



General Description

The UV6S100R uses advanced Trench technology and design to provide excellent $R_{DS(on)}$ with low gate charge.

This device is suitable for use in PWM, load switching and general purpose applications.

Features

N-Channel, 5V Logic Level Control

Enhancement Mode

Very low on-resistance $R_{DS(on)}$ @ $V_{GS}=10V$

100% Avalanche Tested

Pb-free lead plating; ROHS compliant

VDS	55	V
$R_{DS(on)}$ TYP @ $V_{GS}=10V$	5.7	m Ω
I_D	110	A

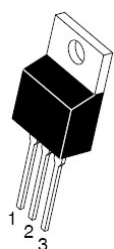
Applications

Power switching application

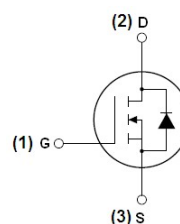
Hard Switched and High Frequency Circuits

Uninterruptible Power Supply

Isolated DC/DC Converters in Telecom and Industrial



TO-220AB-3L Top view



Schematic diagram

Package Marking And Ordering Information

Part ID	Package Type	Marking	Tape and Reel information
UV6S100R	TO-220AB	UV6S100R	50pcs/Tube

Maximum ratings, at $T_J=25^\circ\text{C}$, unless otherwise specified

Symbol	Parameter	Rating	Unit
$V_{(BR)DSS}$	Drain –Source breakdown voltage	55	V
I_S	Diode continuous forward current	$T_c=25^\circ\text{C}$ 110	A
I_D	Continuous drain current @ $V_{GS}=10V$	$T_c=25^\circ\text{C}$ 110 $T_c=100^\circ\text{C}$ 80	A
I_{DM}	Pulse drain current tested①	$T_c=25^\circ\text{C}$ 300	A
E_{AS}	Avalanche energy, single pulsed②	900	mJ
P_D	Maximum power dissipation	$T_c=25^\circ\text{C}$ 190	W
V_{GS}	Gate-Source voltage	± 25	V
$T_{STG} T_J$	Storage and operating temperature range	-55 to 175	$^\circ\text{C}$



Thermal Characteristic

Symbol	Parameter	Typical	Unit
R_{QJC}	Thermal Resistance-Junction to Case	1.3	$^{\circ}\text{C}/\text{W}$
R_{QJA}	Thermal Resistance-Junction to Ambient	62.5	$^{\circ}\text{C}/\text{W}$

Typical Characteristics

Symbol	Parameter	Condition	Min	Type	Max	Unit
Static Electrical Characteristics @T _j =25 $^{\circ}\text{C}$ (unless otherwise stated)						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0\text{V}, I_D=250\mu\text{A}$	55			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=44\text{V}, V_{GS}=0\text{V}$			1	μA
	Zero Gate Voltage Drain Current(T _j =125 $^{\circ}\text{C}$)	$V_{DS}=44\text{V}, V_{GS}=0\text{V}$			100	μA
I_{GSS}	Gate-Body Leakage Current	$V_{GS}=\pm 25\text{V}, V_{DS}=0\text{V}$			± 100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	2		4	V
$R_{DS(ON)}$	Drain-Source On-State Resistance③	$V_{GS}=10\text{V}, I_D=40\text{A}$		5.7	6.4	m Ω
Dynamic Electrical Characteristics @T _j =25 $^{\circ}\text{C}$ (unless otherwise stated)						
C_{iss}	Input Capacitance	$V_{DS}=44\text{V},$		3000		PF
C_{oss}	Output Capacitance	$V_{GS}=0\text{V},$		430		PF
C_{rss}	Reverse Transfer Capacitance	$F=1\text{MHz}$		240		PF
R_g	Gate Resistance	$F=1\text{MHz}$		2		Ω
Q_g	Total Gate Charge	$V_{DS}=44\text{V},$		106		nC
Q_{gs}	Gate-Source Charge	$I_D=40\text{A},$		20		nC
Q_{gd}	Gate-Drain Charge	$V_{GS}=10\text{V}$		35		nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay time	$V_{DD}=44\text{V}$		34		nS
t_r	Turn-on Rise time	$I_D=1\text{A}$		30		nS
$t_{d(off)}$	Turn-off Delay time	$R_G=2\Omega$		124		nS
t_f	Turn-off Fall time	$V_{GS}=10\text{V}$		64		nS
Source-Drain Diode Characteristics						
V_{SD}	Forward on voltage	$I_{SD}=10\text{A}, V_{GS}=0\text{V}$		0.8	1.3	V
t_{rr}	Reverse Recovery Time	$T_j=25^{\circ}\text{C}, I_{SD}=40\text{A}$		74		nS
Q_{rr}	Reverse Recovery Charge	$V_{GS}=0\text{V}, di/dt=500\text{A}/\mu\text{s}$		140		nC

