



SWD80N06

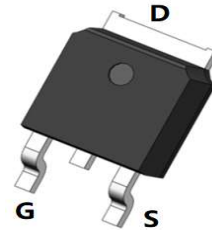
60V N -Channel MOSFET

Application

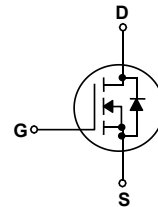
PWM Application
Load Switch
Power Management

Features

- N-Channel: 60V 80A
 $R_{DS(on)Typ} = 6.0\text{ m}\Omega @ V_{GS} = 10V$
- Very Low On-resistance $R_{DS(ON)}$
- Low C_{rss}
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability



TO-252



Package Marking

Part Number	Top Marking	Package	Packing Method	MOQ	QTY
SWD80N06	80N06	TO-252	Tape & Reel	2500	25000

Absolute Maximum Ratings

$T_C = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	SWD80N06	Units
V_{DSS}	Drain-Source Voltage	60	V
I_D	Drain Current - Continuous ($T_C = 25^\circ\text{C}$) - Continuous ($T_C = 100^\circ\text{C}$)	80	A
		50	A
I_{DM}	Drain Current - Pulsed (Note 1)	320	A
V_{GSS}	Gate-Source Voltage	± 20	V
E_{AS}	Single Pulsed Avalanche Energy (Note 2)	324	mJ
P_D	Power Dissipation ($T_C = 25^\circ\text{C}$)	108	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case	1.4	$^\circ\text{C/W}$
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150	$^\circ\text{C}$
T_L	Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	300	$^\circ\text{C}$

* Drain current limited by maximum junction temperature.



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Electrical Characteristics

T_C = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
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Off Characteristics

BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0 V, I _D = 250 μA	60	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 60 V, V _{GS} = 0 V	--	--	1	μA
		V _{DS} = 48V, T _C = 125°C	--	--	10	μA
I _{GSSF}	Gate-Body Leakage Current, Forward	V _{GS} = 20V, V _{DS} = 0 V	--	--	100	nA
I _{GSSR}	Gate-Body Leakage Current, Reverse	V _{GS} = -20 V, V _{DS} = 0 V	--	--	-100	nA

On Characteristics

V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250 μA	2.0	3.0	4.0	V
R _{DS(on)}	Static Drain-Source On-Resistance	V _{GS} = 10 V, I _D = 30A	--	6.5	7.5	mΩ

Dynamic Characteristics

C _{iss}	Input Capacitance	V _{DS} = 30 V, V _{GS} = 0 V, f = 1.0 MHz	--	6150	-	pF
C _{oss}	Output Capacitance		--	230	-	pF
C _{rss}	Reverse Transfer Capacitance		--	236	-	pF

Switching Characteristics

t _{d(on)}	Turn-On Delay Time	V _{GS} = 10V, V _{DS} = 30 V, R _G = 1.8 Ω, I _D = 40A (Note 3)	--	10	--	ns
t _r	Turn-On Rise Time		--	7	--	ns
t _{d(off)}	Turn-Off Delay Time		--	38	--	ns
t _f	Turn-Off Fall Time		--	16	--	ns
Q _g	Total Gate Charge	V _{DS} = 30 V, I _D = 40A, V _{GS} = 10V (Note 3)	--	118	--	nC
Q _{gs}	Gate-Source Charge		--	16	--	nC
Q _{gd}	Gate-Drain Charge		--	23	--	nC

Drain-Source Diode Characteristics and Maximum Ratings

I _S	Maximum Continuous Drain-Source Diode Forward Current	--	--	80	A
I _{SM}	Maximum Pulsed Drain-Source Diode Forward Current	--	--	320	A
V _{SD}	Drain to Source Diode Forward Voltage, V _{GS} = 0V, I _{SD} = 40A, T _J = 25°C	--	--	1.2	V

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: T_J = 25°C, V_{DD} = 30V, V_G = 10V, R_G = 25Ω, L = 0.5mH,
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 0.5%

