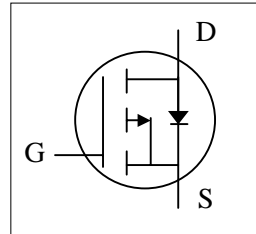




- ▼ Simple Drive Requirement
- ▼ 2.5V Gate Drive Capability
- ▼ Fast Switching Characteristic
- ▼ RoHS Compliant & Halogen-Free

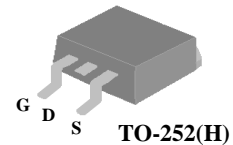


BV_{DSS}	-20V
$R_{DS(ON)}$	150m Ω
I_D	-10A

Description

AP3310 series are from Advanced Power innovated design and silicon process technology to achieve the lowest possible on-resistance and fast switching performance. It provides the designer with an extreme efficient device for use in a wide range of power applications.

The TO-252 package is widely preferred for all commercial-industrial surface mount applications using infrared reflow technique and suited for high current application due to the low connection resistance.



Absolute Maximum Ratings @ $T_j=25^\circ\text{C}$ (unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	- 20	V
V_{GS}	Gate-Source Voltage	+12	V
$I_D@T_c=25^\circ\text{C}$	Drain Current, V_{GS} @ 4.5V	-10	A
$I_D@T_c=100^\circ\text{C}$	Drain Current, V_{GS} @ 4.5V	-6.2	A
I_{DM}	Pulsed Drain Current ¹	-24	A
$P_D@T_c=25^\circ\text{C}$	Total Power Dissipation	25	W
	Linear Derating Factor	0.01	W/ $^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_j	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

Thermal Data

Symbol	Parameter	Value	Units
Rthj-c	Maximum Thermal Resistance, Junction-case	5.0	$^\circ\text{C}/\text{W}$
Rthj-a	Maximum Thermal Resistance, Junction-ambient (PCB mount) ³	62.5	$^\circ\text{C}/\text{W}$



Electrical Characteristics @T_j=25°C(unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250uA	-20	-	-	V
ΔBV _{DSS} /ΔT _j	Breakdown Voltage Temperature Coefficient	Reference to 25°C, I _D =-1mA	-	-0.1	-	V/°C
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =-4.5V, I _D =-2.8A	-	-	150	mΩ
		V _{GS} =-2.5V, I _D =-2.0A	-	-	250	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250uA	-0.5	-	-	V
g _{fs}	Forward Transconductance	V _{DS} =-5V, I _D =-2.8A	-	4.4	-	S
I _{DSS}	Drain-Source Leakage Current	V _{DS} =-20V, V _{GS} =0V	-	-	-1	uA
	Drain-Source Leakage Current (T _j =125°C)	V _{DS} =-16V, V _{GS} =0V	-	-	-250	uA
I _{GSS}	Gate-Source Leakage	V _{GS} =±12V, V _{DS} =0V	-	-	±100	nA
Q _g	Total Gate Charge	I _D =-2.8A	-	6	-	nC
Q _{gs}	Gate-Source Charge	V _{DS} =-6V	-	1.5	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge	V _{GS} =-5V	-	0.6	-	nC
t _{d(on)}	Turn-on Delay Time	V _{DS} =-6V	-	25	-	ns
t _r	Rise Time	I _D =-1A	-	60	-	ns
t _{d(off)}	Turn-off Delay Time	R _G =6Ω, V _{GS} =-5V	-	70	-	ns
t _f	Fall Time	R _D =6Ω	-	60	-	ns
C _{iss}	Input Capacitance	V _{GS} =0V	-	300	-	pF
C _{oss}	Output Capacitance	V _{DS} =-6V	-	180	-	pF
C _{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	60	-	pF

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
I _S	Continuous Source Current (Body Diode)	V _D =V _G =0V , V _S =-1.2V	-	-	-10	A
I _{SM}	Pulsed Source Current (Body Diode) ¹		-	-	-24	A
V _{SD}	Forward On Voltage ²	T _j =25°C, I _S =-10A, V _{GS} =0V	-	-	-1.2	V

Notes:

- 1.Pulse width limited by Max. junction temperature.
- 2.Pulse test
- 3.Surface mounted on 1 in² copper pad of FR4 board

THIS PRODUCT IS SENSITIVE TO ELECTROSTATIC DISCHARGE, PLEASE HANDLE WITH CAUTION.

