P-Ch 100V Fast Switching MOSFETs

Features

- Split Gate Trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low RDS(ON)

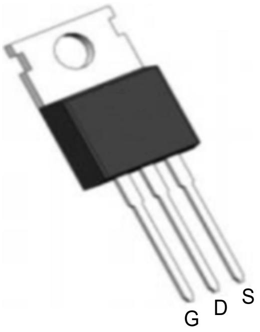
Product Summary

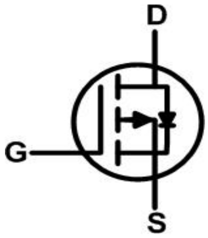
BVDSS	RDSON	ID
-100V	22 mΩ	-80 A

Applications

- DC-DC Converters
- Power managemen t functions
- Synchronous-rectification applications

TO220AB Pin Configuration





Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-100	V
V_{GS}	Gate-Source Voltage	±20	V
$I_D@T_C=25^\circ C$	Continuous Drain Current, V_{GS} @ 10V[1,6]	-80	A
$I_D@T_C=100^\circ C$	Continuous Drain Current, V_{GS} @ 10V[1,6]	-41	A
I_{DM}	Pulsed Drain Current[2]	-260	A
EAS	Single Pulse Avalanche Energy[3]	---	mJ
I_{AS}	Avalanche Current	---	A
$P_D@T_C=25^\circ C$	Total Power Dissipation[4]	250	W
T_{STG}	Storage Temperature Range	-55 to 150	˚C
T_J	Operating Junction Temperature Range	-55 to 150	˚C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [1]	---	62	˚C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	0.5	˚C/W

Electrical Characteristics (T_J=25 ˚C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V., I_D=-250uA	-100	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BV_{DSS} Temperature Coefficient	Reference to 25˚C , I_D=-1mA	---	---	---	V/˚C
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=-10V , I_D=-15A	---	22	25	mΩ
		V_{GS}=-4.5V , I_D=-3A	---	---	---	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	-2	-3	-4	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	---	---	mV/˚C
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-100V , V_{GS}=0V , T_J=25˚C	---	---	1	uA
		V_{DS}=-100V, V_{GS}=0V , T_J=100˚C	---	---	---	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
Q_g	Total Gate Charge	V_{DS}=-30V , V_{GS}=-10V , I_D=-3A	---	76	---	nC
Q_{gs}	Gate-Source Charge		---	13	---	
Q_{gd}	Gate-Drain Charge		---	12.4	---	
$T_{d(on)}$	Turn-On Delay Time	V_{GS}=-10V,V_{DD}=-50V, R_L=0.75Ω， R_{GEN}=3Ω I_D=-15A	---	13	---	ns
T_r	Rise Time		---	51	---	
$T_{d(off)}$	Turn-Off Delay Time		---	177	---	
T_f	Fall Time		---	82	---	
C_{iss}	Input Capacitance	V_{DS}=-50V , V_{GS}=0V , f=1MHz	---	4200	---	pF
C_{oss}	Output Capacitance		---	536	---	
C_{rss}	Reverse Transfer Capacitance		---	52	---	

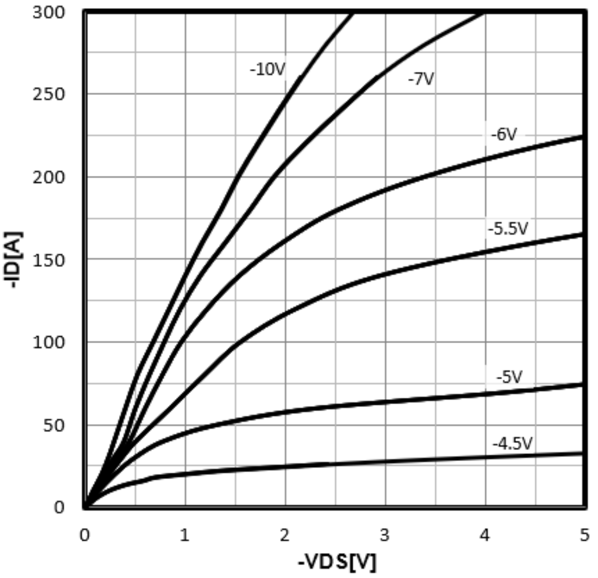
Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current[1,4]	V_G=V_D=0V , Force Current	---	---	-80	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=-15A , T_J=25℃	---	---	-1.2	V
t_{rr}	Reverse Recovery Time	IF=-15A , di/dt=100A/μs , T_J= 2 5 ℃	---	110	---	nS
Q_{rr}	Reverse Recovery Charge		---	590	---	nC

