

Features

- Split Gate Trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$

Product Summary

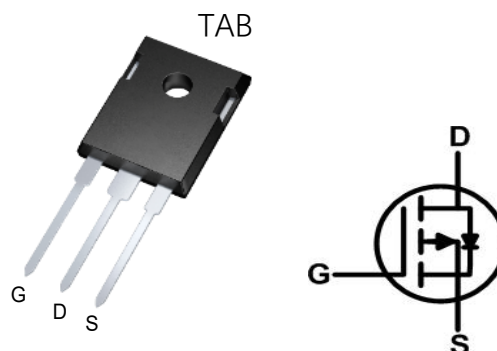


BVDSS	RDSON	ID
-100V	22 mΩ	-80 A

Applications

- DC-DC Converters
- Power management functions
- Synchronous-rectification applications

TO247 Pin Configuration



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

Symbol	Parameter		Value	Units
V_{DSS}	Drain-to-Source Voltage		-100	V
I_D	Continuous Drain Current	$T_C = 25^\circ\text{C}$	-80	A
	Continuous Drain Current	$T_C = 100^\circ\text{C}$	-41	A
I_{DM}^{a1}	Pulsed Drain Current		-260	A
V_{GS}	Gate-to-Source Voltage		± 20	V
P_D	Power Dissipation		250	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range		150, -55 to 150	$^\circ\text{C}$
T_L	Maximum Temperature for Soldering		260	$^\circ\text{C}$

Thermal Characteristics:

Symbol	Parameter	Value	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	0.5	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	62	$^\circ\text{C/W}$

Electrical Characteristics ($T_J = 25^\circ\text{C}$ unless otherwise specified):

Static Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
V_{DSS}	Drain to Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-100	--	--	V
I_{DSS}	Drain to Source Leakage Current	$V_{DS} = -100V, V_{GS}=0V$	--	--	1	μA
$I_{GSS(F)}$	Gate to Source Forward Leakage	$V_{GS} = -20V$	--	--	100	nA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	$V_{GS} = +20V$	--	--	-100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-2	-3	-4	V
$R_{DS(ON)}$	Drain-to-Source On-Resistance	$V_{GS}=-10V, I_D=-15A$	--	22	25	m Ω

Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
C_{iss}	Input Capacitance	$V_{GS}=0V$ $V_{DS}=-50V$ $f=1.0MHz$	--	4200	--	pF
C_{oss}	Output Capacitance		--	536	--	
C_{rss}	Reverse Transfer Capacitance		--	52	--	

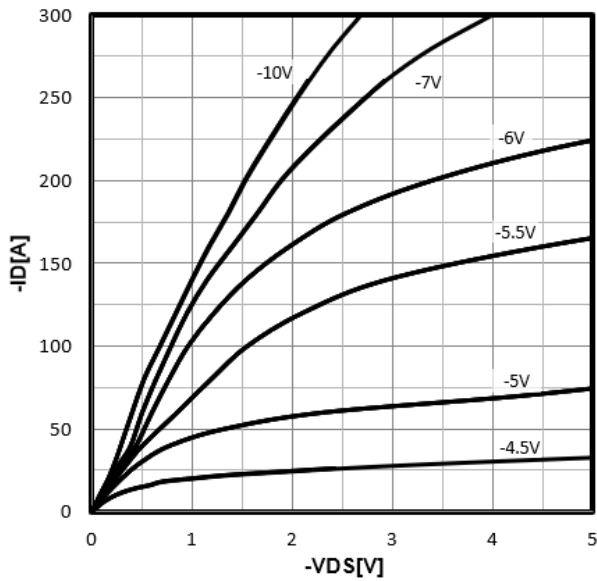
Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	$I_D=-15A, R_L=0.75\Omega$ $V_{DS} = -50V$ $V_{GS} = -10V$ $R_G = 3\Omega$	--	13	--	ns
t_r	Rise Time		--	51	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	177	--	
t_f	Fall Time		--	82	--	
Q_g	Total Gate Charge	$V_{GS}=-10V$ $V_{DS}=-50V$ $I_D=-15A$	--	76	--	nC
Q_{gs}	Gate Source Charge		--	13	--	
Q_{gd}	Gate Drain Charge		--	12.4	--	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
I_S	Diode Forward Current	$T_C=25^\circ\text{C}$	--	--	-80	A
V_{SD}	Diode Forward Voltage	$I_S=-15A, V_{GS}=0V$	--	--	-1.2	V
t_{rr}	Reverse Recovery time	$I_S=-15A, V_{DD}=-50V$ $dI/dt=100A/\mu s$	--	110	--	ns
Q_{rr}	Reverse Recovery Charge		--	590	--	nC