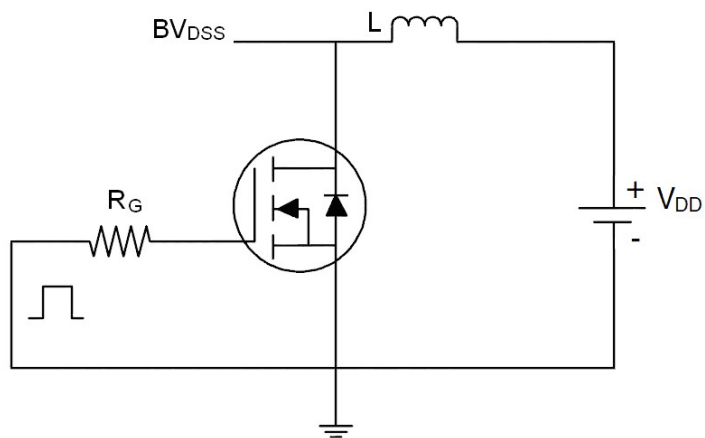
Note:

- ① Repetitive rating; pulse width limited by max, junction temperature.
- ② Limited by T_jmax, starting T_j=25 $^{\circ}\text{C}$, L=0.5mH, R_G=25 Ω , I_{AS}=20A, V_{GS}=10V, Part not recommended for use above this value
- ③ Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$

