SEMICONDUCTOR

SJ10N65M

10A 650V N-Channel Enhancement Mode Power MOSFET

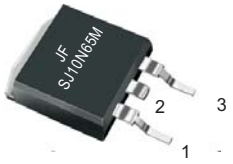
Genaral Description

Power MOSFET is fabticated using advanced super junction technology. The resulting device has extremely low on resistance, making it especially suitable for applications which require superior power density and outstanding efficiency.

Product Summary			
V_{DS}	$R_{DS(on)}$ (Ω) Typ	I_D (A)	Qg (Typ)
650V	0. 55 @ 10V	4	13. 1nc

TO-252

SJ10N65M



Features

- Low on-resistance
- Low gate charge and input capacitance
- 100% avalanche tested

Application

- Power faction correction (PFC)
- Switched mode power supplies (SMPS)
- Uninterruptible power supply (UPS)

Ordering Information

Part No.	Package Type	Package	Quality(box)
SJ10N65M	TO-252	Tape & Reel	3000

Pin Definition:

1. Gate
2. Drain
3. Source

Block Diagram

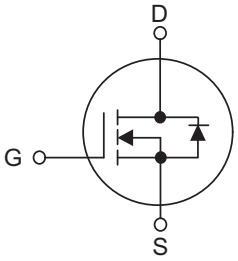


Table1 Absolute Maximum Ratings (T_C=25 C, unless otherwise specified)

Parameter		Symbol	SJ10N65M	Unit
Drain-Source Voltage		V_{DS}	650	V
Gate-Source Voltage		V_{GS}	±30	V
Continuous Drain Current	T_C=25°C	I_D	10	A
	T_C=100°C		4.4	
Pulsed Drain Current (Note 1)		I_{DM}	21	A
Single Pulse Avalanche Energy(Note 2)		E_{AS}	120	mJ
Avalanche Current(Note 1)		I_{AR}	10	A
Power Dissipation T_C=25°C		P_D	63	W
Operating Junction and Storage Temperature		T_J/T_{STG}	-55 ~ +150	C

Table 2.Thermal Characteristics

Parameter	Symbol	SJ10N65M	Unit
Thermal resistance Junction to Ambient	$R_{\theta JA}$	62.5	C/W
Thermal resistance Junction to Case	$R_{\theta JC}$	2	C/W

Table 3. Electrical Characteristics (T_J=25 C, unless otherwise specified)

Parameter		Symbol	Test Conditions	Min	Typ	Max	Unit
Off Characteristics							
Drain-Source Breakdown Voltage		BV_{DSS}	V_{GS}=0V,I_D=250μA	650			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=650V,V_{GS}=0V			1	μA
Gate- Source Leakage Current	Forward	I_{GSS}	V_{GS}=30V,V_{DS}=0V			50	nA
	Reverse		V_{GS}=-30V,V_{DS}=0V			-50	nA
On Characteristics(Note 4)							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}=V_{GS},I_D=250μA	2.5	3.5	4.5	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	V_{GS}=10V,I_D=4A		0.55	0.65	Ω
Dynamic Characteristics(Note 5)							
Input Capacitance		C_{ISS}	V_{DS}=25V,V_{GS}=0V,f=1MHz		480		pF
Output Capacitance		C_{OSS}			325		pF
Reverse Transfer Capacitance		C_{RSS}			0.95		pF
Switching Characteristics (Note 5)							
Turn-On Delay Time		td(on)	V_{DD}=300V,I_D=4A, V_{GS}=15V,R_G=10Ω		12		ns
Turn-On Rise Time		t_R			6.13		ns
Turn-Off Delay Time		td(off)			26		ns
Turn-Off Fall Time		tf			3.3		ns
Total Gate Charge		Q_G	V_{DD}=480V,I_D=4A, V_{GS}=10V		13.1		nC
Gate-Source Charge		Q_{GS}			4.2		nC
Gate-Drain Charge		Q_{GD}			4.0		nC
Drain-Source Diode Characteristics and Maximum Ratings							
Drain-Source Diode Forward Voltage		V_{SD}	V_{GS}=0V, I_S=4A		0.85		V
Maximum Continuous Drain-Source Diode Forward Current		I_S				10	A
Reverse Recovery Time		trr	V_R=50V, I_F=4A dI$_F$/dt=100A/μs (Note 1)		200		ns
Reverse Recovery Charge		Q_{RR}			1600		nC