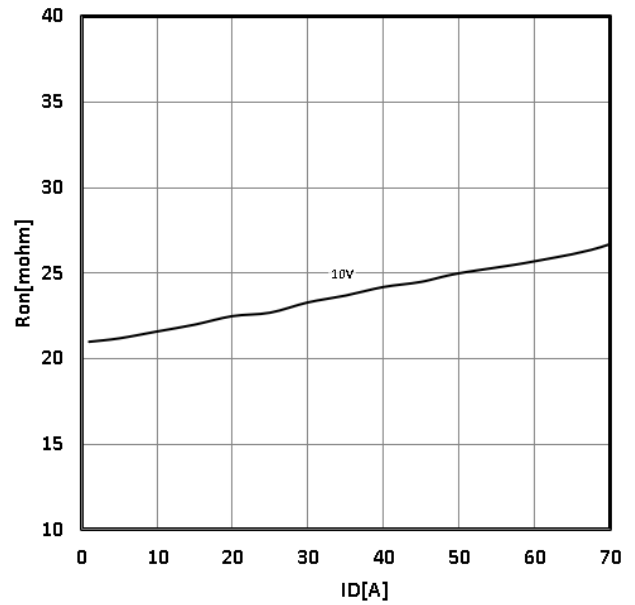
a1: Repetitive rating; pulse width limited by maximum junction temperature

P-Ch 100V Fast Switching MOSFETs

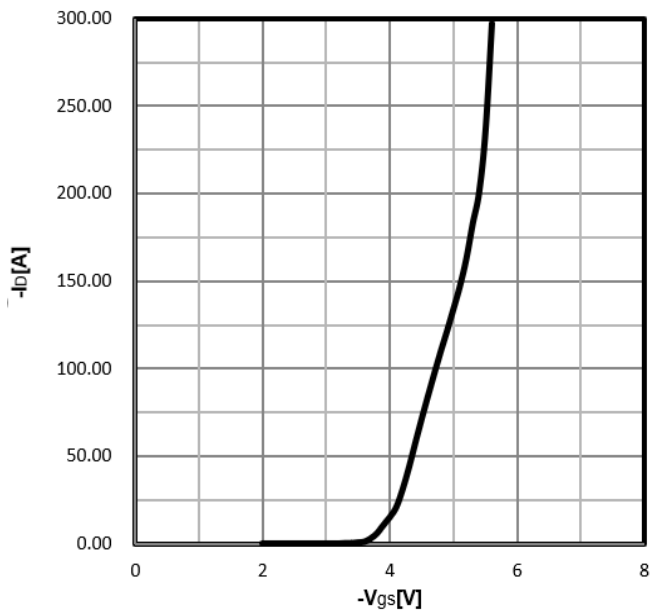
Typ. output characteristics
 $I_D = f(V_{DS})$



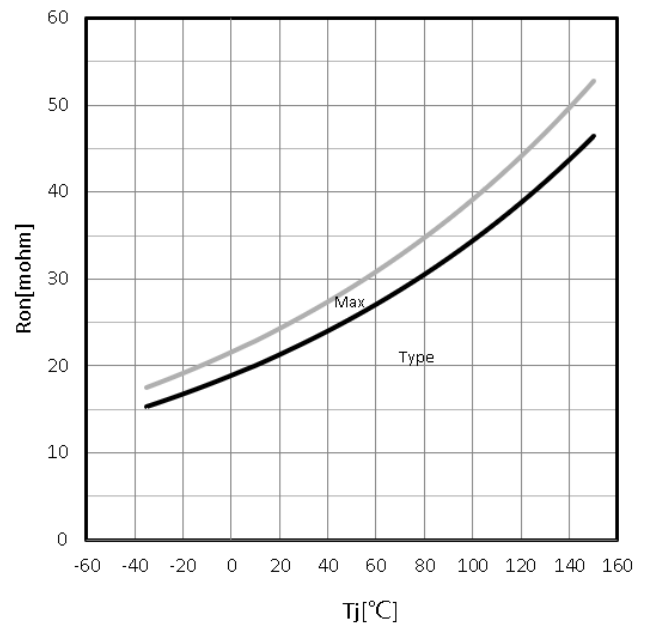
Typ. drain-source on resistance
 $R_{DS(on)} = f(I_D)$