a1： Repetitive rating; pulse width limited by maximum junction temperature

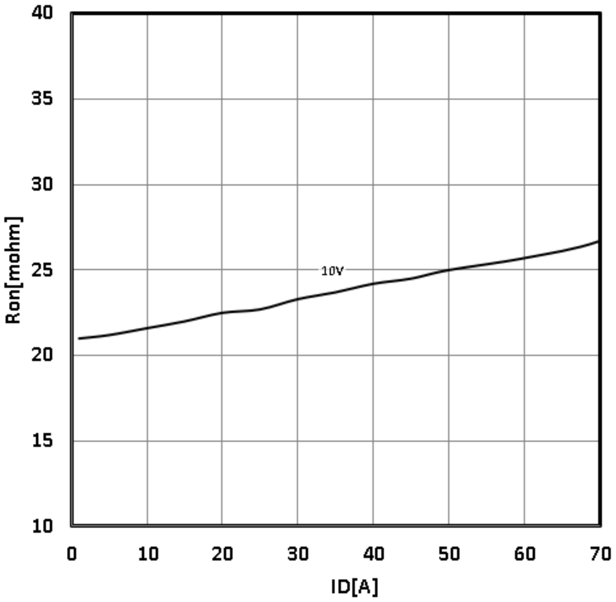
Typ. output characteristics

$I_D=f(V_{DS})$



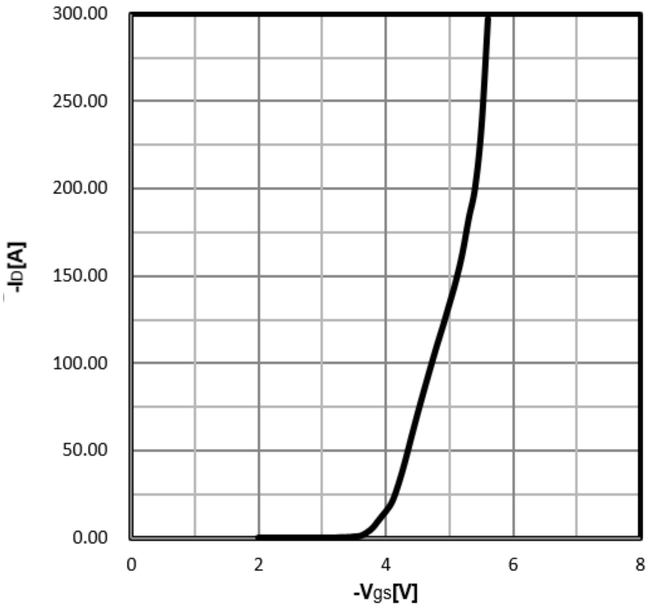
Typ. drain-source on resistance

$R_{DS(on)}=f(I_D)$



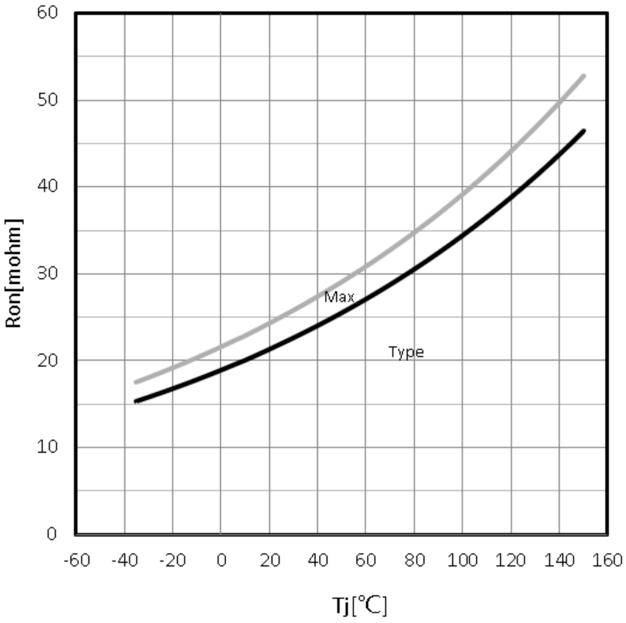
