

MAIN CHARACTERISTICS

I_D	5A
V_{DSS}	650V
$R_{DS(on)-typ}$ (@ $V_{GS}=10V$)	2.0 Ω

FEATURES

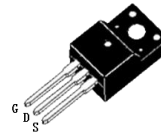
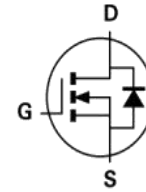
- Fast Switching
- Low ON Resistance
- Low Gate Charge
- 100% Single Pulse avalanche energy Test

APPLICATIONS

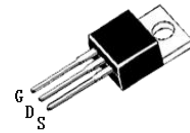
- Power switch circuit of adaptor and charger.

MECHANICAL DATA

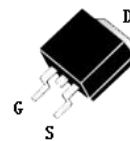
- Case: Molded plastic
- Mounting Position: Any
- Molded Plastic: UL Flammability Classification Rating 94V-0
- Lead free in compliance with EU RoHS 2011/65/EU directive
- Solder bath temperature 275°C maximum, 10s per JESD 22-B106



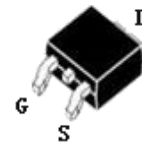
TO-220F



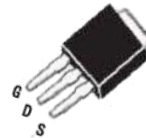
TO-220AB



TO-263



TO-252



TO-251

Product specification classification

Part Number	Package	Mode Name	Pack
CS5N65A2	TO-220F (0.5mm)	CS5N65A	Tube
CS5N65A1	TO-220AB	CS5N65A	Tube
CS5N65A3	TO-263	CS5N65A	Tube
CS5N65A3-R	TO-263	CS5N65A	Tape
CS5N65A5-R	TO-252	CS5N65A	Tape
CS5N65A4	TO-251	CS5N65A	Tube

CS5N65A



N-Channel Enhancement Mode Power MOSFET

Maximum Ratings at $T_c=25^{\circ}\text{C}$ unless otherwise specified

Characteristics	Symbol	Value			Unit
		220AB/263	220F	251/252	
Drain-Source Voltage	V_{DS}	650			V
Gate-Source Voltage	V_{GS}	± 30			V
Continue Drain Current	I_D	5			A
Pulsed Drain Current (Note1)	I_{DM}	20			A
Power Dissipation	P_D	85	30	85	W
Single Pulse Avalanche Energy (Note1)	E_{AS}	150			mJ
Operating Temperature Range	T_J	150			$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-55 to +150			$^{\circ}\text{C}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.67	4.17	1.67	$^{\circ}\text{C/W}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62.5	100	62.5	$^{\circ}\text{C/W}$

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

Electrical Characteristics at $T_c=25^{\circ}\text{C}$ unless otherwise specified

