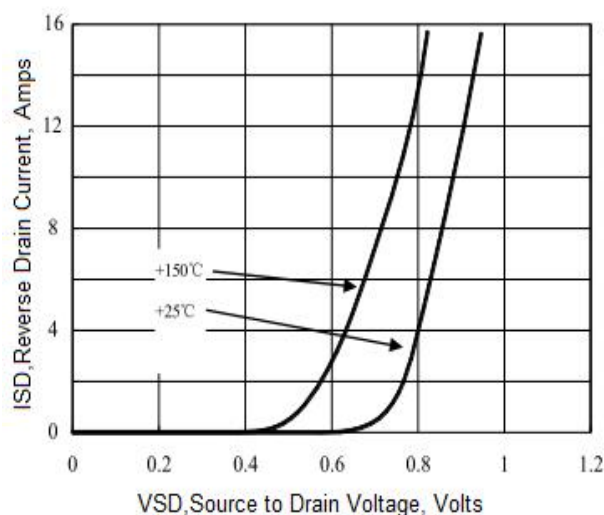
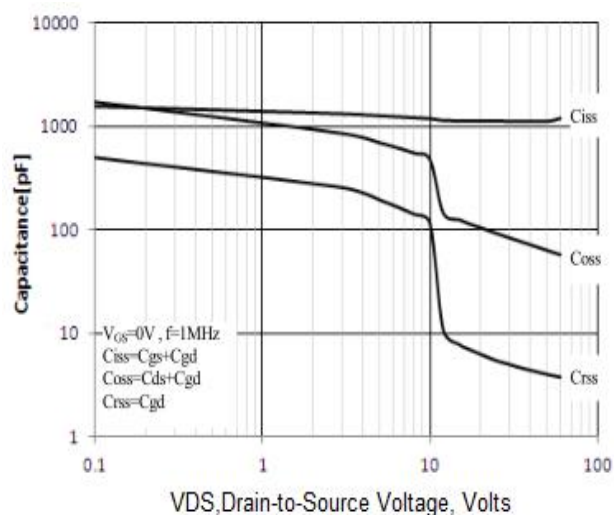
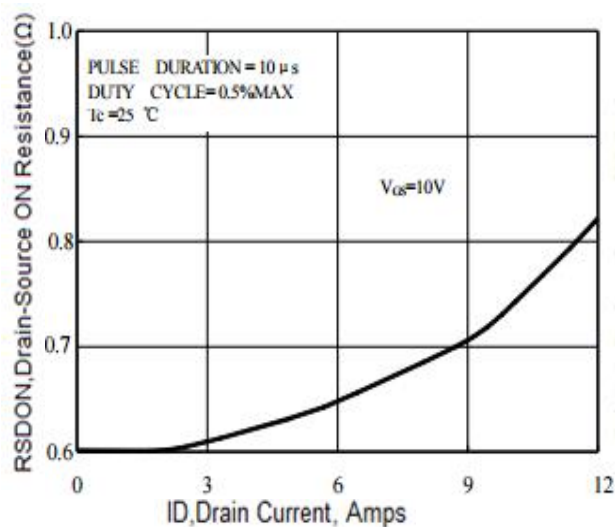
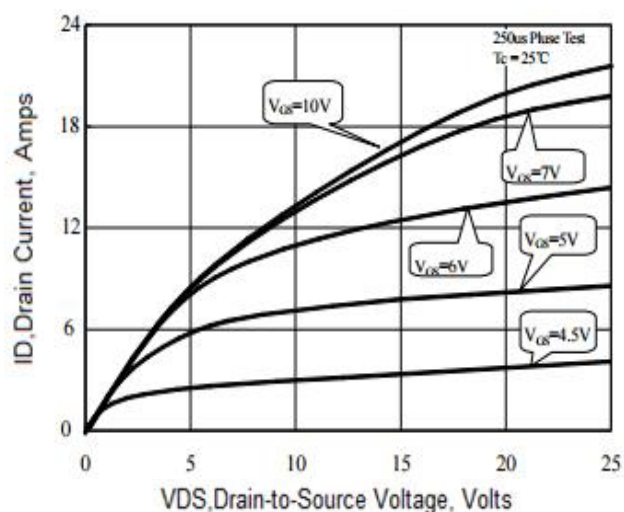
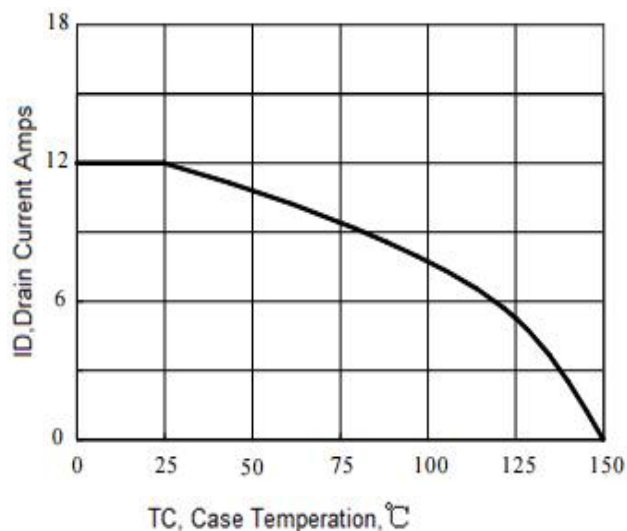
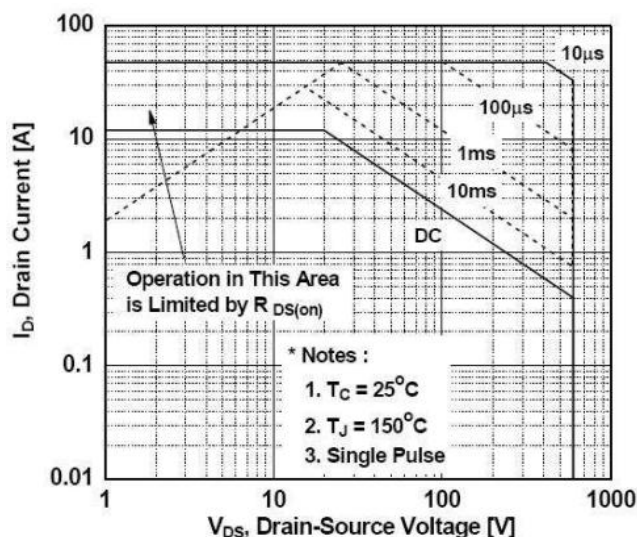
Characteristics	Test Condition	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = 0 \text{ V}, I_D = 250 \mu\text{A}$	BV_{DSS}	650	690	-	V
Drain-Source Leakage Current	$V_{DS} = 650 \text{ V}, V_{GS} = 0 \text{ V}$	I_{DSS}	-	-	1	μA
	$V_{DS} 520 \text{ V}, T_C = 125^\circ\text{C}$		-	-	10	μA
Gate Leakage Current	$V_{GS} = \pm 30 \text{ V}, V_{DS} = 0 \text{ V}$	I_{GSS}	-	-	± 100	nA
Gate-Source Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250 \mu\text{A}$	$V_{GS(th)}$	2	-	4	V