Typ. transfer characteristics

$I_D=f(V_{GS})$

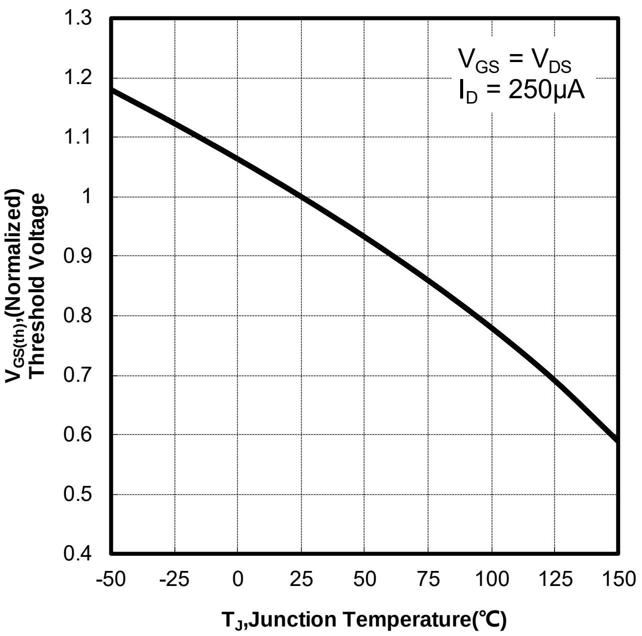


Drain-source on-state resistance

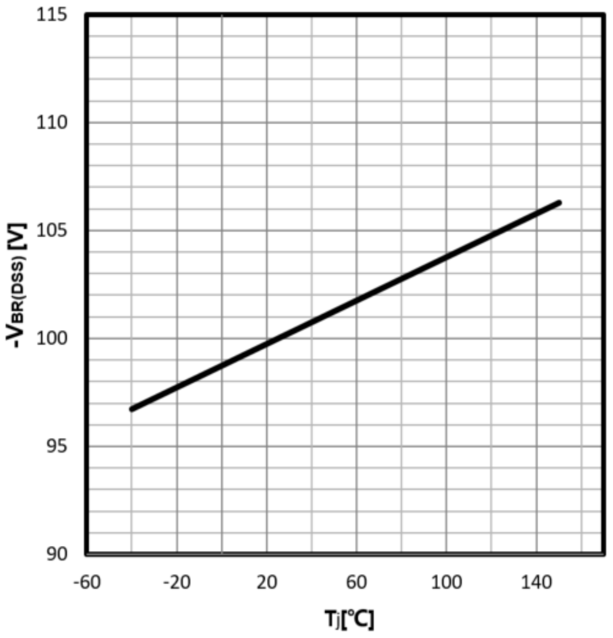
$R_{DS(on)}=f(T_j);I_D=-15A;\ V_{GS}=-10V$



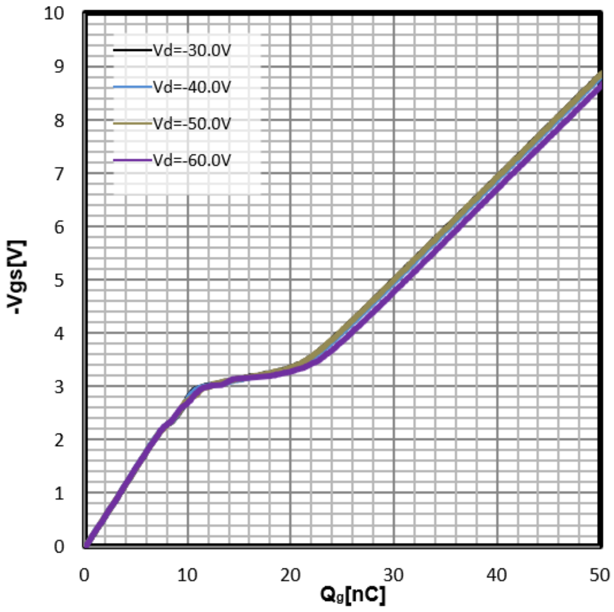
Gate Threshold Voltage
$-V_{TH}=f(T_j)$; I_D=-250uA