N- Channel Typical Characteristics

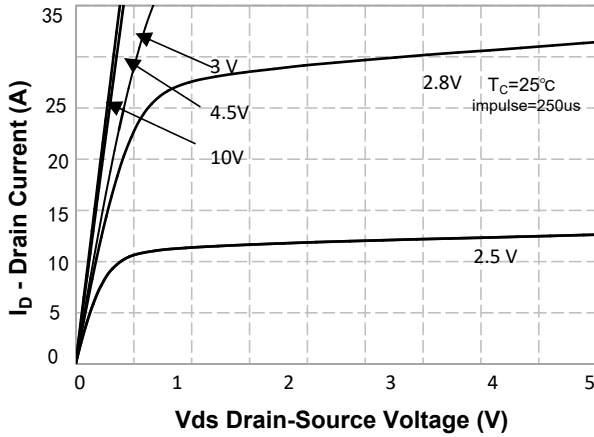


Figure 1. On-Region Characteristics

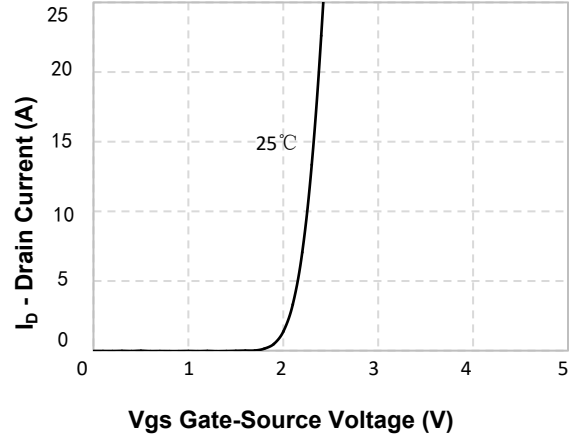


Figure 2. Transfer Characteristics

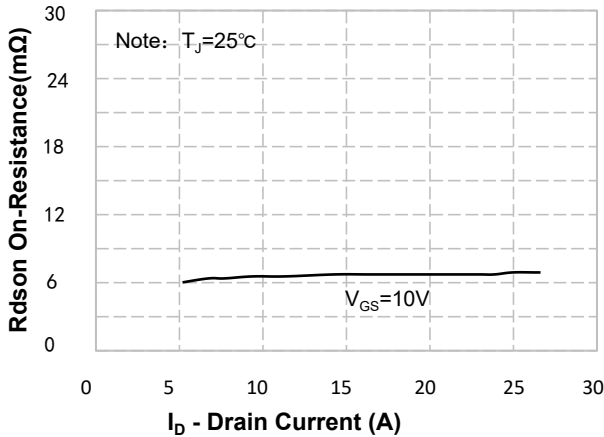


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

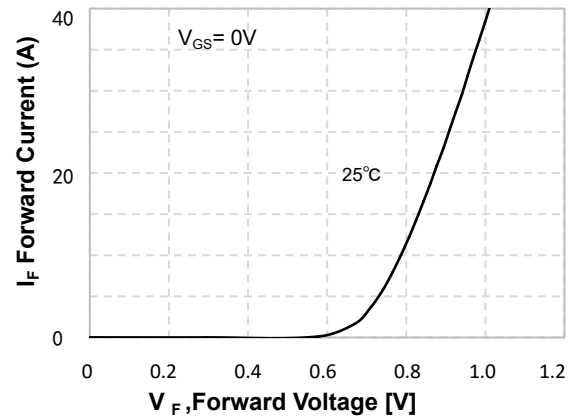


Figure 4. Body Diode Forward Voltage Variation vs Source Current

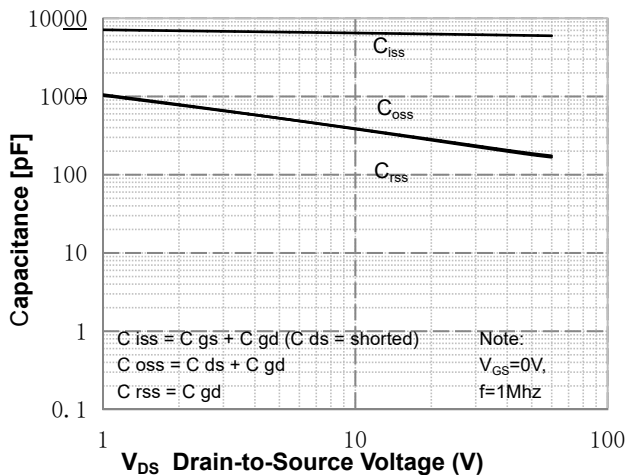


Figure 5. Capacitance Characteristics

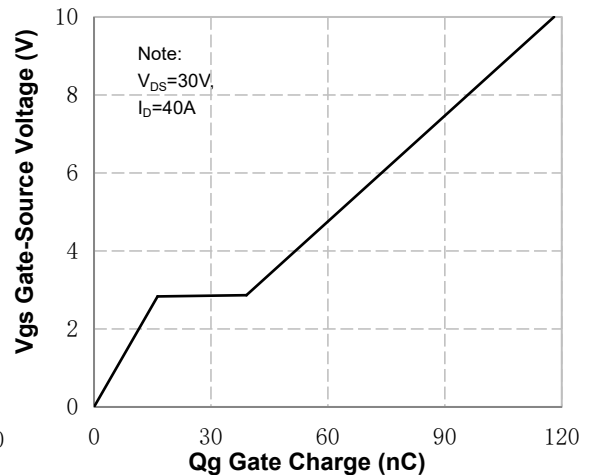


Figure 6. Gate Charge Characteristics

N- Channel Typical Characteristics (Continued)