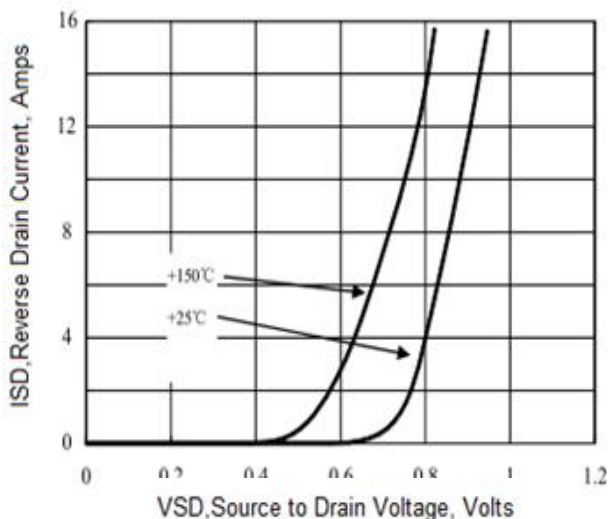
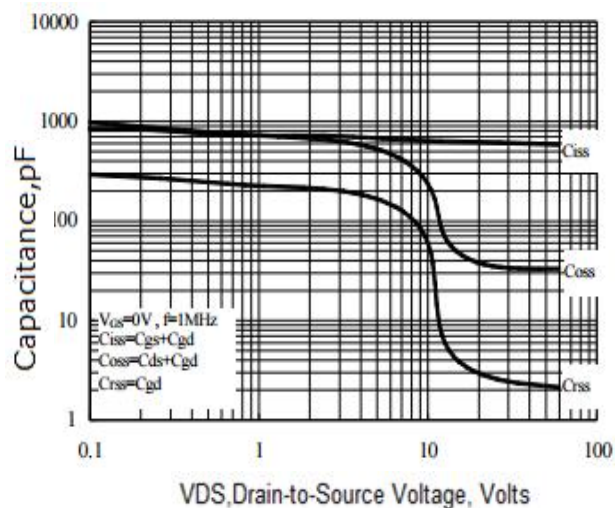
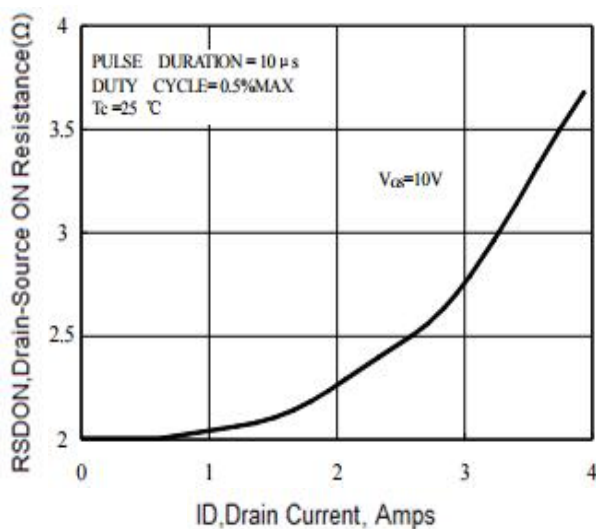
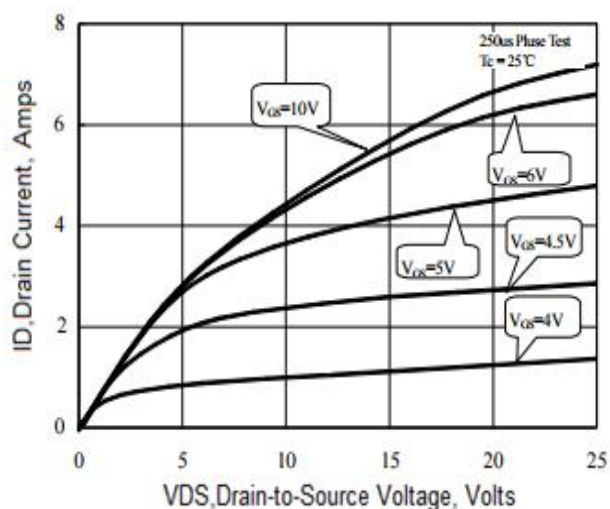
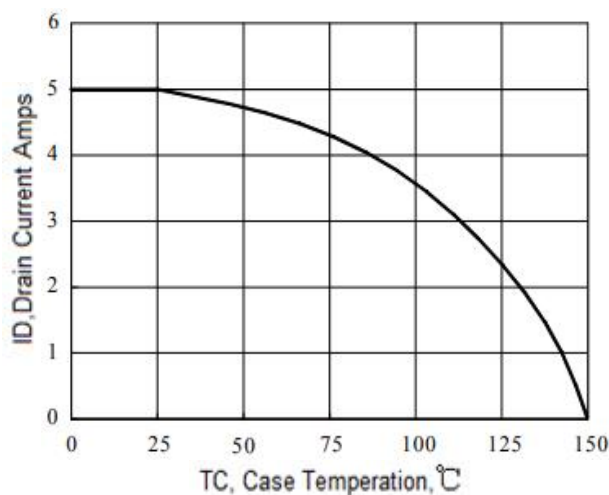
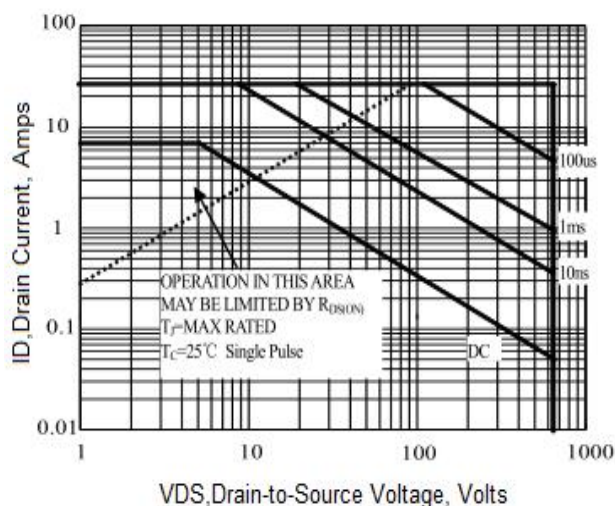
Characteristics	Test Condition	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	BV_{DSS}	650	680	-	V
Drain-Source Leakage Current	$V_{DS} = 650\text{ V}, V_{GS} = 0\text{ V}$	I_{DSS}	-	-	1	μA
Gate Leakage Current	$V_{GS} = \pm 30\text{ V}, V_{DS} = 0\text{ V}$	I_{GSS}	-	-	± 100	nA
Gate-Source Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	$V_{GS(th)}$	2	-	4	V
Drain-Source On-State Resistance	$V_{GS} = 10\text{ V}, I_D = 2\text{ A}$	$R_{DS(on)}$	-	2.0	2.4	Ω
Forward Transconductance	$V_{DS} = 15\text{ V}, I_D = 2\text{ A}$	g_{fs}	-	3.5	-	S
Input Capacitance	$V_{GS} = 0\text{ V}, V_{DS} = 2\text{ V},$ $f = 200\text{ KHz}$	C_{iss}	-	623	-	pF
Output Capacitance		C_{oss}	-	55	-	pF
Reverse Transfer Capacitance		C_{rss}	-	8.5	-	pF
Turn-on Delay Time(Note2)	$I_D = 4\text{ A}, V_{DD} = 325\text{ V},$ $R_G = 10\text{ }\Omega$	$t_{d(ON)}$	-	8.5	-	ns
Rise Time(Note2)		t_r	-	6.5	-	ns
Turn-Off Delay Time(Note2)		$t_{d(OFF)}$	-	31	-	ns
Fall Time(Note2)		t_f	-	8.5	-	ns
Total Gate Charge(Note2)	$I_D = 4\text{ A}, V_{DD} = 520\text{ V},$ $V_{GS} = 10\text{ V}$	Q_G	-	15	-	nC
Gate to Source Charge(Note2)		Q_{GS}	-	2.8	-	nC
Gate to Drain Charge(Note2)		Q_{GD}	-	6.3	-	nC