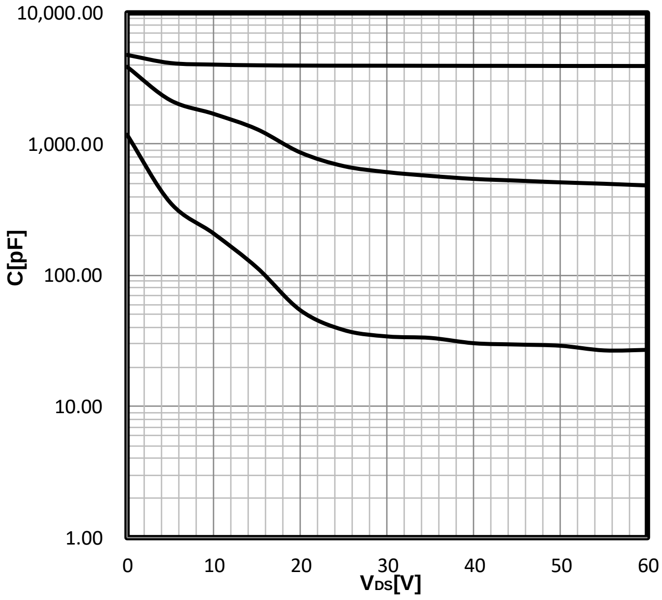
Drain-source breakdown voltage
$V_{BR(DSS)}=f(T_j)$; I_D=-250uA