USE OF THIS PRODUCT AS A CRITICAL COMPONENT IN LIFE SUPPORT OR OTHER SIMILAR SYSTEMS IS NOT AUTHORIZED.

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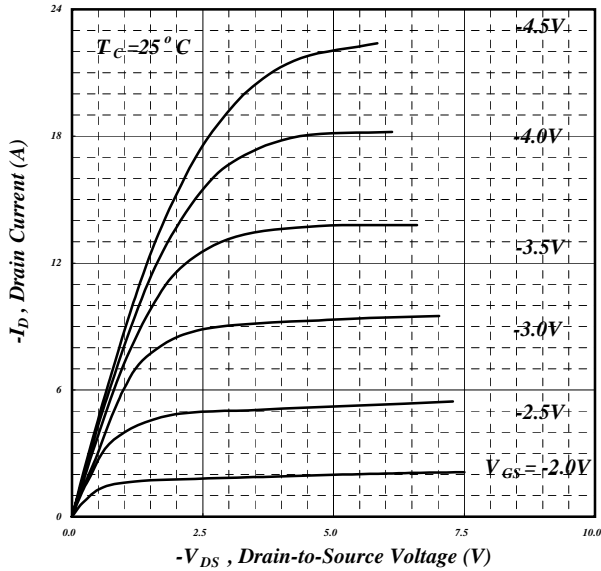


