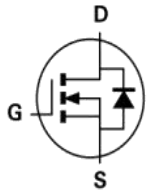
CS10N65A

N-Channel Enhancement Mode Power MOSFET

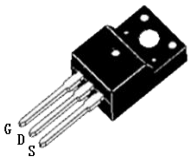
MAIN CHARACTERISTICS

I_D	10A
V_{DSS}	650V
R_{DSON}-typ （@V_{GS}=10V）	0.79Ω



FEATURES

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



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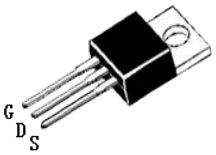

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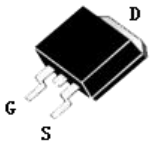
APPLICATIONS

- Power switch circuit of adaptor and charger.



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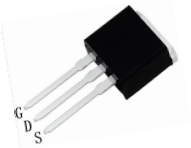

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MECHANICAL DATA

- 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℃ maximum,10s per JESD 22-B106

Product specification classification

Part Number	Package	Mode Name	Pack
CS10N65A2	TO-220F(0.5mm)	CS10N65A	Tube
CS10N65A8	TO-220F(1.3mm)	CS10N65A	Tube
CS10N65A1	TO-220AB	CS10N65A	Tube
CS10N65A3	TO-263	CS10N65A	Tube
CS10N65A3-R	TO-263	CS10N65A	Tube
CS10N65A0	TO-262	CS10N65A	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	10		A
Pulsed Drain Current (Note1)	I_{DM}	40		A
Power Dissipation	P_D	31	150	W
Single Pulse Avalanche Energy (Note2)	E_{AS}	845		mJ
Operating Temperature Range	T_J	150		°C
Storage Temperature Range	T_{STG}	-55 to +150		°C
Thermal Resistance, Junction to	$R_{\theta JC}$	4	0.83	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62.5	62.5	°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 μA	BV_{DSS}	650	690	-	V
Drain-Source Leakage Current	V_{DS} = 650 V, V_{GS} = 0 V	I_{DSS}	-	-	1	μA
	V_{DS}520V,Tc=125°C		-	-	10	μA
Gate Leakage Current	V_{GS} = ± 30 V, V_{DS} = 0 V	I_{GSS}	-	-	±100	nA
Gate-Source Threshold Voltage	V_{DS} = V_{GS} , I_D = 250 μA	$V_{GS(th)}$	2	-	4	V
Drain-Source On-State Resistance	V_{GS} = 10 V, I_D = 5 A	$R_{DS(on)}$	-	0.79	0.95	Ω
Forward Transconductance	V_{DS} = 40V, I_D = 5 A	gfs	-	11	-	S
Input Capacitance	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	C_{iss}	-	1720	-	pF
Output Capacitance		C_{oss}	-	140	-	pF
Reverse Transfer Capacitance		C_{rss}	-	11	-	pF
Turn-on Delay Time	I_D = 10 A, V_{DD} = 325V, R_G= 25 Ω (Note3,4)	$t_{d(ON)}$	-	23	-	ns
Rise Time		t_r	-	15	-	ns
Turn-Off Delay Time		$t_{d(OFF)}$	-	90	-	ns
Fall Time		t_f	-	30	-	ns
Total Gate Charge	I_D = 10 A, V_{DD} = 520 V, V_{GS} = 10 V (Note3,4)	Q_G	-	32	-	nC
Gate to Source Charge		Q_{GS}	-	5	-	nC
Gate to Drain Charge		Q_{GD}	-	16	-	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	-	-	10	A
Maximun Body-Diode Pulsed Current		I_{SM}	-	-	40	A
Drain-Source Diode Forward Voltage	I_{SD} = 10 A	V_{SD}	-	-	1.4	V
Reverse Recovery Time	I_{SD} = 10 A, V_{GS} = 0 V, dI_F / dt = 100 A/μs (Note3)	trr	-	310	-	ns
Reverse Recovery Charge		Qrr	-	4.1	-	μC