Typ. gate charge
$V_{GS}=f(Q_{gate})$; I_D=-15A

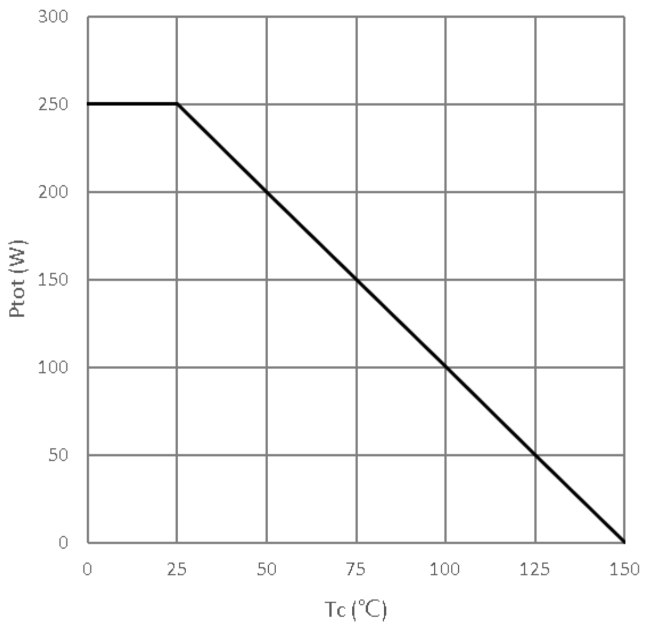


Typ. capacitances



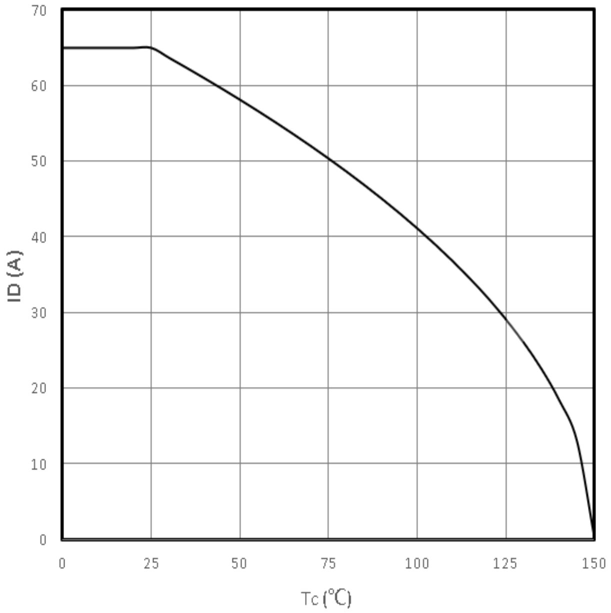
Power Dissipation

$P_{tot}=f(T_C)$



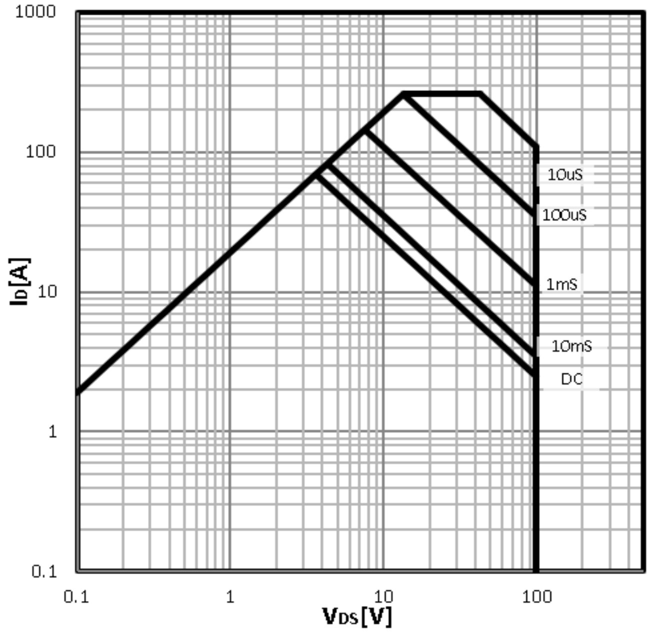
Maximum Drain Current

$-I_D=f(T_C)$



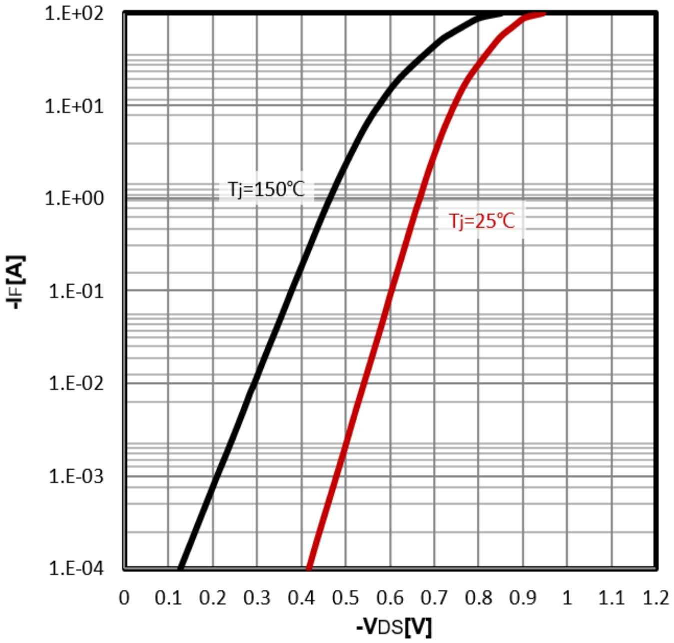
Safe operating area

$-I_D=f(-V_{DS})$



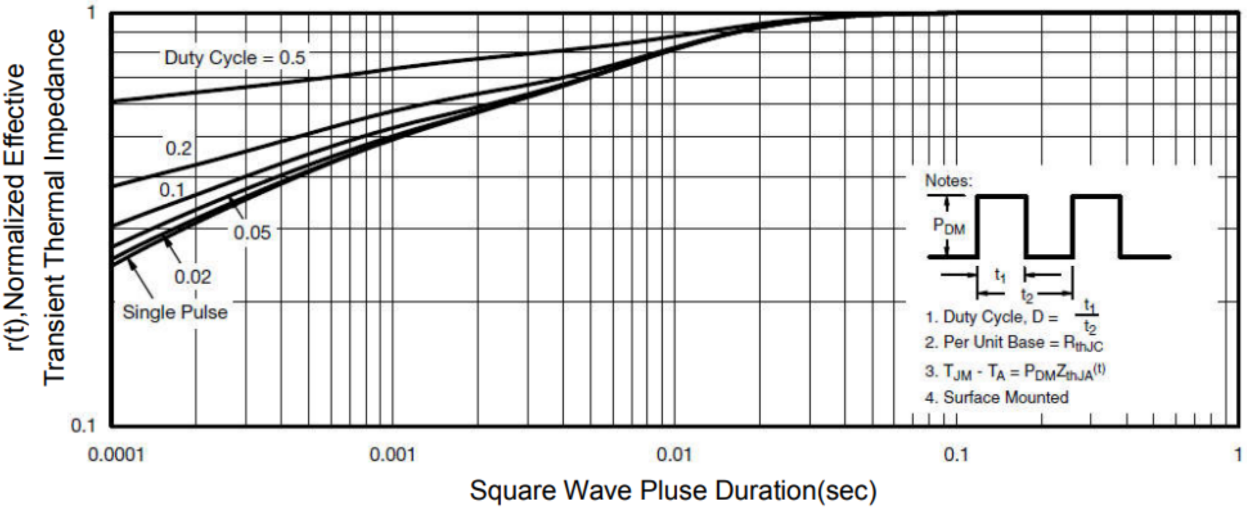