Fig 1. Typical Output Characteristics

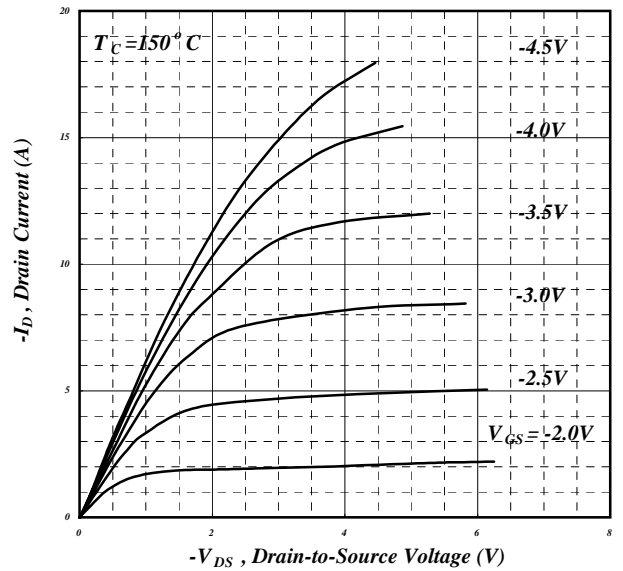


Fig 2. Typical Output Characteristics

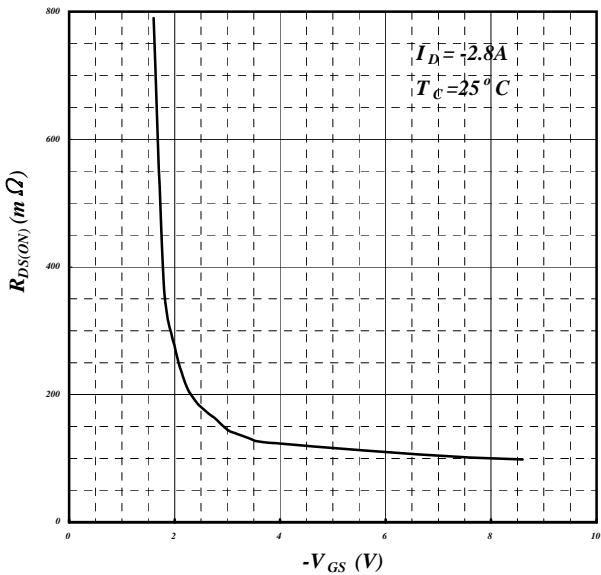


Fig 3. On-Resistance v.s. Gate Voltage

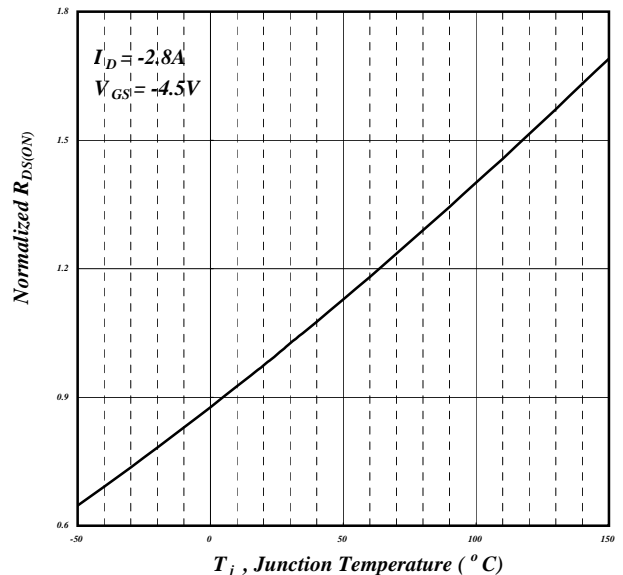


Fig 4. Normalized On-Resistance v.s. Junction Temperature