Typ. transfer characteristics
 $I_D = f(V_{GS})$



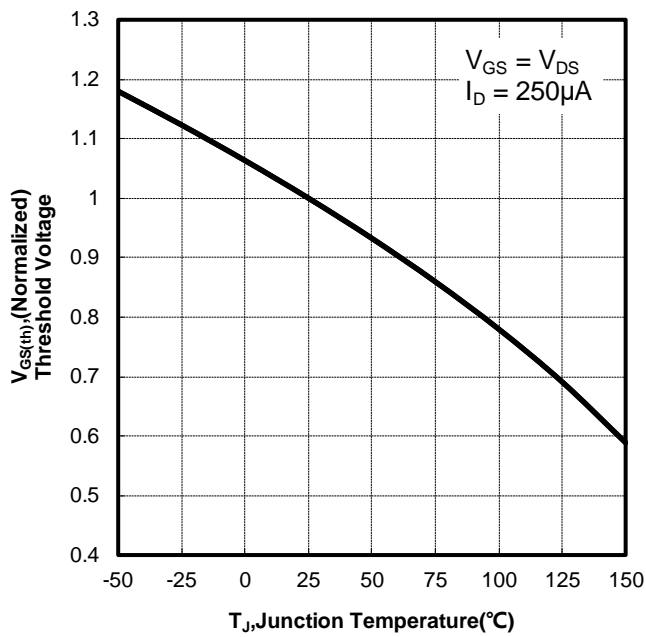
Drain-source on-state resistance
 $R_{DS(on)} = f(T_j); I_D = -15A; V_{GS} = -10V$