Body Diode Forward Voltage Variation

$-I_F=f(-V_{DS})$



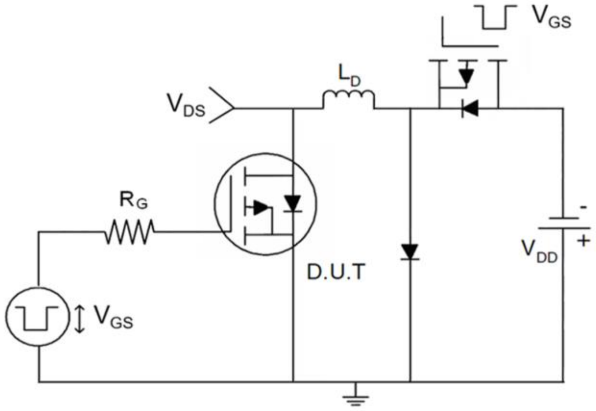
Max. transient thermal impedance

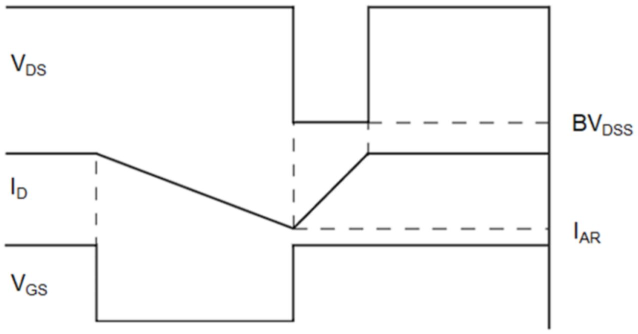
$Z_{thJC}=f(t_p)$



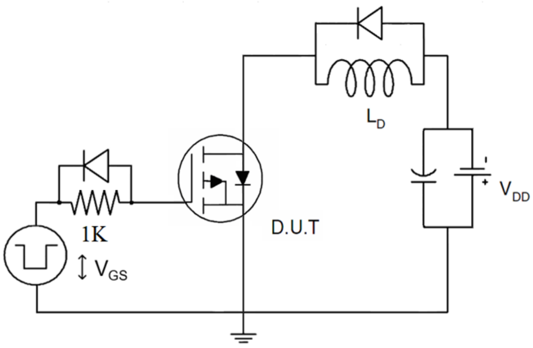
Test Circuit

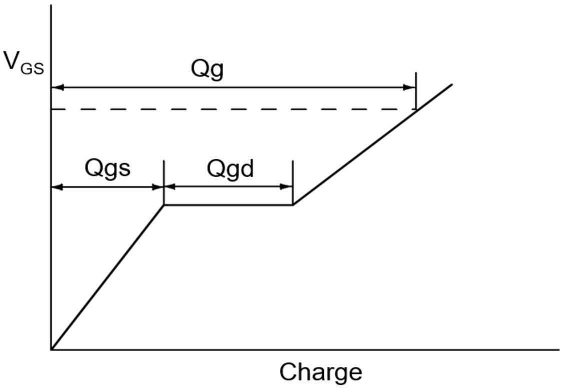
1) E_{AS} Test Circuits



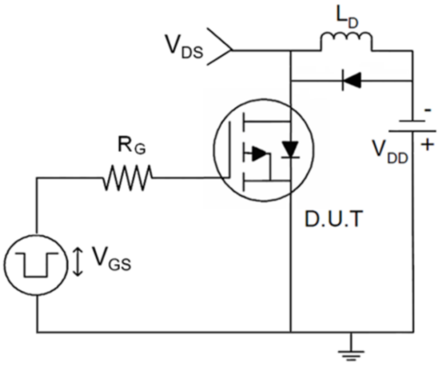