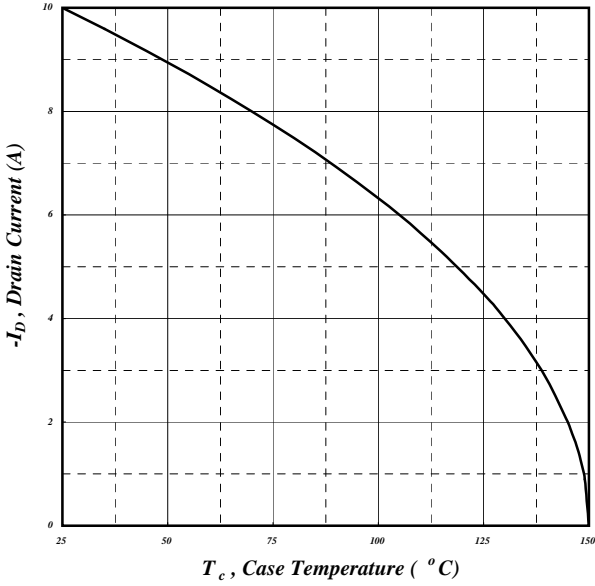


Fig 5. Drain Current v.s. Case Temperature

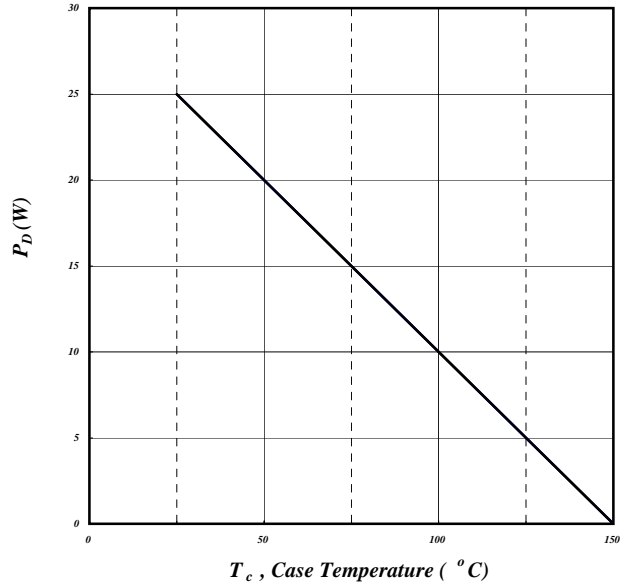


Fig 6. Typical Power Dissipation

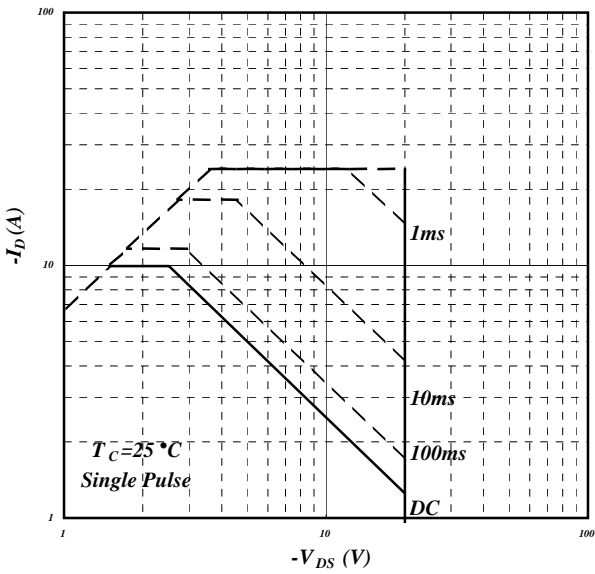


Fig 7. Maximum Safe Operating Area

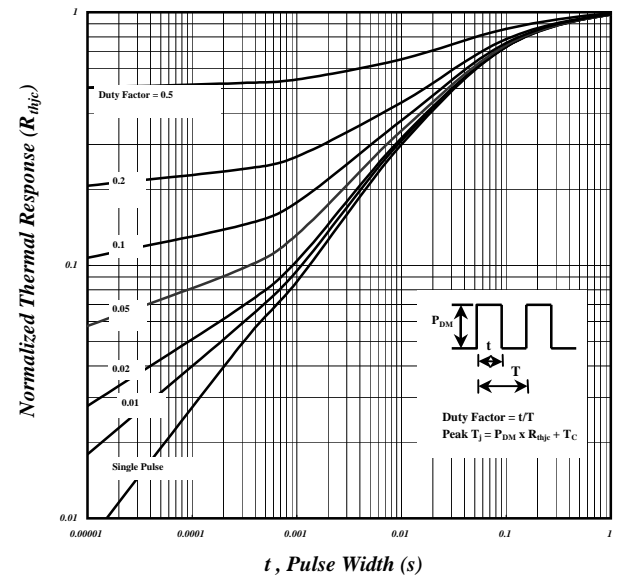


Fig 8. Effective Transient Thermal Impedance