Notes : 1 Repetitive Rating:Pulse width limited by maximum junction temperature
2 I_{AS}=2A,V_{DD}=50V,Starting T_J=25°C
4 Pulse Test: Pulse width ≤300μS, Duty cycle≤2%
5 Guaranteed by design,not subject to production

Typical Characteristics Diagrams

Figure 1. On-Region Characteristics

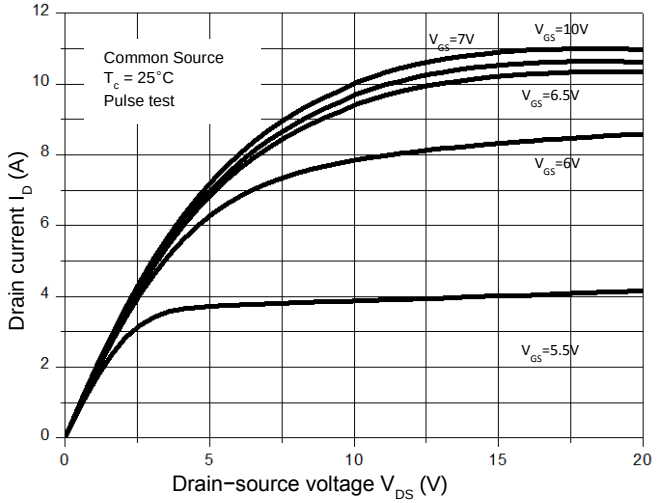


Figure 2. Transfer Characteristics