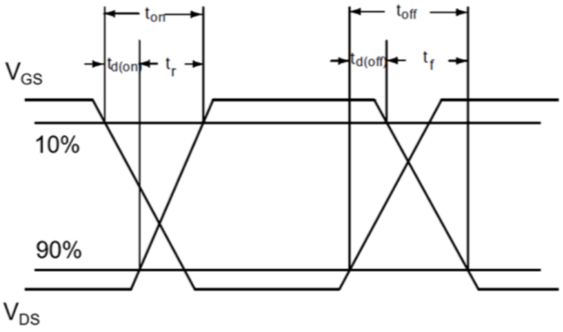
2) Gate Charge Test Circuit



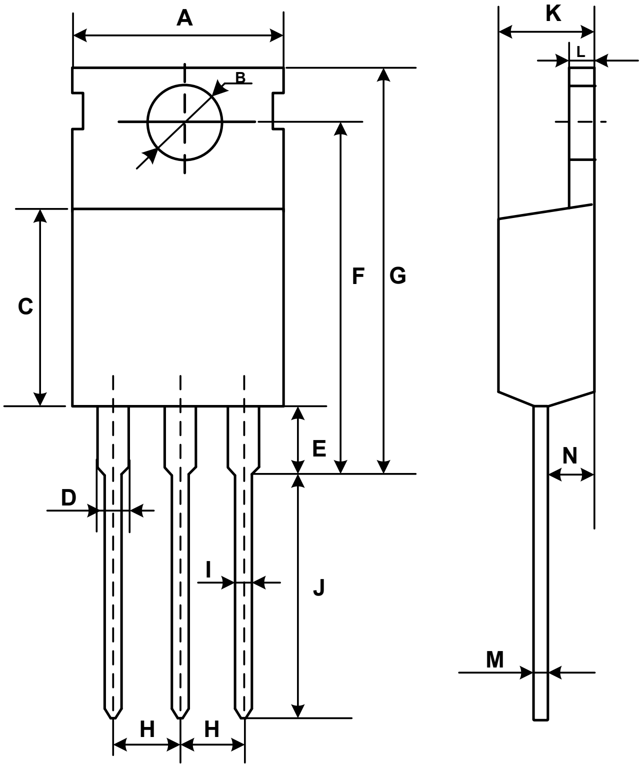


3) Switch Time Test Circuit





Mechanical Dimensions for TO-220



OMMON DIMENSIONS

SYMBOL	MM	
	MIN	MAX
A	9.70	10.30
B	3.40	3.80
C	8.80	9.40
D	1.17	1.47
E	2.60	3.50
F	15.10	16.70
G	19.55MAX	
H	2.54REF	
I	0.70	0.95
J	9.35	11.00
K	4.30	4.77
L	1.20	1.45
M	0.40	0.65
N	2.20	2.60