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

RATINGS AND CHARACTERISTIC CURVES

Figure1: Output Characteristics

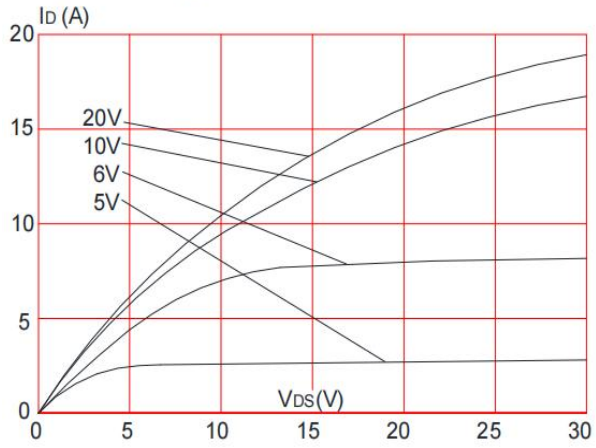


Figure 2: Typical Transfer Characteristics

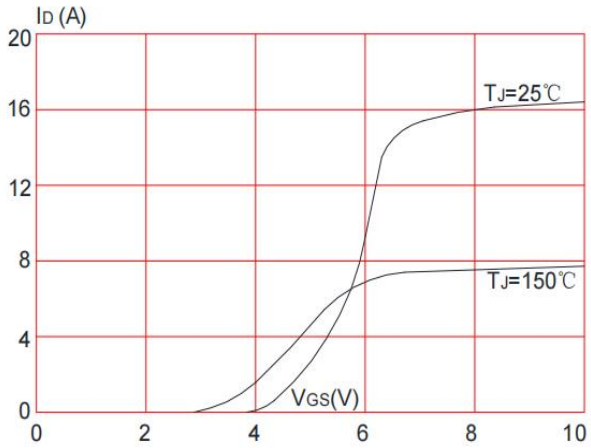


Figure 3: On-resistance vs. Drain Current

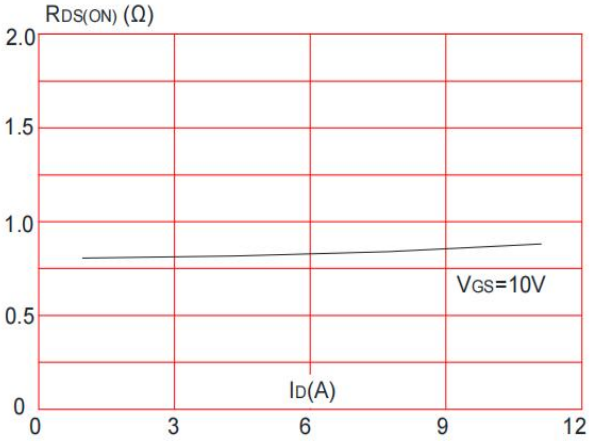


Figure 4: Body Diode Characteristics

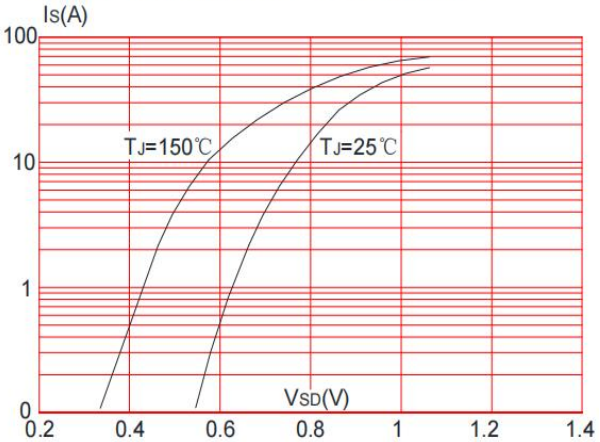


Figure 5: Gate Charge Characteristics

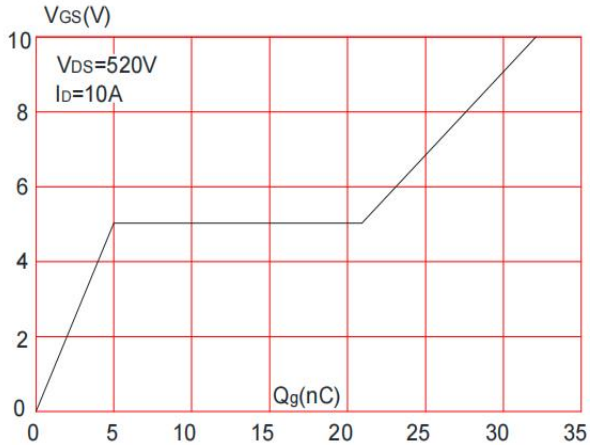
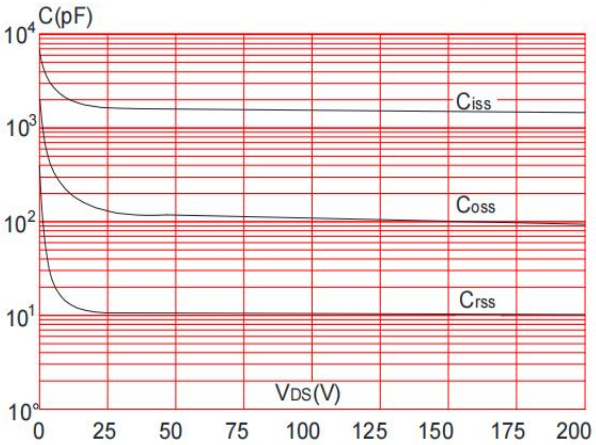