P-Ch 100V Fast Switching MOSFETs

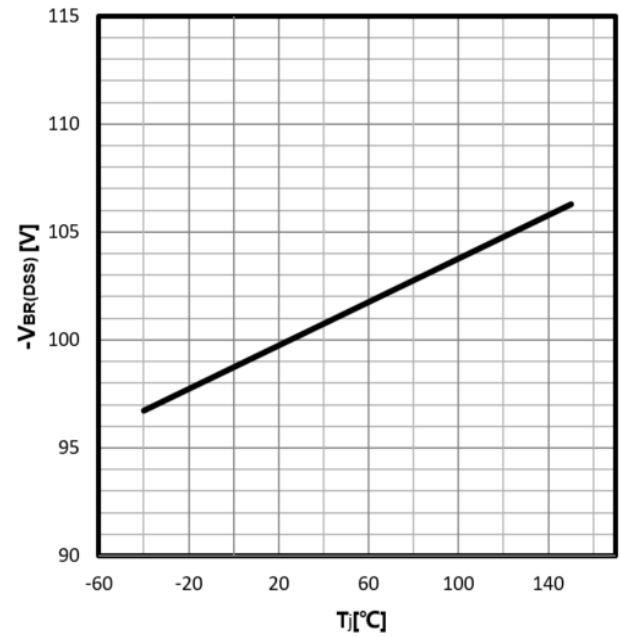
Gate Threshold Voltage

$$-V_{TH}=f(T_j); I_D=-250\mu A$$



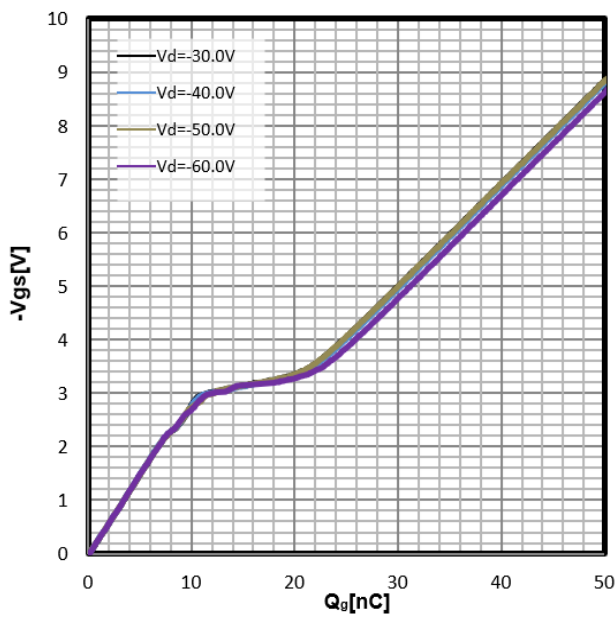
Drain-source breakdown voltage

$$V_{BR(DSS)}=f(T_j); I_D=-250\mu A$$

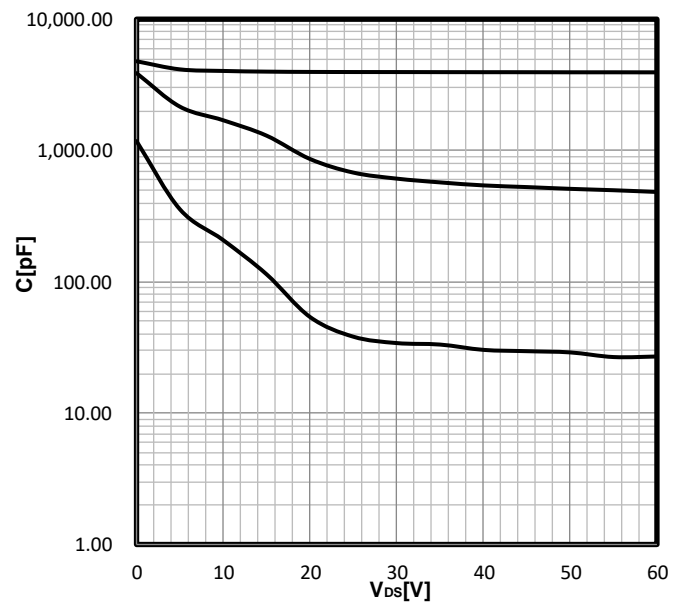


Typ. gate charge

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