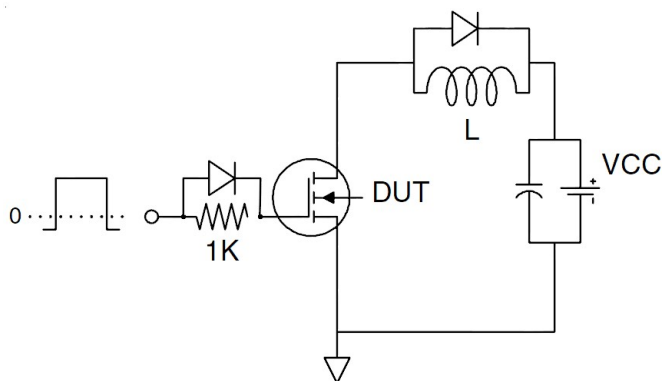


Test circuit

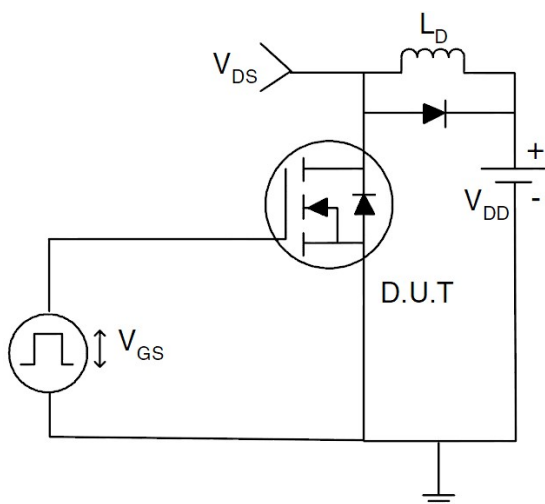
(1) E_{AS} test circuits



(2) Gate charge test circuit