Figure 6: Capacitance Characteristics



RATINGS AND CHARACTERISTIC CURVES

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

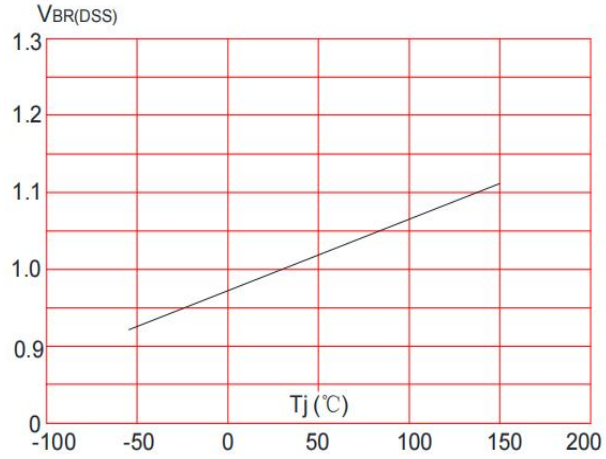


Figure 8: Normalized on Resistance vs. Junction Temperature

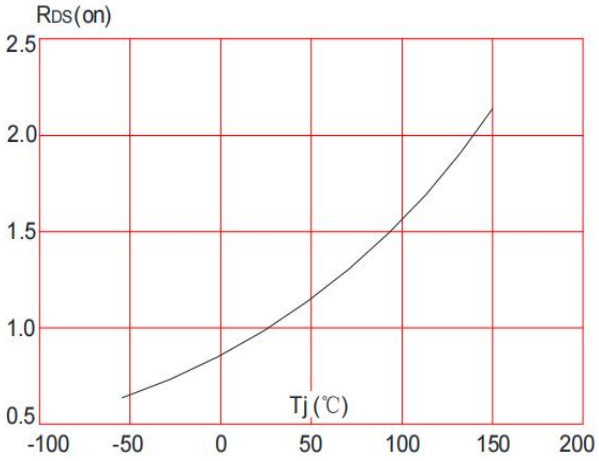


Figure 9: Maximum Safe Operating Area

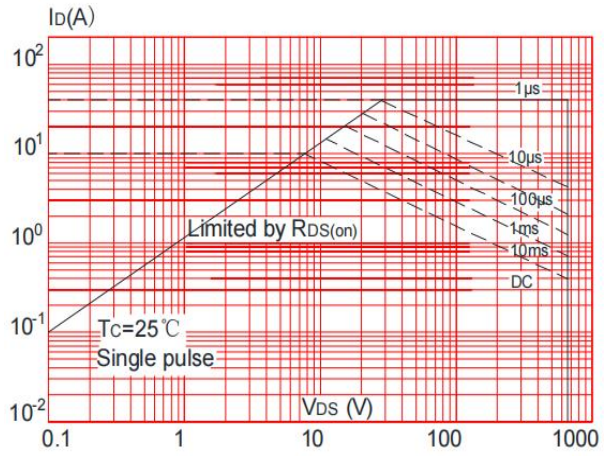


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

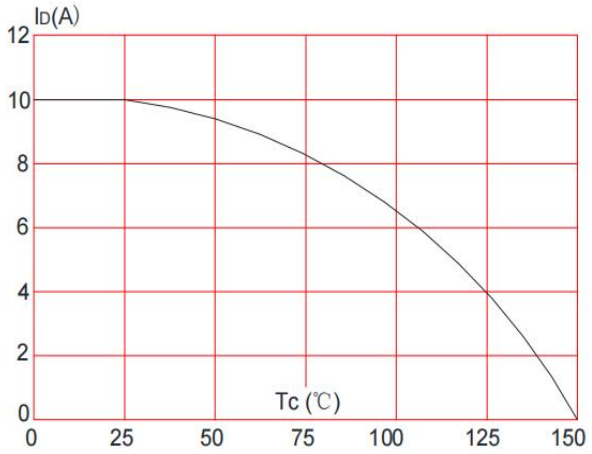
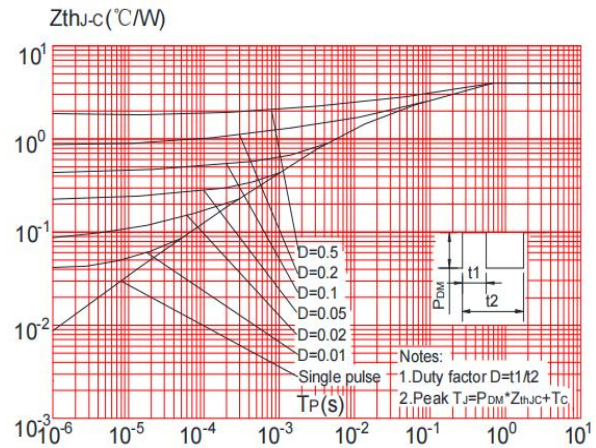