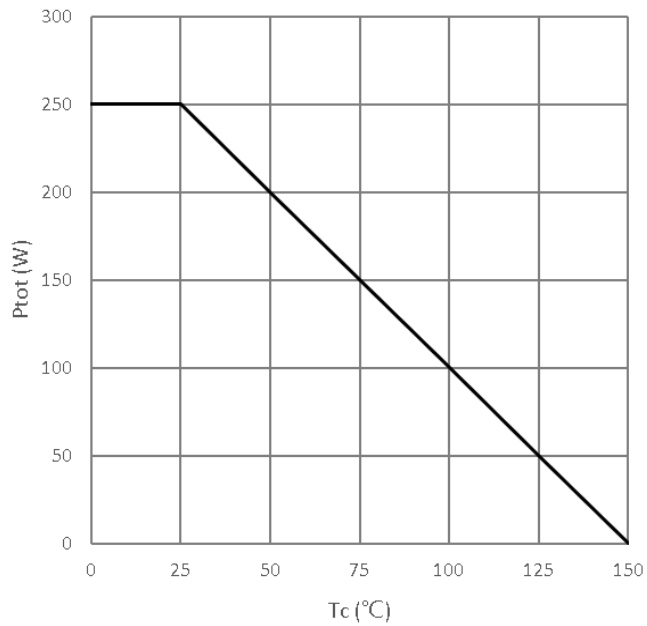
Typ. capacitances



P-Ch 100V Fast Switching MOSFETs

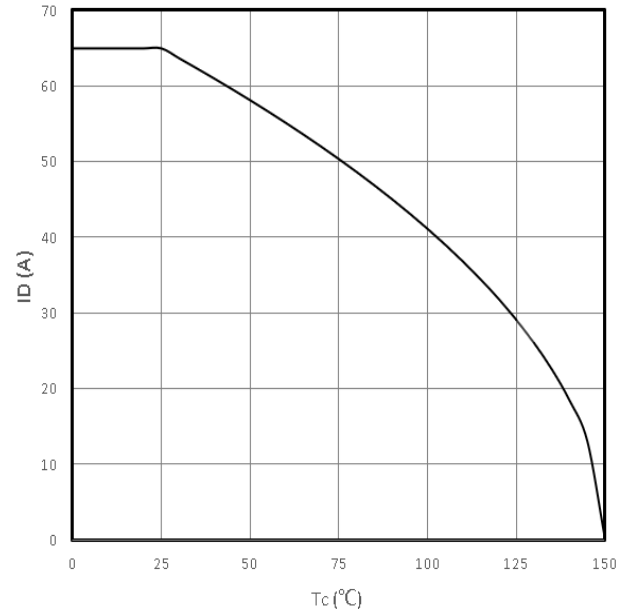
Power Dissipation

$$P_{tot}=f(T_C)$$



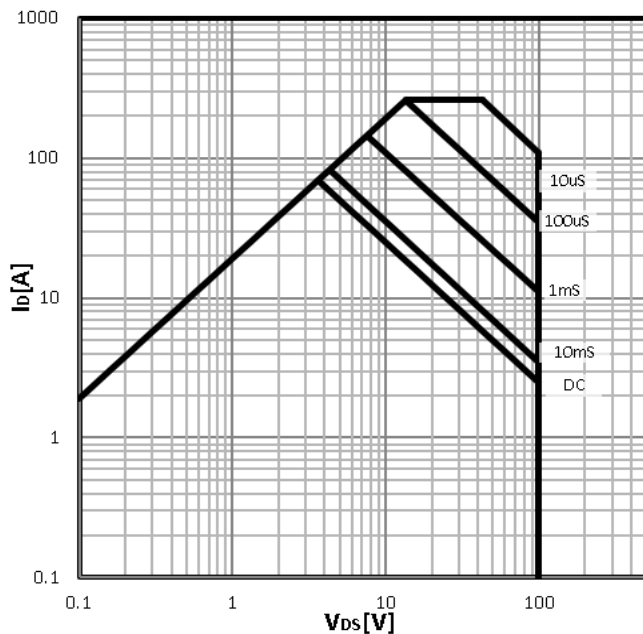
Maximum Drain Current

$$-I_D=f(T_C)$$



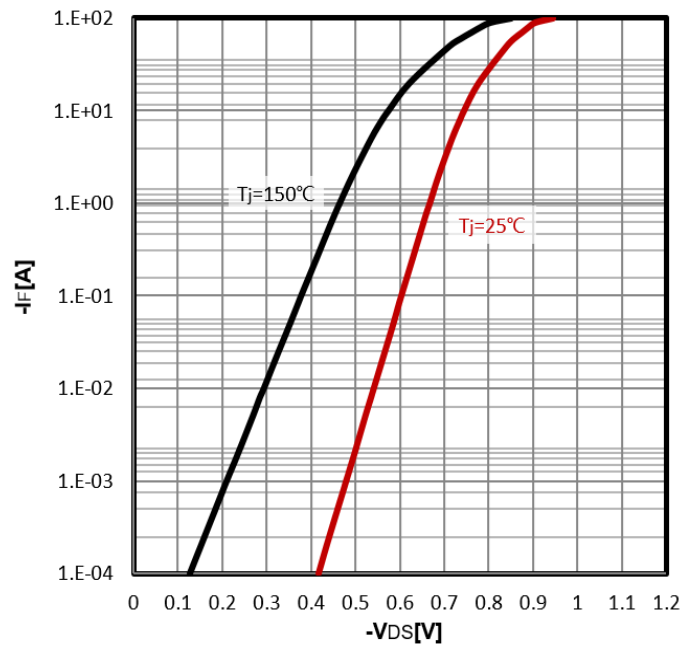
Safe operating area

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



