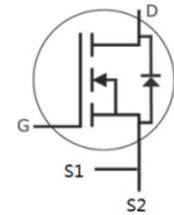


N-CHANNEL SiC POWER MOSFET

Features

- $R_{DS(on)}=30m\Omega$ (Typ.) @ $V_{GS}=20V, I_D=55A$
- High Blocking Voltage with Low On-Resistance
- High Speed Switching with Low Capacitance
- Easy to Parallel and Simple to Drive



S1: Driver Source
S2: Power Source

Applications

- Solar inverters
- DC/DC converters
- Motor drives
- Switch Mode Power Supplies

Key Performance and Package Parameters

Order codes	V_{DS}	I_D	$R_{DS(ON)}$, Typ	T_{vjmax}	Marking	Package
XD030B065BV1S5	650V	55A	30m Ω	175 $^{\circ}C$	D30B65BV1	TO247-4

Absolute Maximum Ratings ($T_c=25^{\circ}C$ unless otherwise specified.)

Symbol	Parameter	Value	Units
V_{DSS}	Drain-Source Voltage	650	V
V_{GSmax}	Absolute maximum Gate-Source Voltage	-8/+22	V
V_{GSop}	Recommended operational Gate-Source Voltage	-4/+18	V
I_D	Continuous Drain Current ($T_c=25^{\circ}C$)	55	A
I_{DM}	Pulsed Drain Current	197	A
P_D	Maximum Power Dissipation ($T_c=25^{\circ}C$)	187	W
T_J	Operating Junction Temperature Range	-40 to 175	$^{\circ}C$
T_{STG}	Storage Temperature Range	-40 to 175	$^{\circ}C$

Thermal Data

Symbol	Parameter	Conditions	Max.	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case (Steady State)	TO247-4	0.8	$^{\circ}C/W$

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=1mA$	650	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=650V, V_{GS}=0V$	---	1	50	μA
I_{GSS}	Gate Leakage Current, Forward	$V_{GS}=18V, V_{DS}=0V$	---	10	250	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=10mA$	1.8	2.6	4.3	V
$R_{DS(ON)}$	Drain-Source On-state Resistance	$V_{GS}=18V, I_{DS}=25A$	---	30	50	$m\Omega$
Q_g	Total Gate Charge	$V_{DS}=400V$	---	110	---	nC
Q_{gs}	Gate-Source Charge	$V_{GS}=-4V/18V$	---	30	---	nC
Q_{gd}	Gate-Drain Charge	$I_{DS}=25A$	---	32	---	nC
$t_{d(on)}$	Turn-on Delay Time	$V_{DD}=400V,$	---	14	---	ns
t_r	Rise Time	$V_{GS}=-4V/18V$	---	15	--	ns
$t_{d(off)}$	Turn-off Delay Time	$I_{DS}=25A, R_G=16\Omega$	---	28	---	ns
t_f	Fall Time		---	8	---	ns
C_{iss}	Input Capacitance	$V_{DS}=400V$	---	2000	---	pF
C_{oss}	Output Capacitance	$V_{GS}=0V$	---	180	---	pF
C_{rss}	Reverse Transfer Capacitance	$f=1MHz$	---	19	---	pF

Reverse Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
V_{SD}	Diode Forward Voltage	$I_{SD}=12.5A, V_{GS}=-4V$	---	4.2	---	V
t_{rr}	Diode Reverse Recovery Time	$V_R=400V, I_{SD}=25A,$ $di_F/dt=1000A/s$	---	25	---	ns
Q_{rr}	Diode Reverse Recovery Charge		---	100	---	nC
I_{rrm}	Peak Reverse Recovery Current		---	5	---	A