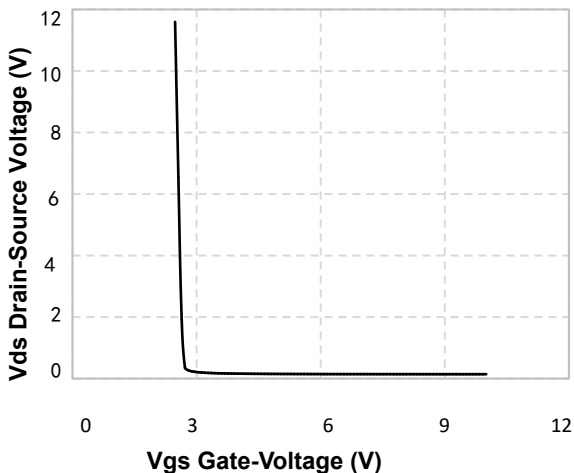


Figure 7. Vds Drain-Source Voltage vs Gate Voltage

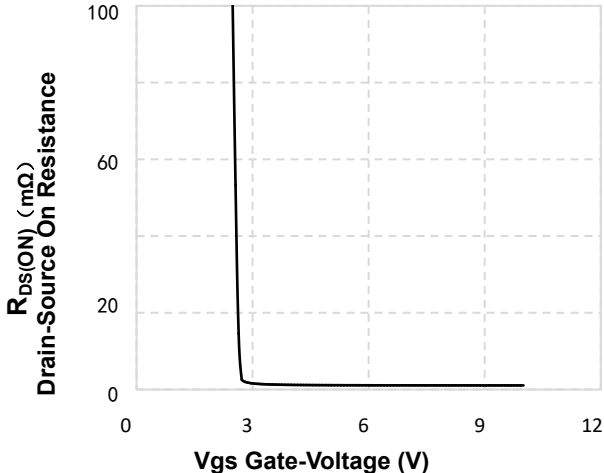


Figure 8. On-Resistance vs Gate Voltage

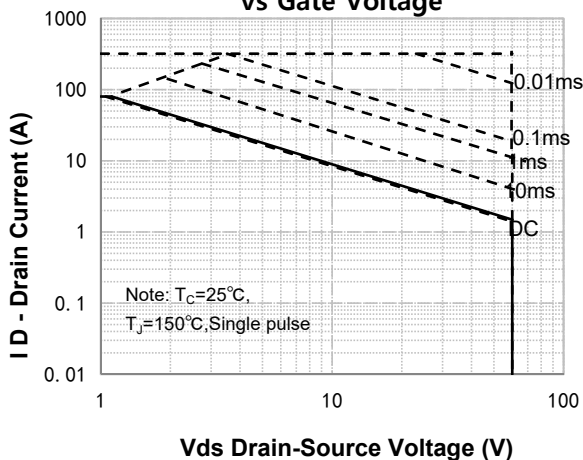


Figure 9. Maximum Safe Operating Area

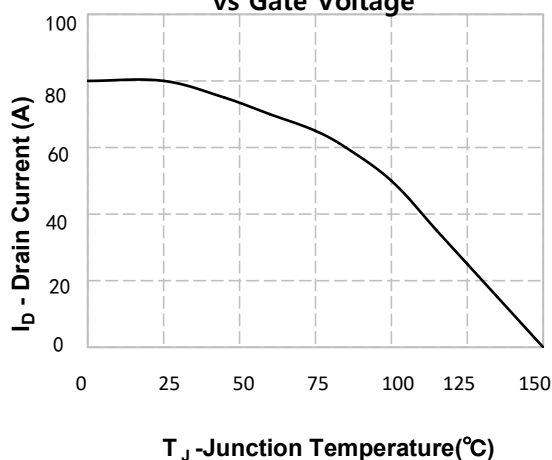