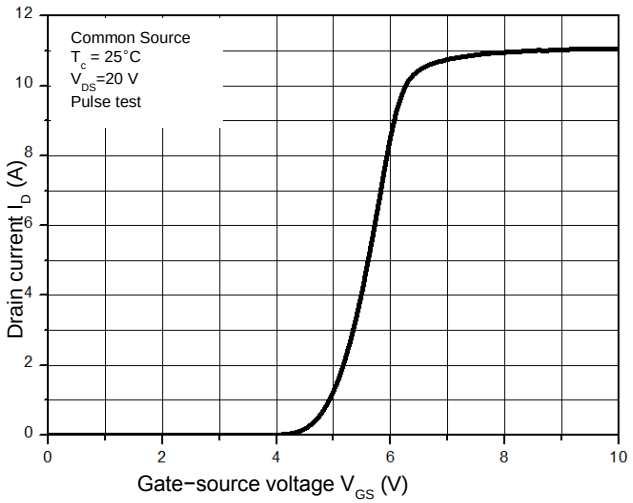


Figure 3. On-Resistance Variation vs. Drain Current

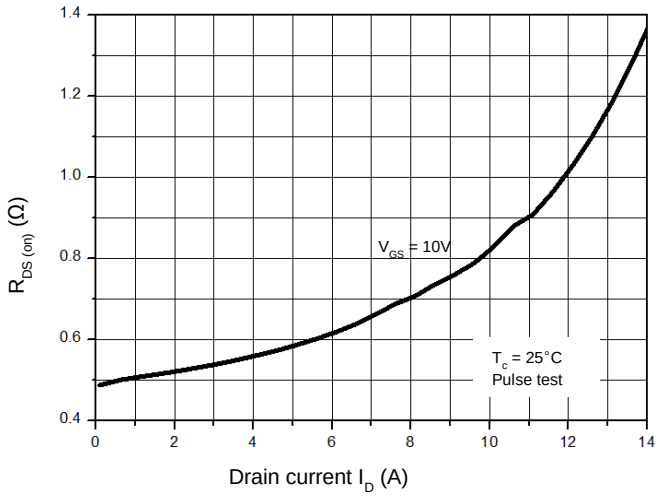


Figure 4. Threshold Voltage vs. Temperature

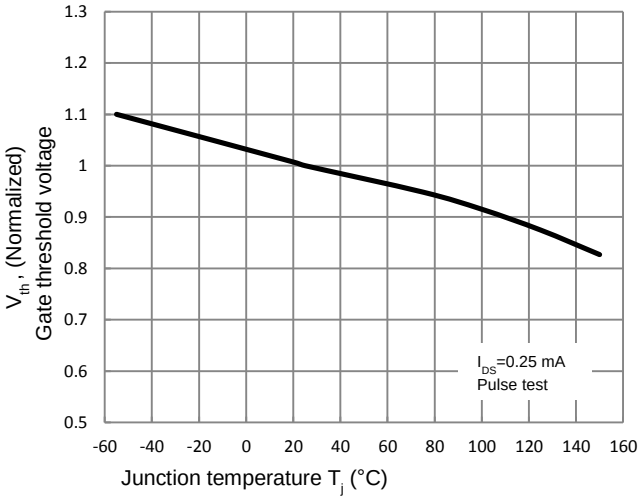


Figure 5. Breakdown Voltage vs. Temperature

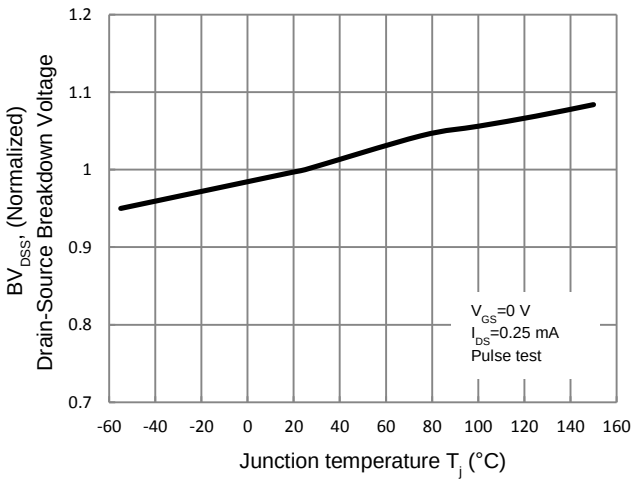
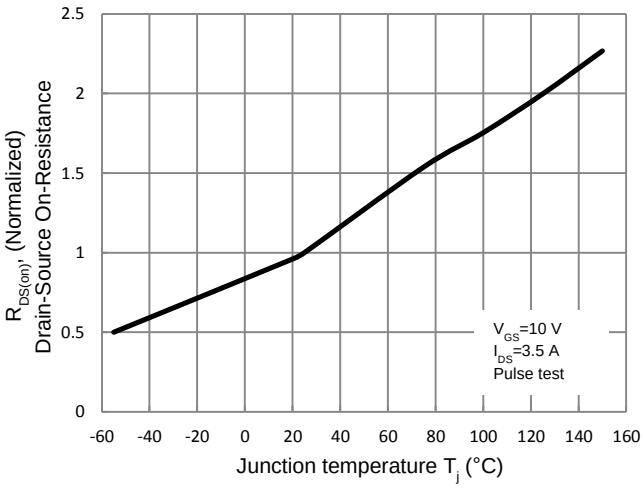