Typical Characteristics

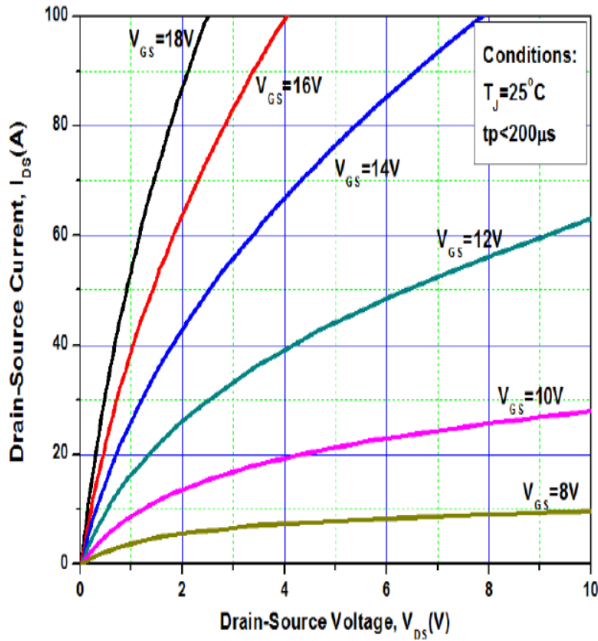


Fig.1 Output Characteristics

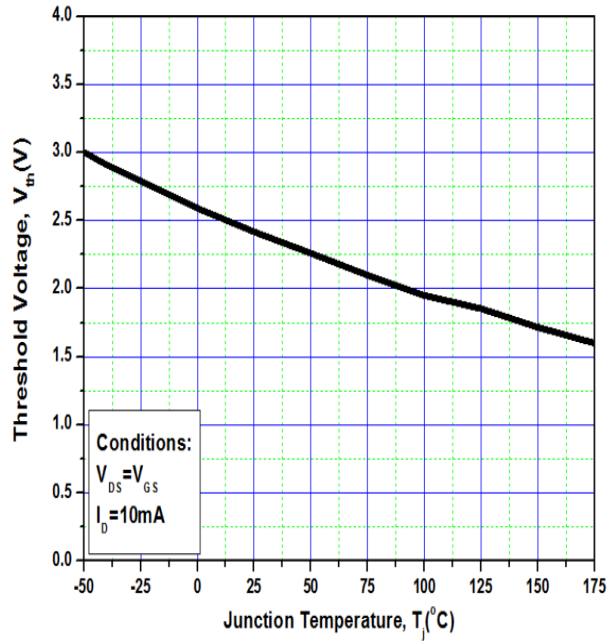


Fig.2 Threshold Voltage

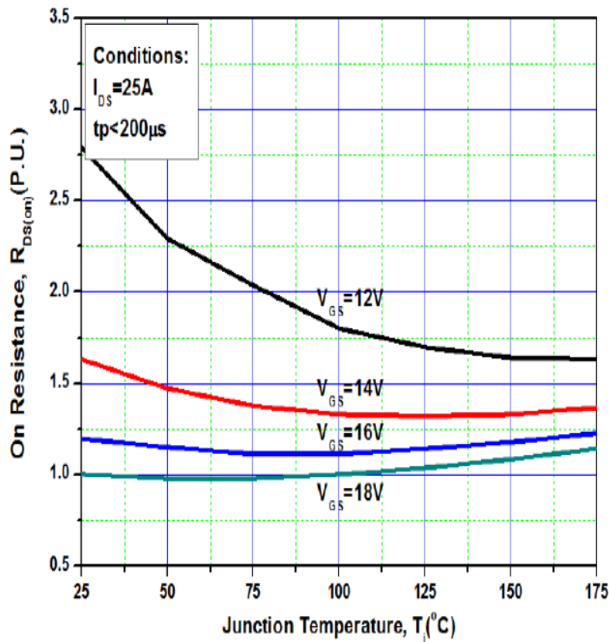


Fig.3 Drain-Source On Resistance

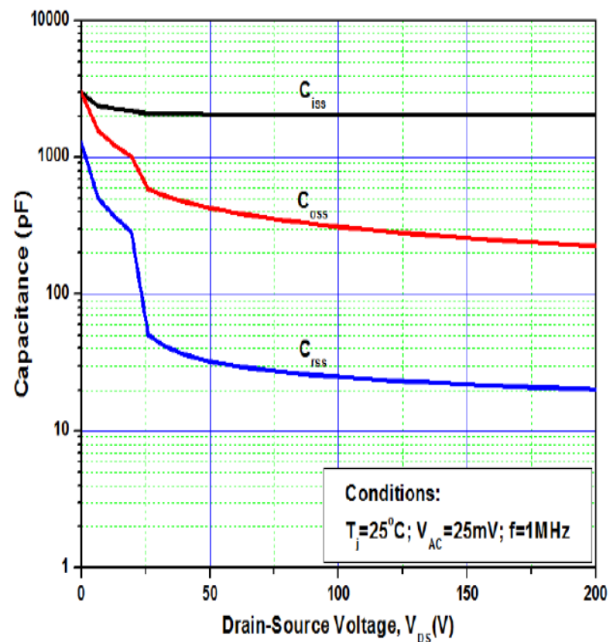