Figure 10. Maximum PContinuous Drain Current vs Temperature

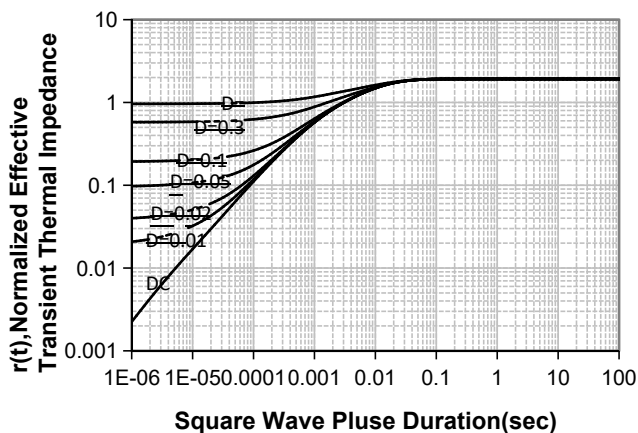
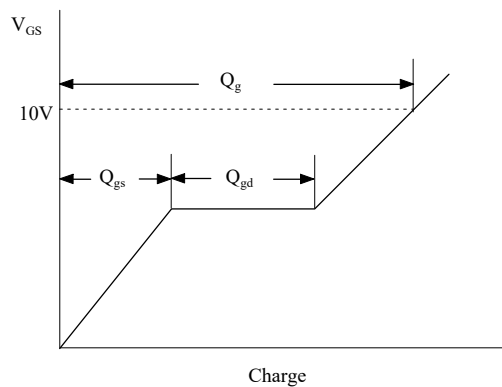
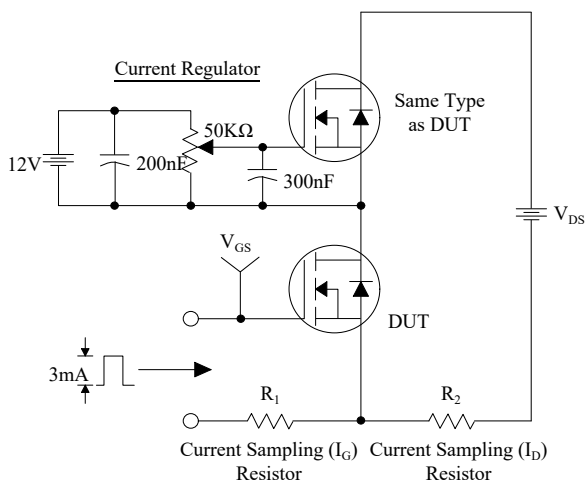
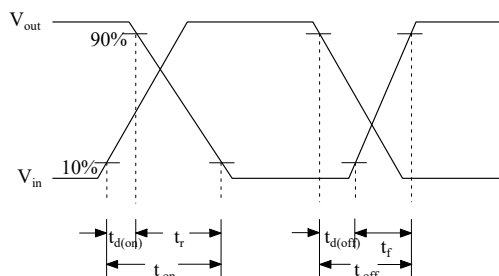
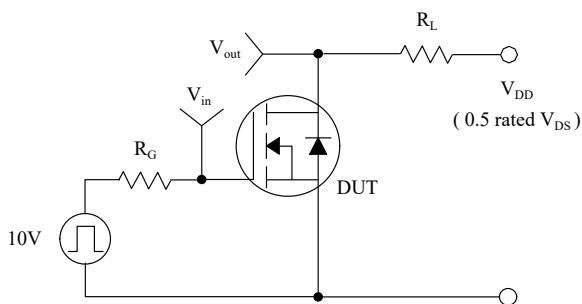