Drain-Source On-State Resistance	$V_{GS} = 10 \text{ V}, I_D = 6 \text{ A}$	$R_{DS(on)}$	-	0.59	0.74	Ω
Forward Transconductance	$V_{DS} = 40 \text{ V}, I_D = 6 \text{ A}$	g_{fs}	-	11	-	S
Input Capacitance	$V_{GS} = 0 \text{ V}, V_{DS} = 25 \text{ V}, f = 1 \text{ MHz}$	C_{iss}	-	2450	-	pF
Output Capacitance		C_{oss}	-	140	-	pF
Reverse Transfer Capacitance		C_{rss}	-	9	-	pF
Turn-on Delay Time	$I_D = 12 \text{ A}, V_{DD} = 325 \text{ V}, R_G = 10 \Omega \text{ (Note3,4)}$	$t_{d(ON)}$	-	29	-	ns
Rise Time		t_r	-	27	-	ns
Turn-Off Delay Time		$t_{d(OFF)}$	-	65	-	ns
Fall Time		t_f	-	46	-	ns
Total Gate Charge	$I_D = 12 \text{ A}, V_{DD} = 520 \text{ V}, V_{GS} = 10 \text{ V} \text{ (Note3,4)}$	Q_G	-	50	-	nC
Gate to Source Charge		Q_{GS}	-	10	-	nC
Gate to Drain Charge		Q_{GD}	-	14	-	nC