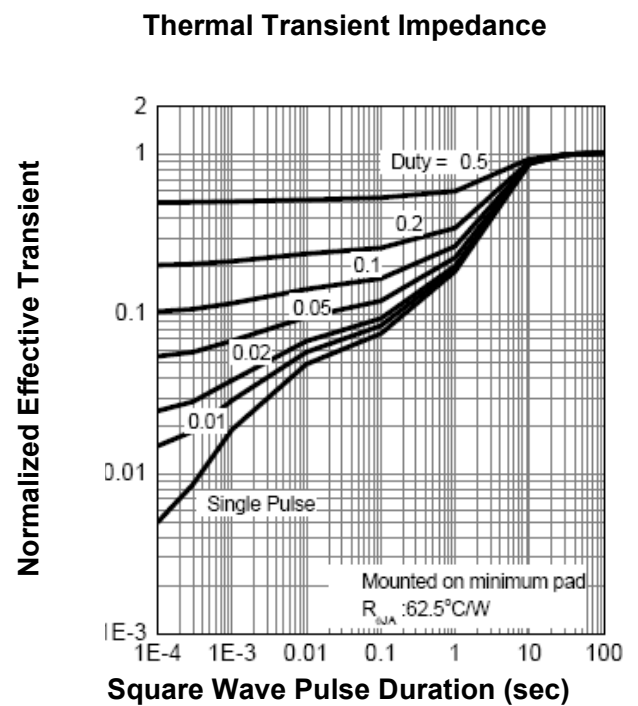
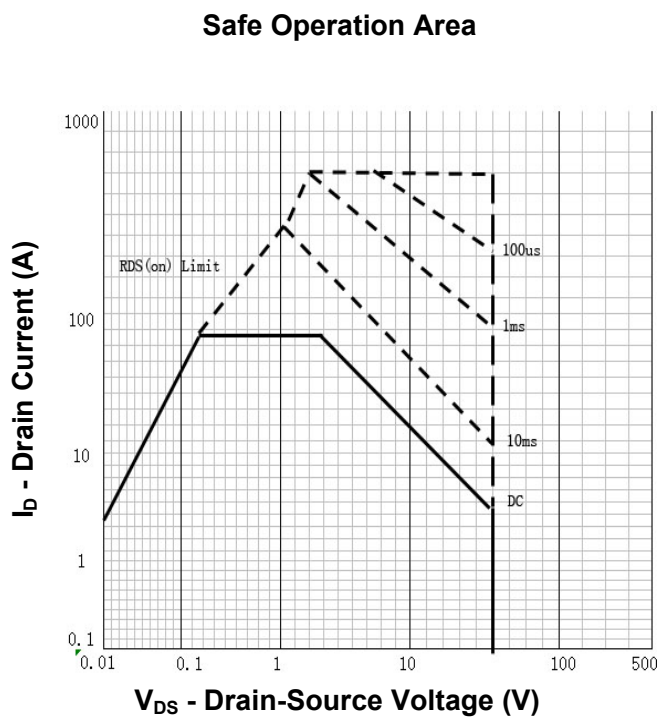
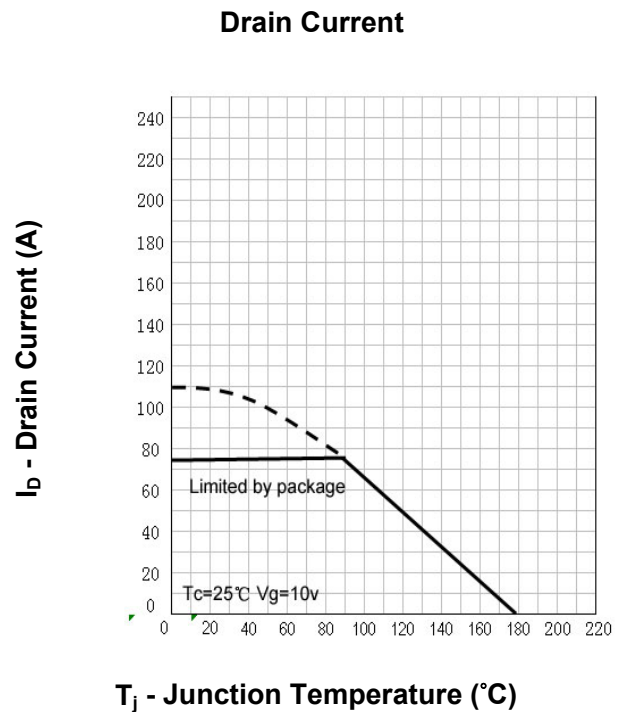
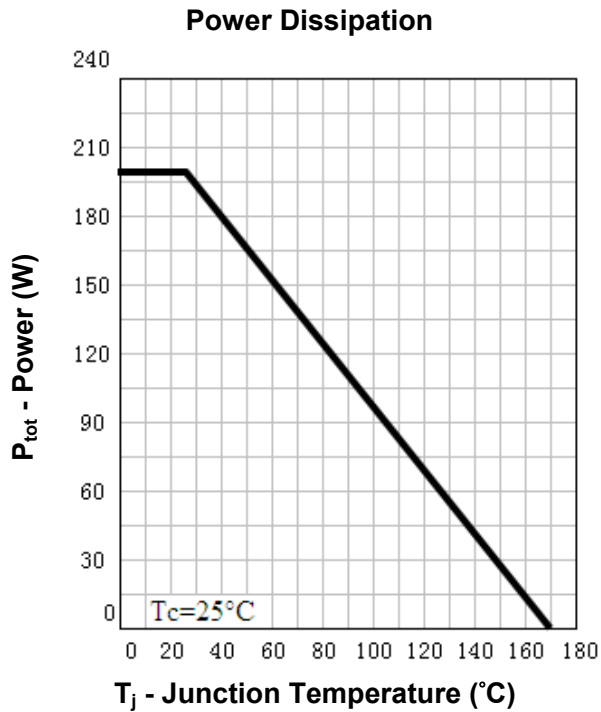