Figure 11. Transient Thermal Response Curve

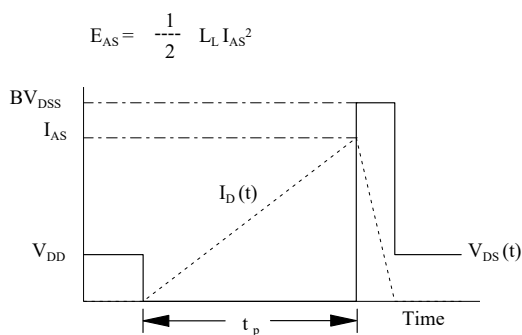
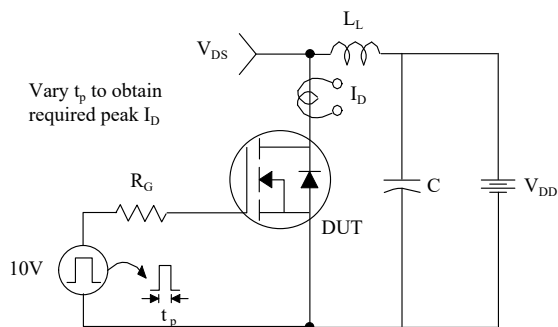
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms

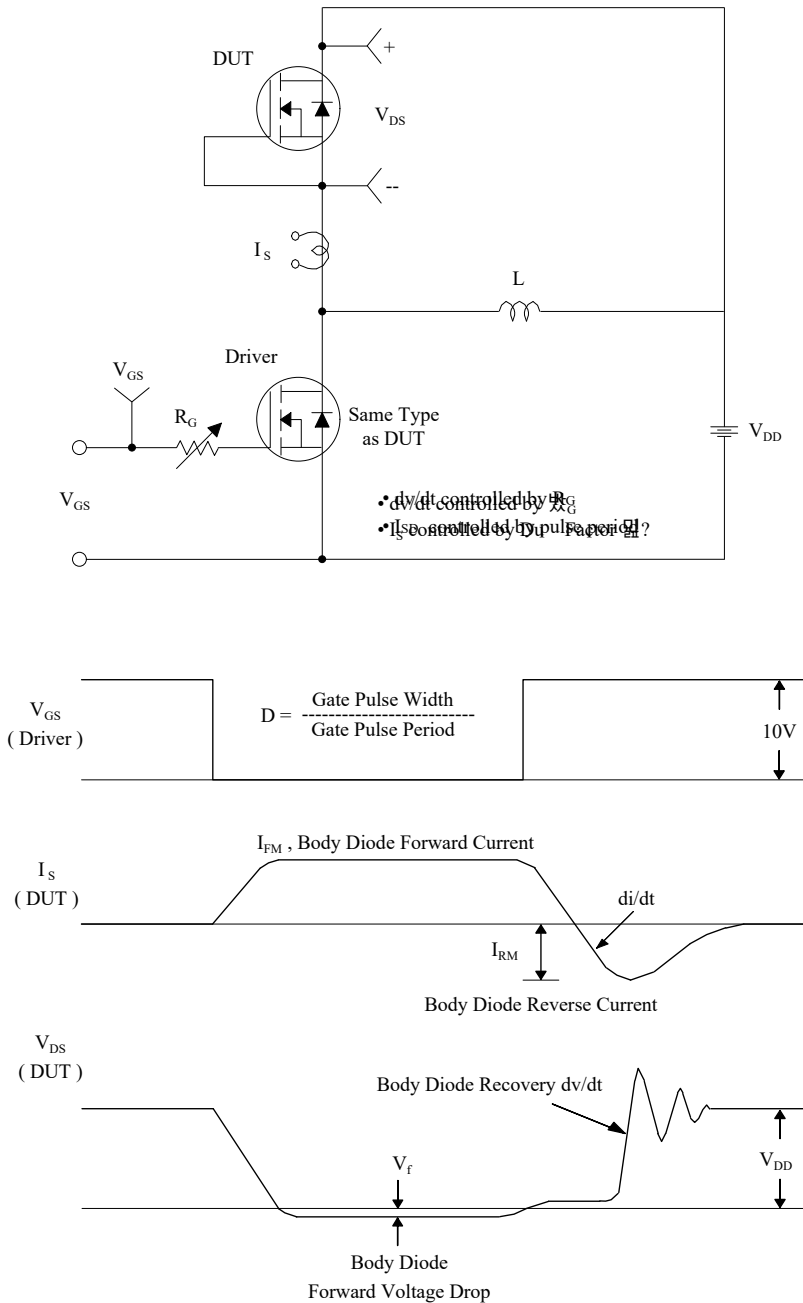




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Peak Diode Recovery dv/dt Test Circuit & Waveforms