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



Package Outline Dimensions millimeters

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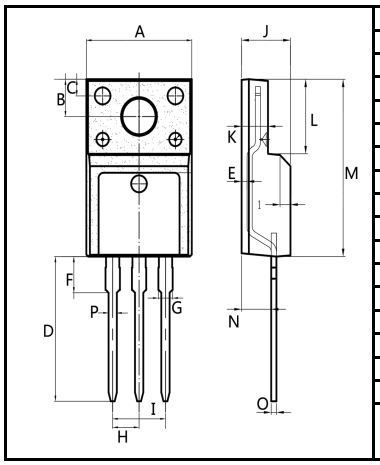
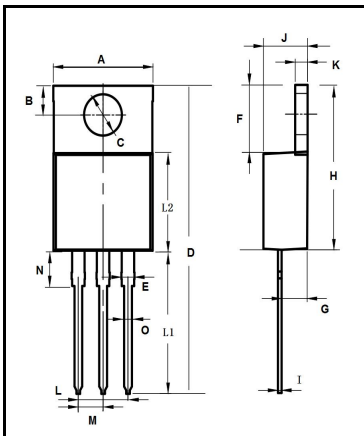


Dim.	Min.	Max.
A	9.95	10.35
B	2.95	3.25
C	1.25	1.45
D	12.65	12.95
E	0.4	0.6
F	2.8	3.5
G	1.3	1.45
H	Typ 2.54	
I	Typ 5.08	
J	4.6	4.75
K	2.45	2.65
L	6.45	6.85
M	15.4	16
N	2.75	3.05
O	0.45	0.55
P	0.7	0.9

All Dimensions in millimeter

TO-220AB



Dim.	Min.	Max.
A	10.15	10.35
B	2.5	2.95
C	3.7	3.9
D	28.5	29.5
E	1.2	1.4
F	6.2	6.55
G	2.85	3.25
H	15	16
I	0.35	0.42
J	4.3	4.55
K	1.2	1.4
L	Typ5.08	
L1	13	14
L2	8.5	9.5
M	Typ2.54	
N	2.8	3.5
O	0.7	0.9

All Dimensions in millimeter

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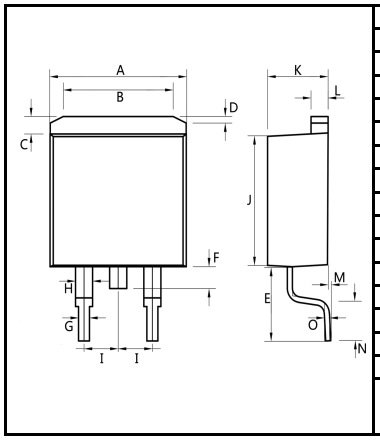

Dim.	Min.	Max.
A	10.1	10.35
B	6	8
C	1.2	1.5
D	0.55	1
E	4.3	5.3
F	1.4	1.6
G	0.75	0.85
H	1.2	1.5
I	Typ2.54	
J	8.5	9.5
K	4.3	4.55
L	1.25	1.35
M	0.02	0.23
N	2.2	2.8
O	0.3	0.4

All Dimensions in millimeter

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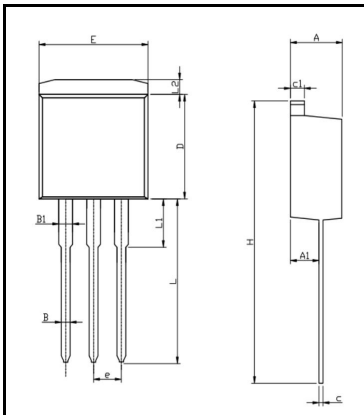

Dim.	Min.	Max.
A	4.4	4.6
A1	2.4	2.6
B	0.75	0.85
B1	1.2	1.4
C	0.35	0.42
C1	1.25	1.35
D	8.5	9.5
E	10.15	10.35
H	23	25
L	13	14
L1	2.8	3.5
L2	1.2	1.5

All Dimensions in millimeter