(3) Switch time test circuit



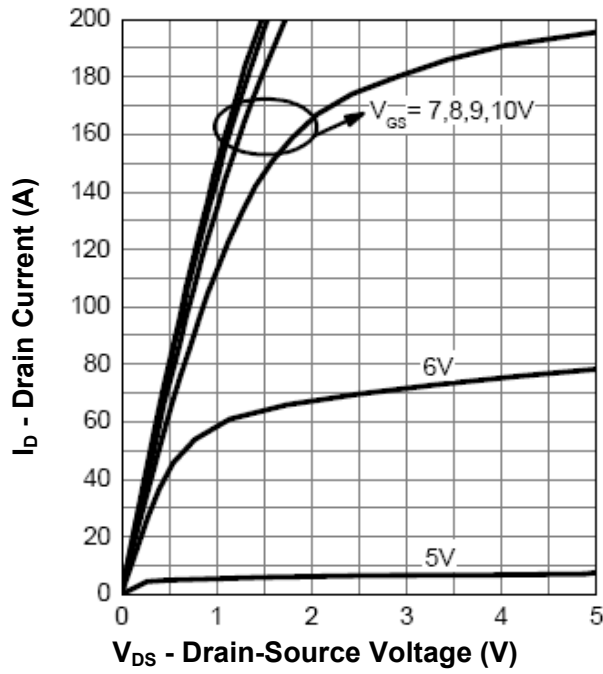


Typical Characteristics

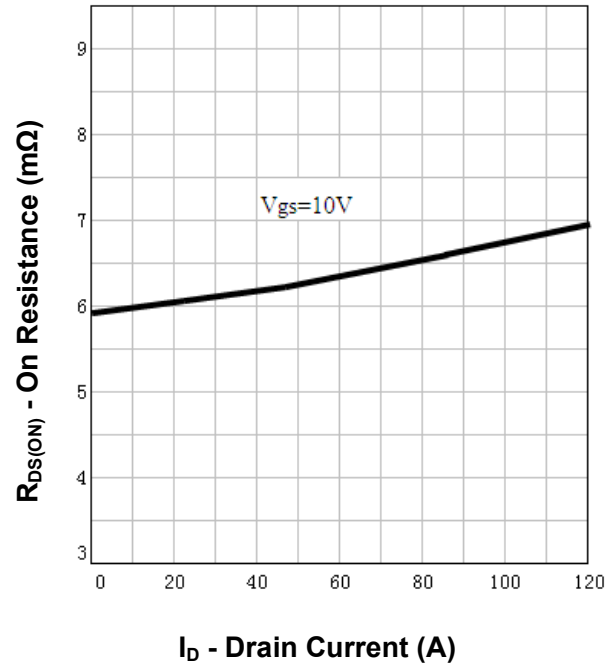




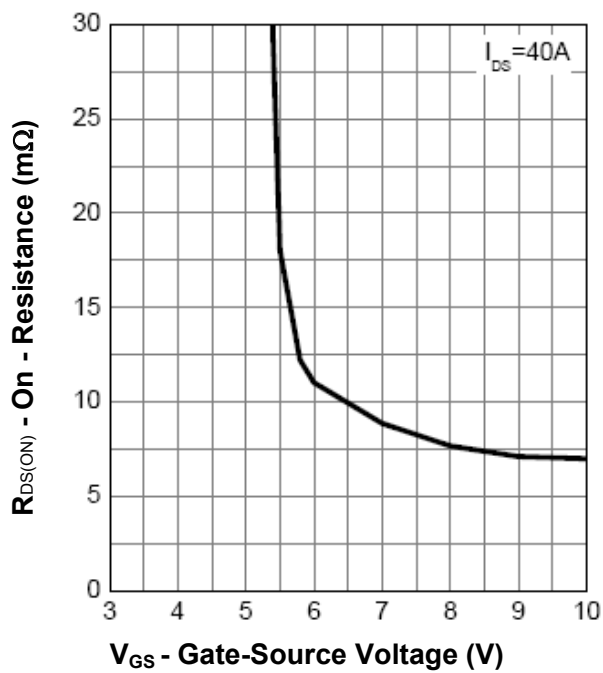
Output Characteristics



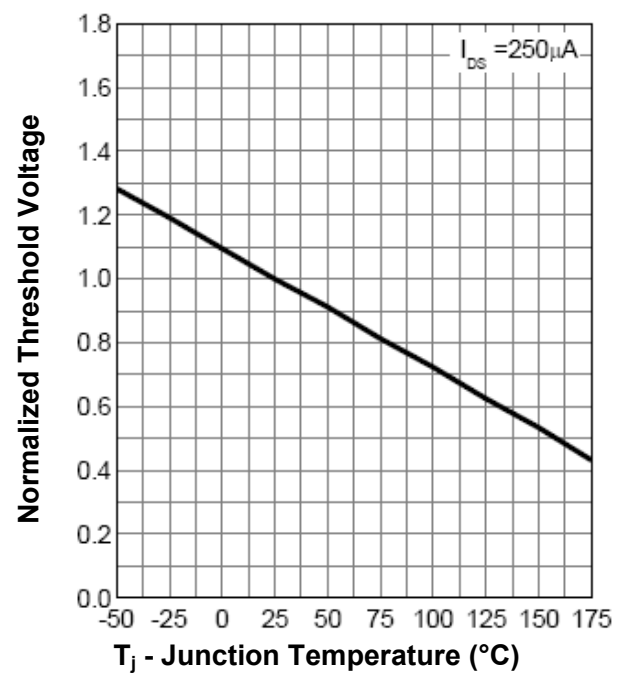
Drain-Source On Resistance



Drain-Source On Resistance



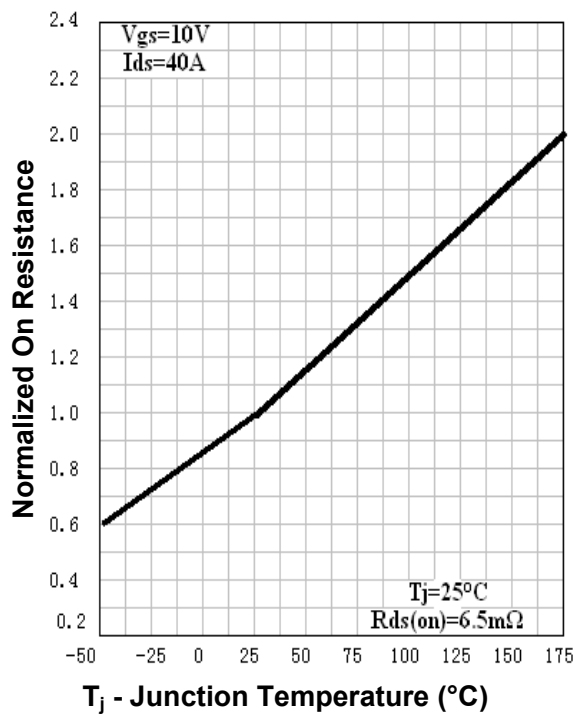
Gate Threshold Voltage



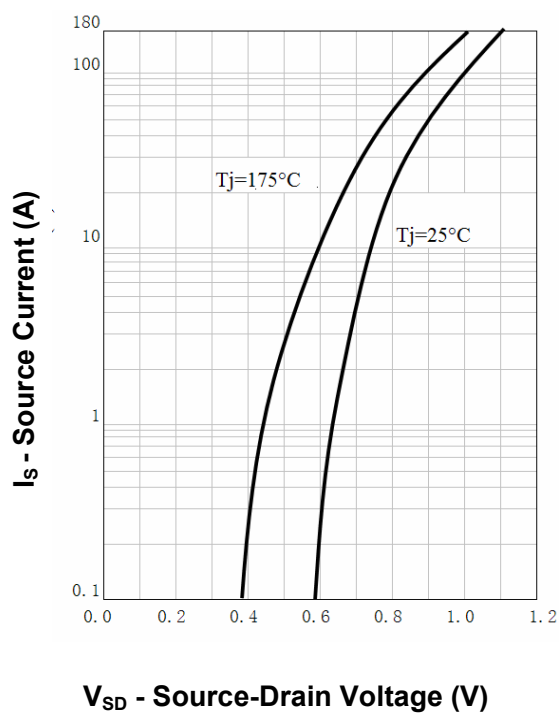