Figure 6. On-Resistance vs. Temperature



Typical Characteristics Diagrams

Figure 7. Capacitance Characteristics

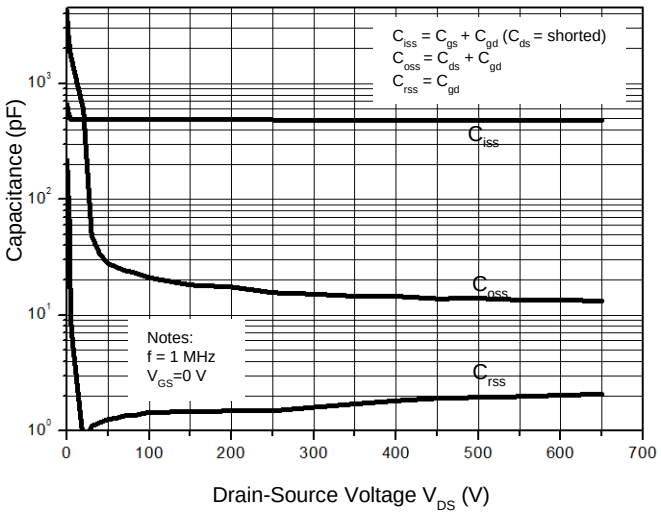


Figure 8. Gate Charge Characterist

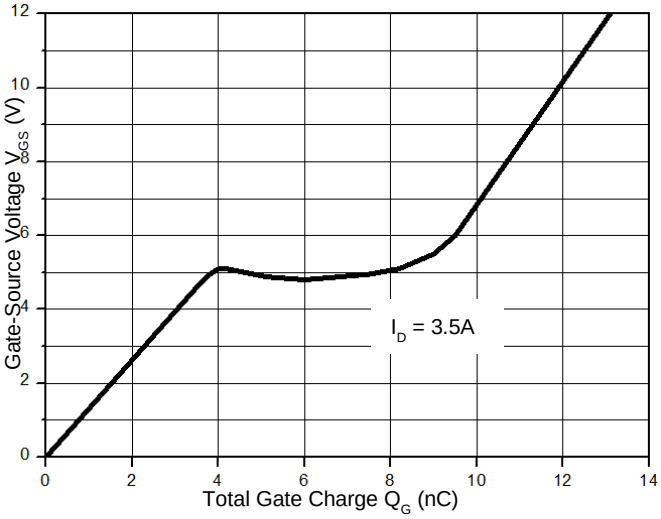


Figure 9. Maximum Safe Operating Area

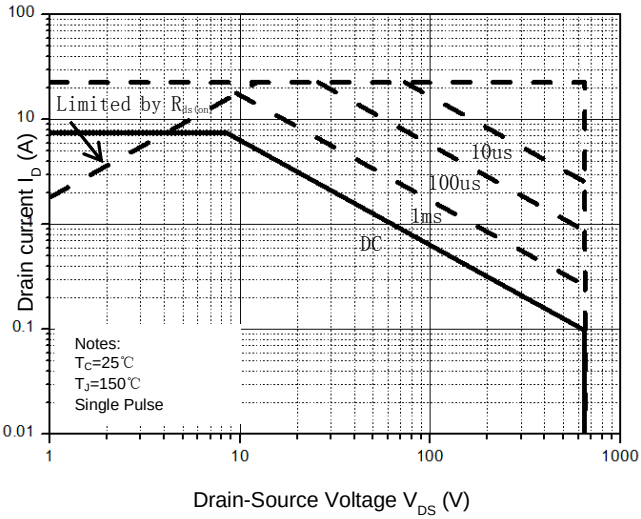
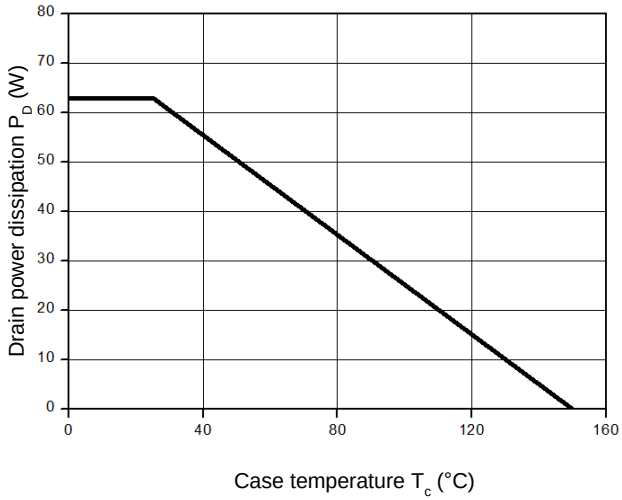
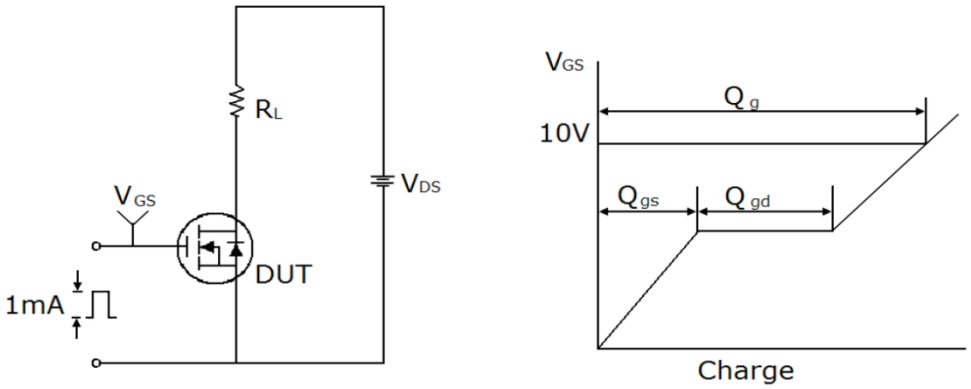