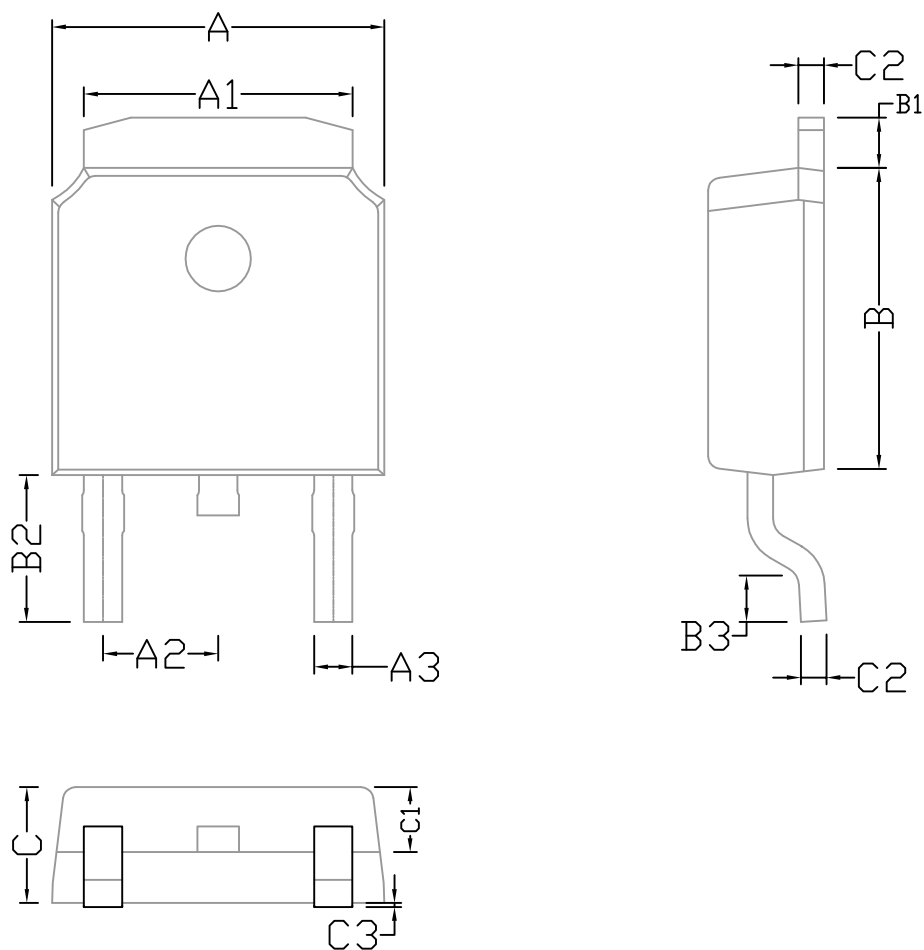




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Package Mechanical Data



标注	最小	标准	最大	标注	最小	标准	最大	标注	最小	标准	最大
A	6.50	6.60	6.70	B	6.05	6.10	6.15	C	2.25	2.30	2.35
A1	5.28	5.33	5.38	B1	0.95	1.00	1.05	C1	0.76	0.81	0.86
A2	2.23	2.28	2.33	B2	2.85	2.9	2.95	C2	0.45	0.50	0.55
A3	0.70	0.75	0.80	B3	1.45	1.50	1.55	C3	0.01	0.05	0.10