Source-Drain Diode Characteristics at $T_a=25^{\circ}\text{C}$ unless otherwise specified

Characteristics	Test Condition	Symbol	Min.	Typ.	Max.	Unit
Maximun Body-Diode Continuous Current		I_S	-	-	5	A
Maximun Body-Diode Pulsed Current(Note2)		I_{SM}	-	-	20	A
Drain-Source Diode Forward Voltage	$I_{SD} = 4\text{ A}$	V_{SD}	-	-	1.5	V
Reverse Recovery Time(Note2)	$I_{SD} = 4\text{ A}, V_{GS} = 0\text{ V},$ dIF /	t_{rr}	-	430	-	ns
Reverse Recovery Charge(Note2)	dt = 100 A/ μs	Q_{rr}	-	1.27	-	μC

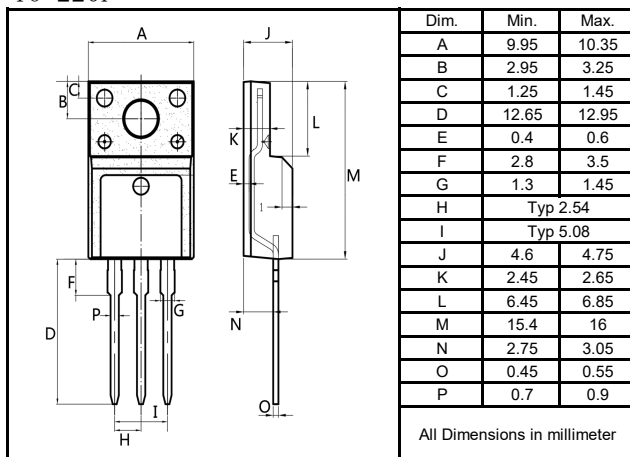
Note2:Pulse test: 300 μs pulse width, 2 % duty cycle

RATINGS AND CHARACTERISTIC CURVES

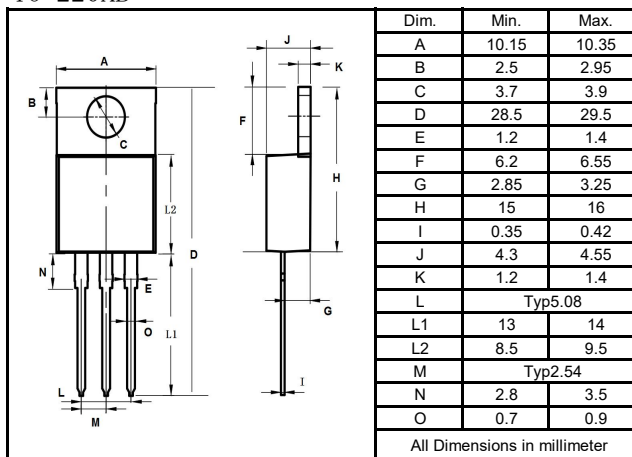


Package Outline Dimensions millimeters

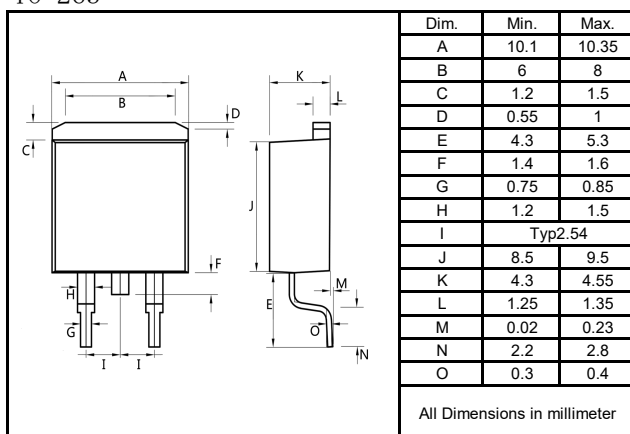
T0-220F



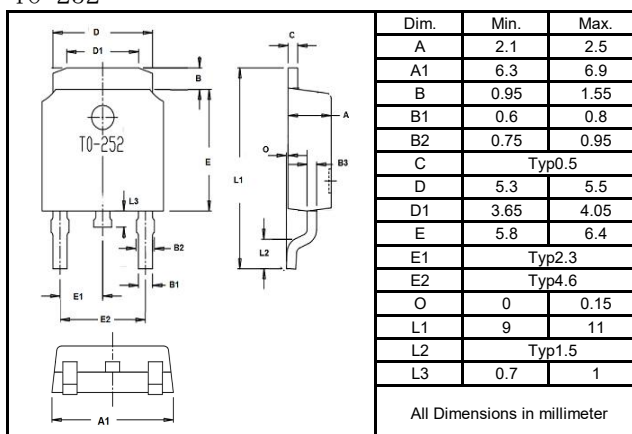
T0-220AB



T0-263



T0-252



T0-251