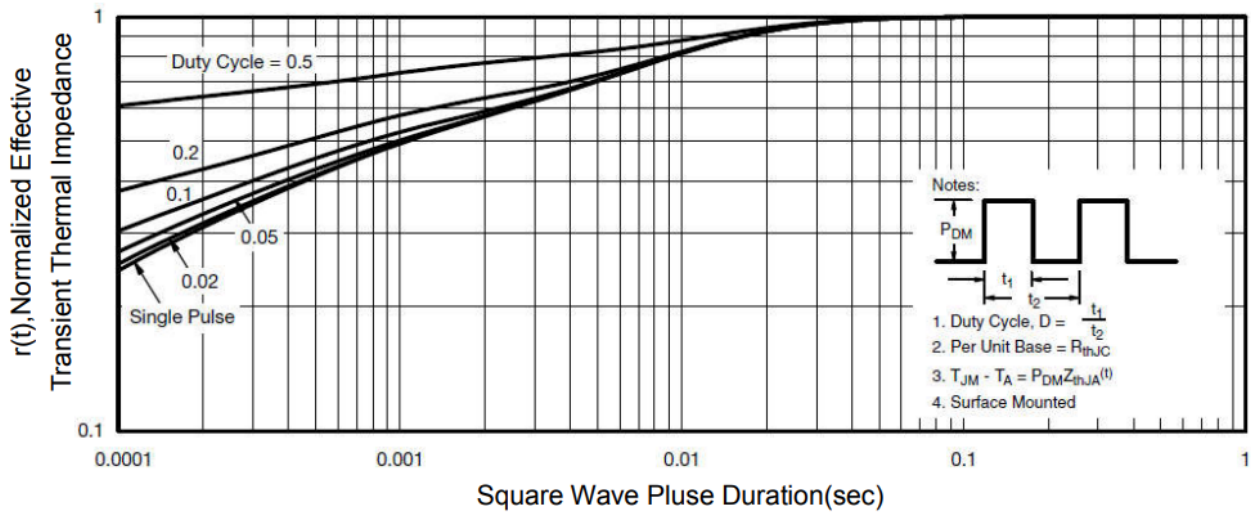
Body Diode Forward Voltage Variation

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



Max. transient thermal impedance

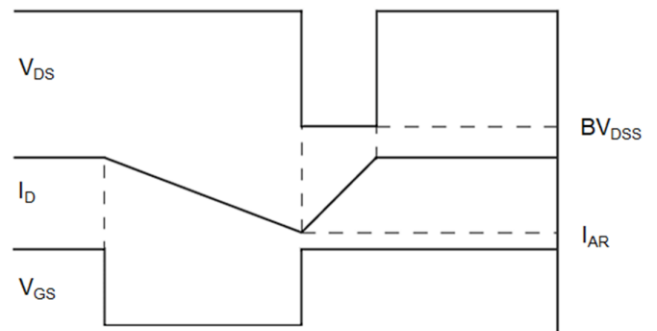
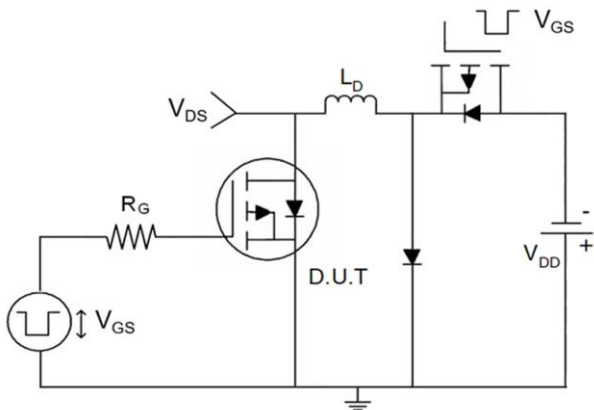
$$Z_{thJC}=f(t_p)$$



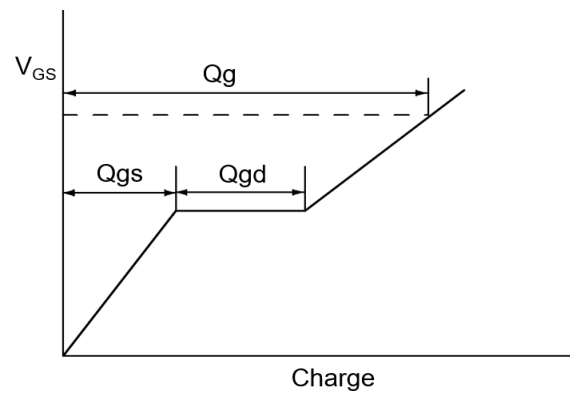
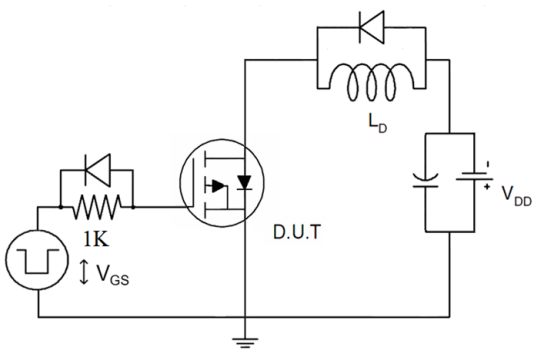
Test Circuit