Typical Characteristics

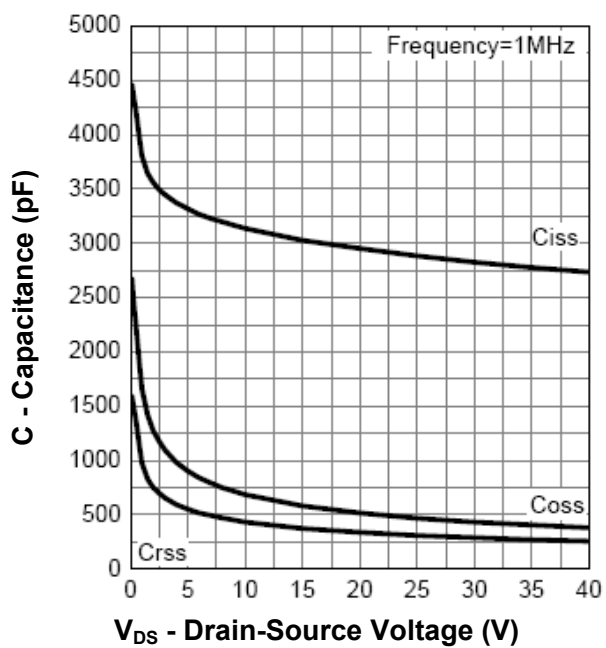
Drain-Source On Resistance



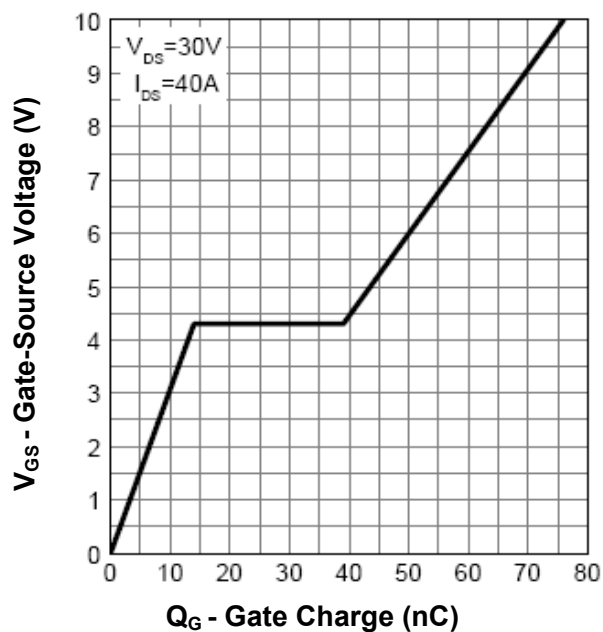
Source-Drain Diode Forward



Capacitance

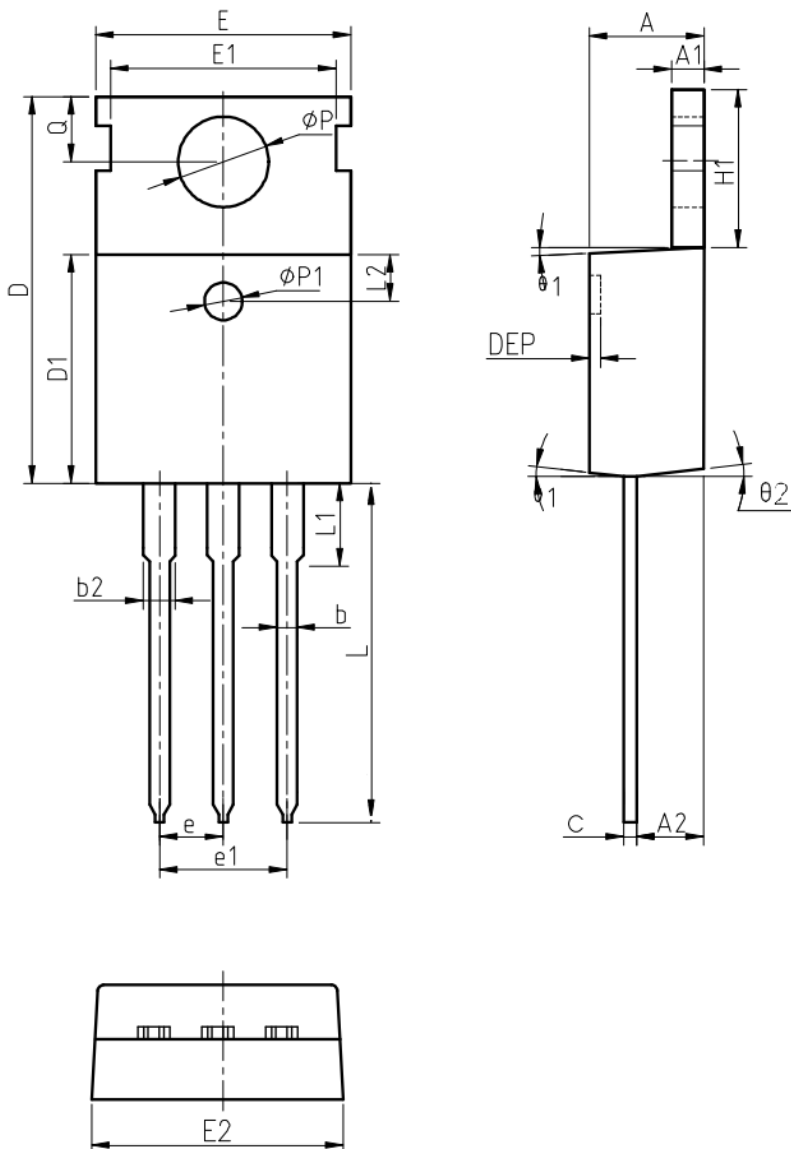


Gate Charge





TO-220AB Package Outline Data



Symbol	Dimensions (unit: mm)		
	Min	Typ	Max
A	4.30	4.52	4.70
A1	1.15	1.30	1.40
A2	2.20	2.40	2.60
b	0.70	0.80	1.00
b2	1.17	1.32	1.50
c	0.45	0.50	0.61
D	15.30	15.65	15.90
D1	9.00	9.20	9.40
DEP	0.05	0.10	0.25
E	9.66	9.90	10.28
E1	-	8.70	-
E2	9.80	10.00	10.20
ΦP1	1.40	1.50	1.60
e	2.54 BSC		
e1	5.08 BSC		
H1	6.40	6.50	6.80
L	12.70	-	14.27
L1	-	-	3.95
L2	2.40	2.50	2.60
ΦP	3.53	3.60	3.70
Q	2.70	2.80	2.90
θ1	5 °	7 °	9 °
θ2	1 °	3 °	5 °

Notes:

1. Refer to JEDEC TO-220 variation AB
2. Dimension "D" and "E" do NOT include mold flash. Mold flash shall not exceed 0.127mm per side.