Figure 10. P ower Dissipation vs. Temperature

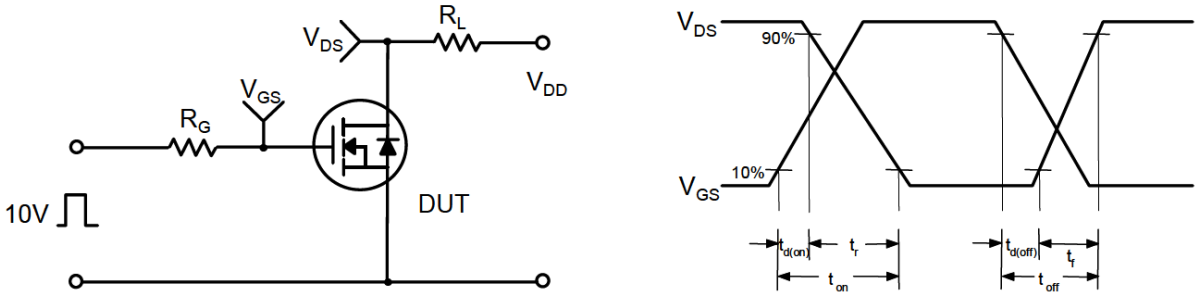


Typical Test Circuit

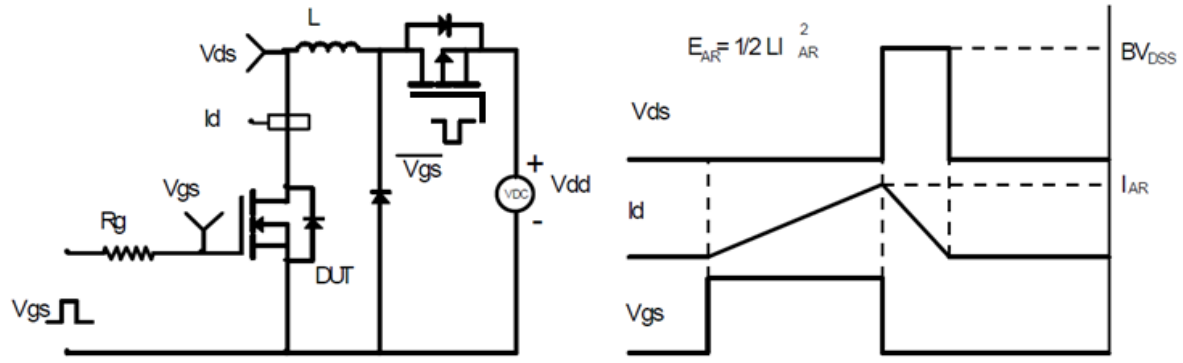
Gate Charge Test Circuit & Waveform



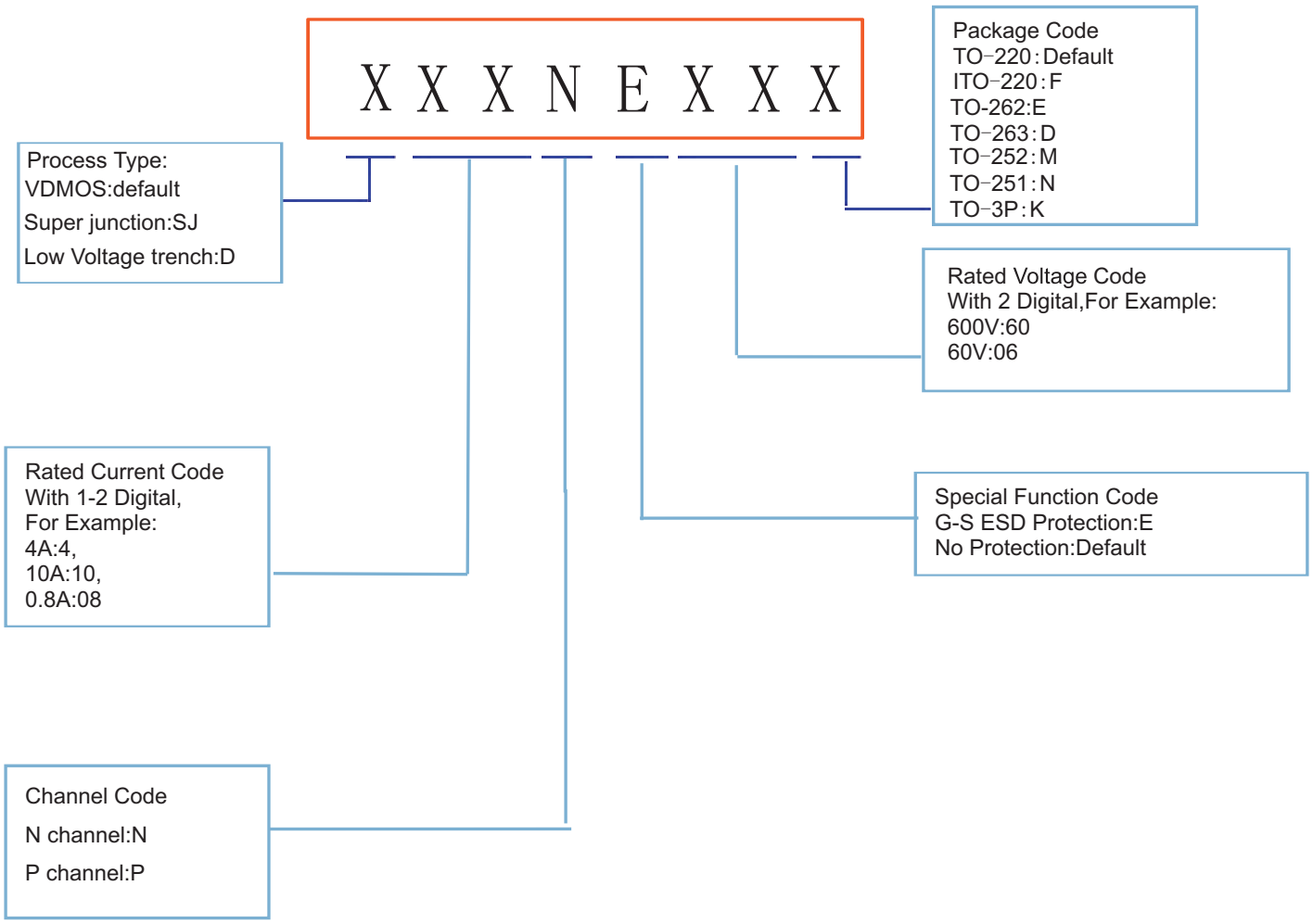
Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms

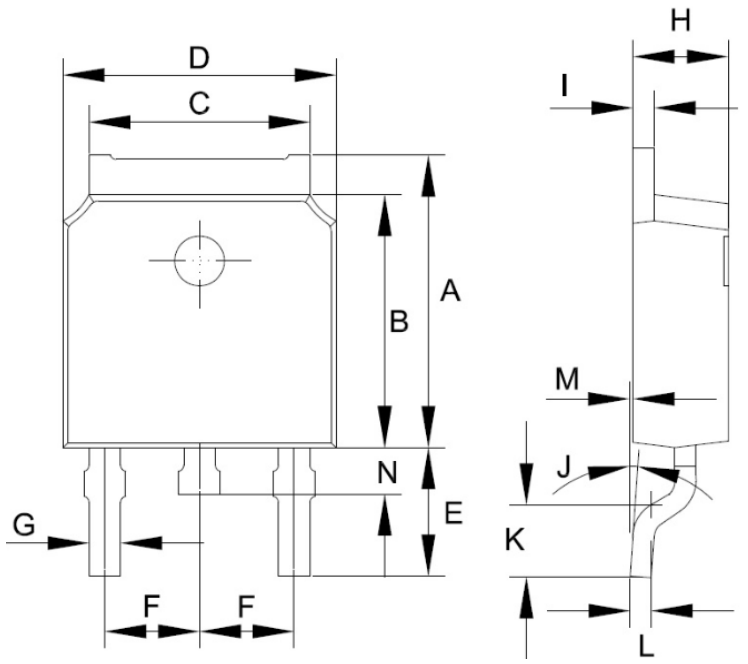


Product Names Rules



Dimensions

TO-252 Mechanical Drawing



TO-252(DPAK) Unit:mm		
DIM	MIN	MAX
A	6.85	7.25
B	5.90	6.30
C	5.13	5.53
D	6.40	6.80
E	2.90	3.30
F	2.19	2.39
G	0.45	0.85
H	2.20	2.40
I	0.41	0.61
J	0°	8°
K	1.45	1.85
L	0.41	0.61
M	0.00	0.12
N	0.60	1.00

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