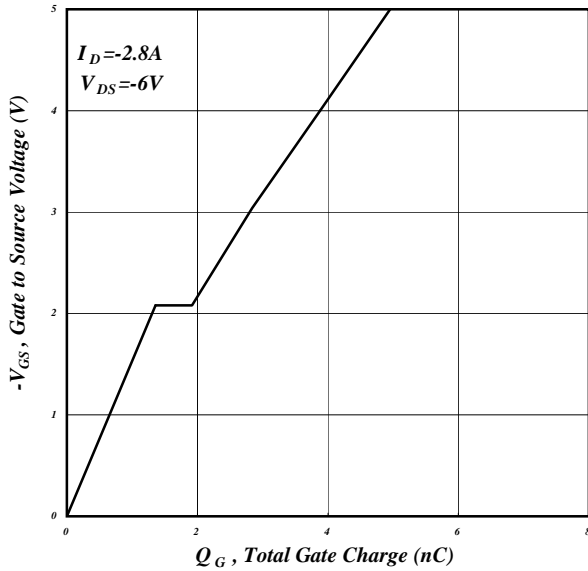


Fig 9. Gate Charge Characteristics

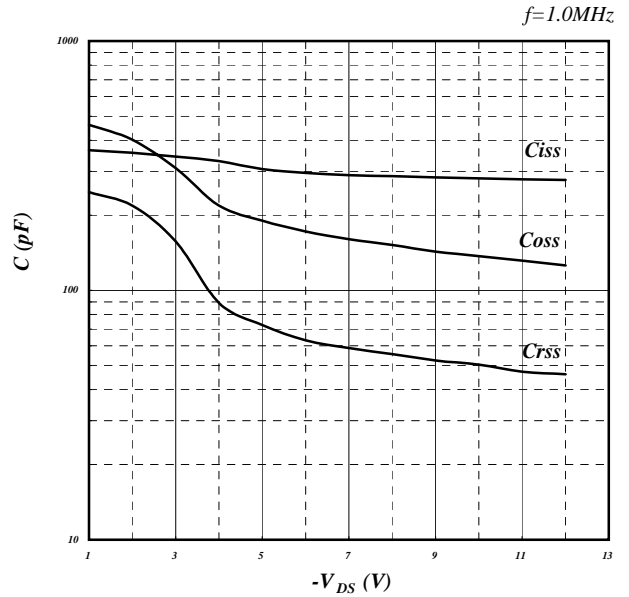


Fig 10. Typical Capacitance Characteristics

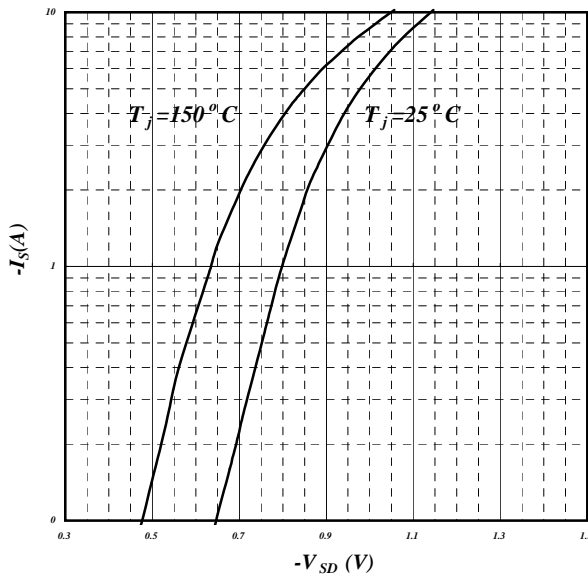


Fig 11. Forward Characteristic of Reverse Diode

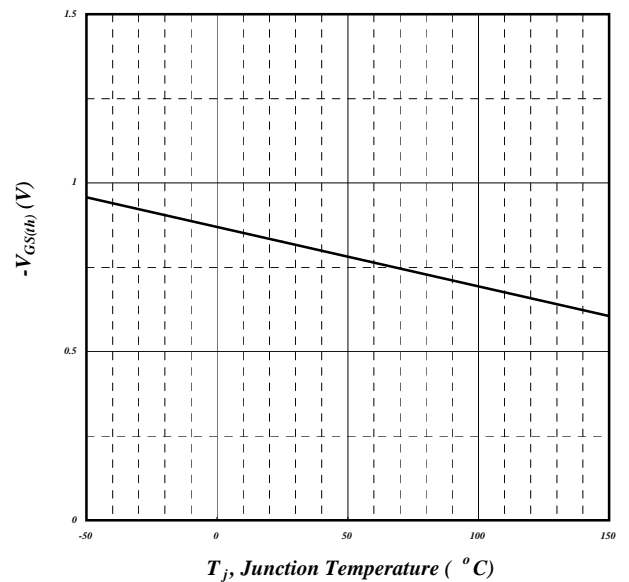


Fig 12. Gate Threshold Voltage v.s. Junction Temperature