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

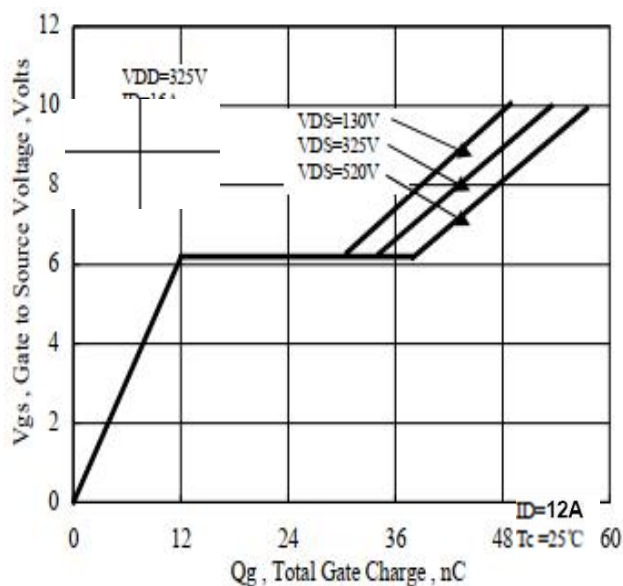
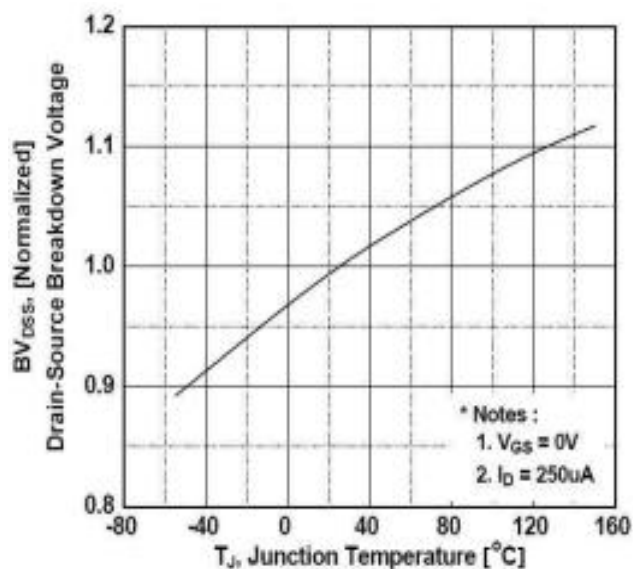
Characteristics	Test Condition	Symbol	Min.	Typ.	Max.	Unit
Maximun Body-Diode Continuous Current		I_S	-	-	12	A
Maximun Body-Diode Pulsed Current		I_{SM}	-	-	48	A
Drain-Source Diode Forward Voltage	$I_{SD} = 12 \text{ A}$	V_{SD}	-	-	1.5	V
Reverse Recovery Time	$I_{SD} = 12 \text{ A}, V_{GS} = 0 \text{ V},$	t_{rr}	-	670	-	ns
Reverse Recovery Charge	$dl_F / dt = 100 \text{ A}/\mu\text{s} \text{ (Note3)}$	Q_{rr}	-	4.4	-	μC

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

RATINGS AND CHARACTERISTIC CURVES

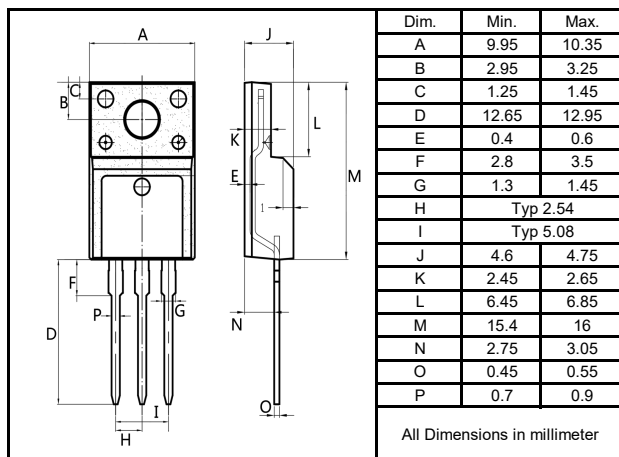


RATINGS AND CHARACTERISTIC CURVES

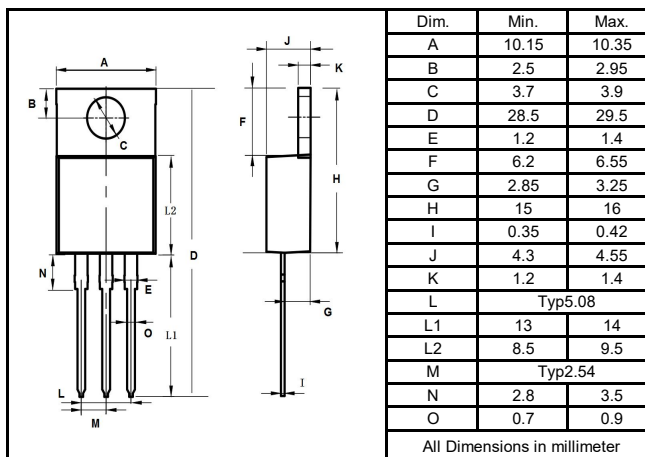


Package Outline Dimensions millimeters

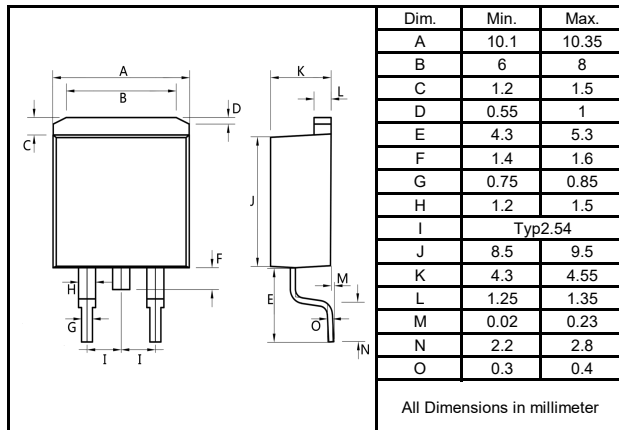
T0-220F



T0-220AB



T0-263



T0-262