P-Ch 100V Fast Switching MOSFETs

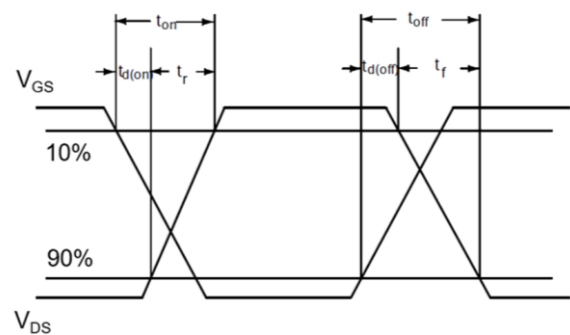
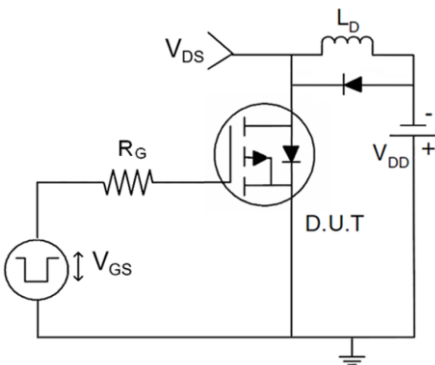
1) E_{AS} Test Circuits



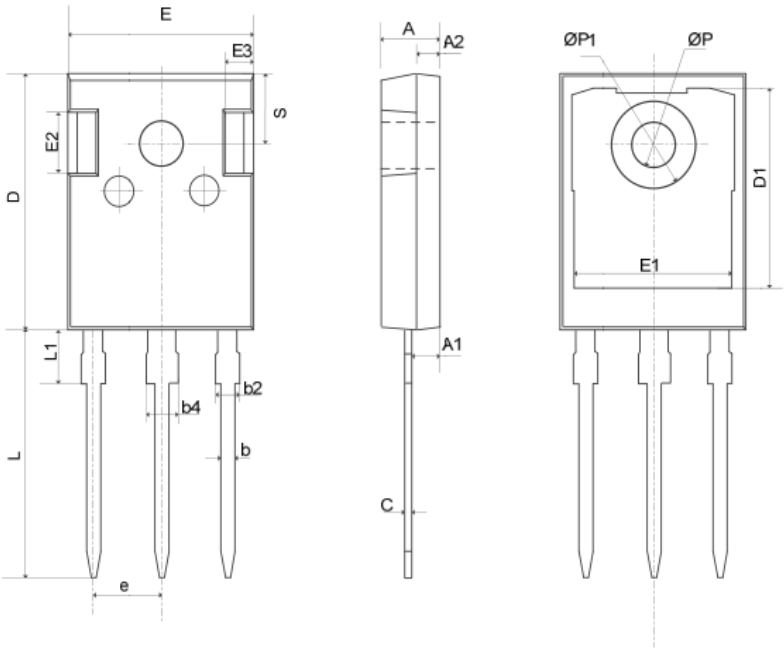
2) Gate Charge Test Circuit



3) Switch Time Test Circuit



Mechanical Dimensions for TO-247



COMMON DIMENSIONS

SYMBOL	MM	
	MIN	MAX
A	4.80	5.20
A1	2.21	2.61
A2	1.85	2.15
b	1.11	1.36
b2	1.91	2.21
b4	2.91	3.21
c	0.51	0.75
D	20.70	21.30
D1	16.25	16.85
E	15.50	16.10
E1	13.00	13.60
E2	4.80	5.20
E3	2.30	2.70
e	5.44BSC	
L	19.62	20.22
L1	—	4.30
ØP	3.40	3.80
ØP1	—	7.30
S	6.15BSC	