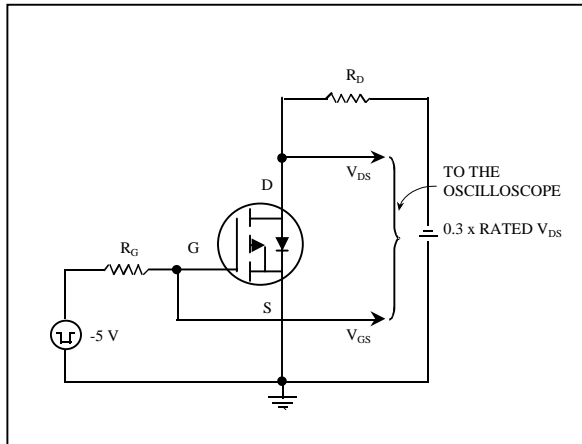


Fig 13. Switching Time Circuit

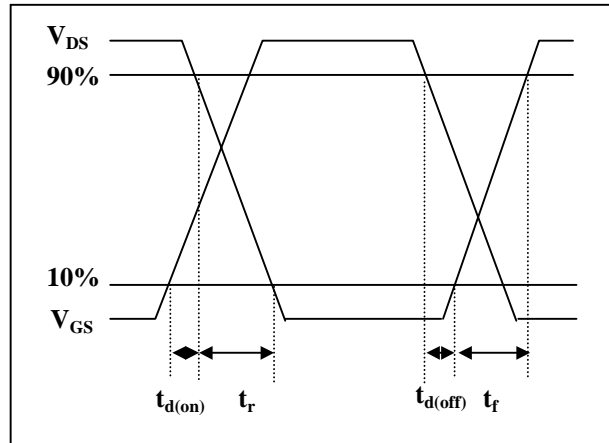


Fig 14. Switching Time Waveform

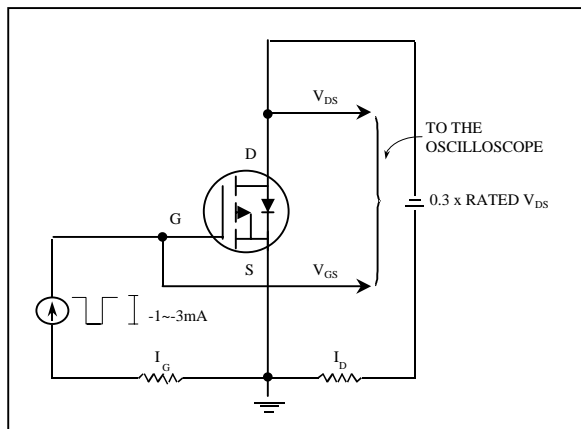


Fig 15. Gate Charge Circuit

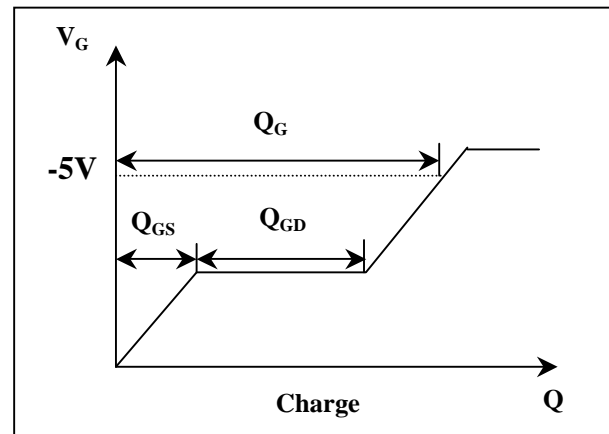
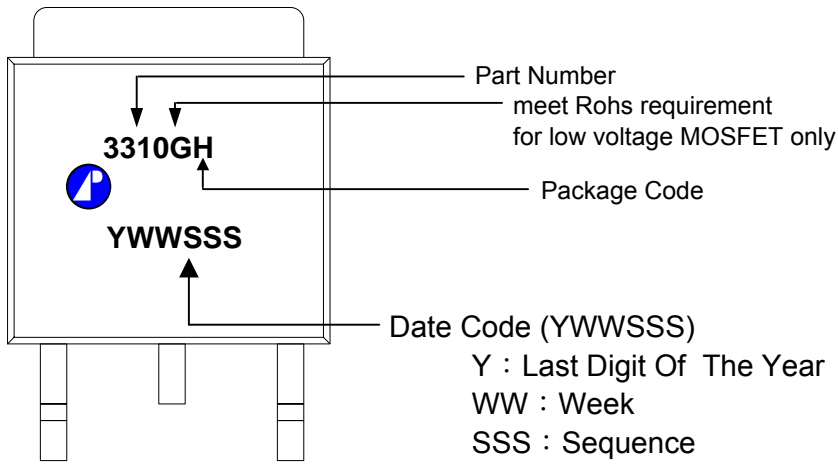


Fig 16. Gate Charge Waveform

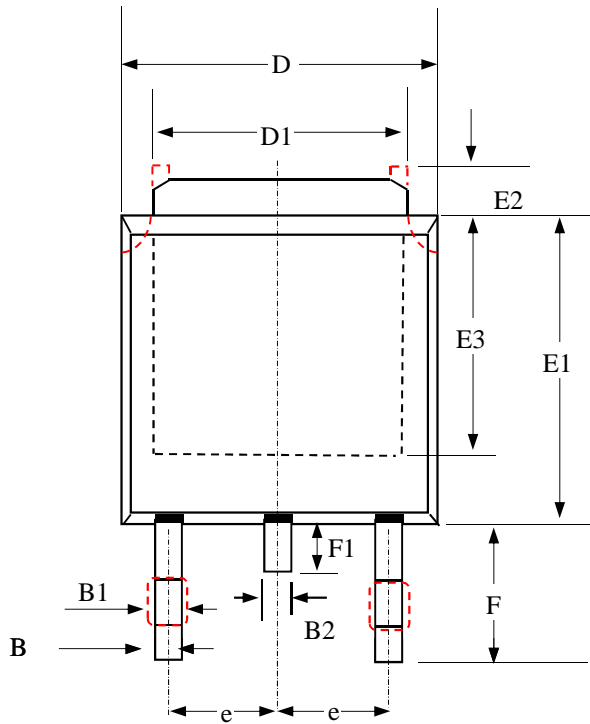


MARKING INFORMATION

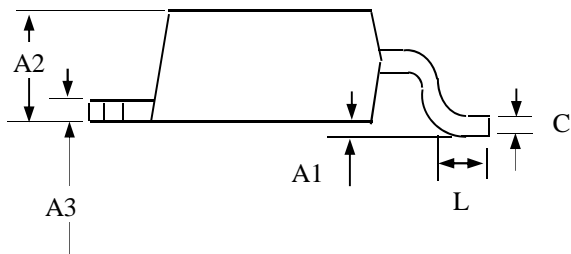




Package Outline : TO-252



SYMBOLS	Millimeters		
	MIN	NOM	MAX
A2	2.10	2.30	2.50
A3	0.40	0.50	0.65
B	0.40	0.70	1.00
B1	0.50	0.85	1.20
D	6.00	6.50	6.80
D1	4.80	5.35	5.90
E3	4.00 (ref.)		
F	2.00	2.63	3.05
F1	0.50	0.85	1.20
E1	5.00	5.70	6.30
E2	0.50	1.10	1.80
e	2.3 (ref)		
C	0.35	0.525	0.70
A1	0.00	—	0.25
B2	—	—	1.25
L	0.90	1.34	1.78



- 1.All Dimensions Are in Millimeters.
- 2.Dimension Does Not Include Mold Protrusions.
3. Thermal PAD, Body and Pin contour is for reference, it may has little difference by option.



TO-252 FOOTPRINT :