Fig.4 Capacitance

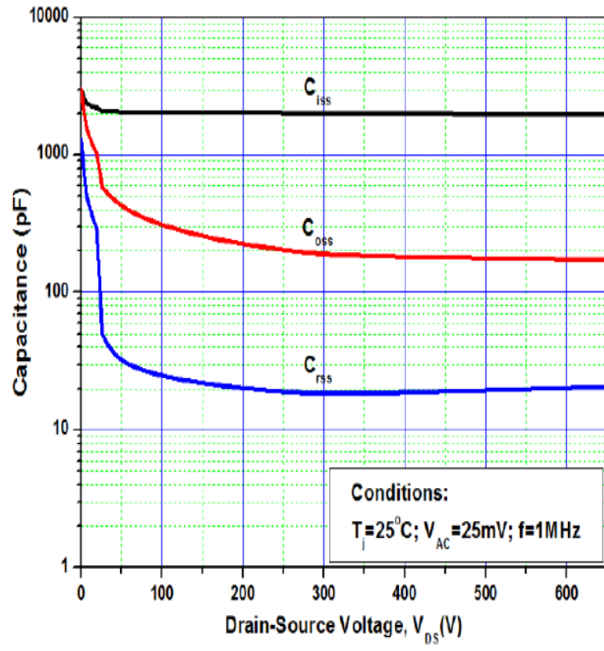
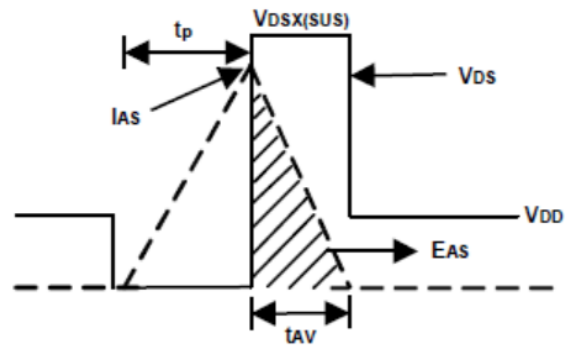
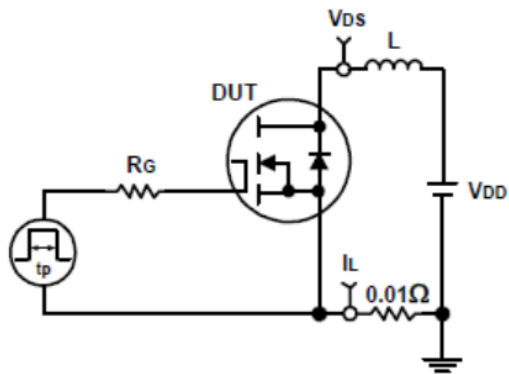
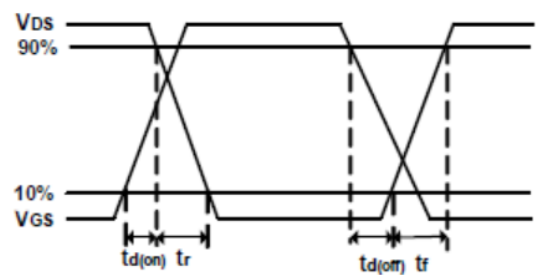
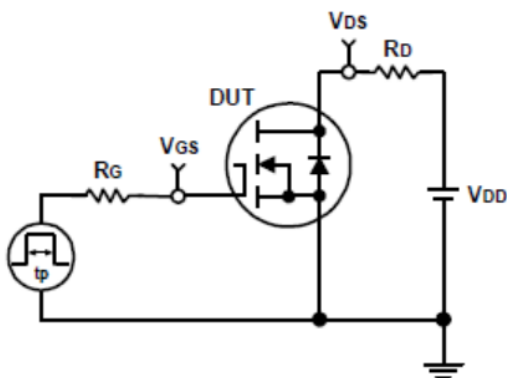


Fig.5 Capacitance

Avalanche Test Circuit and Waveforms

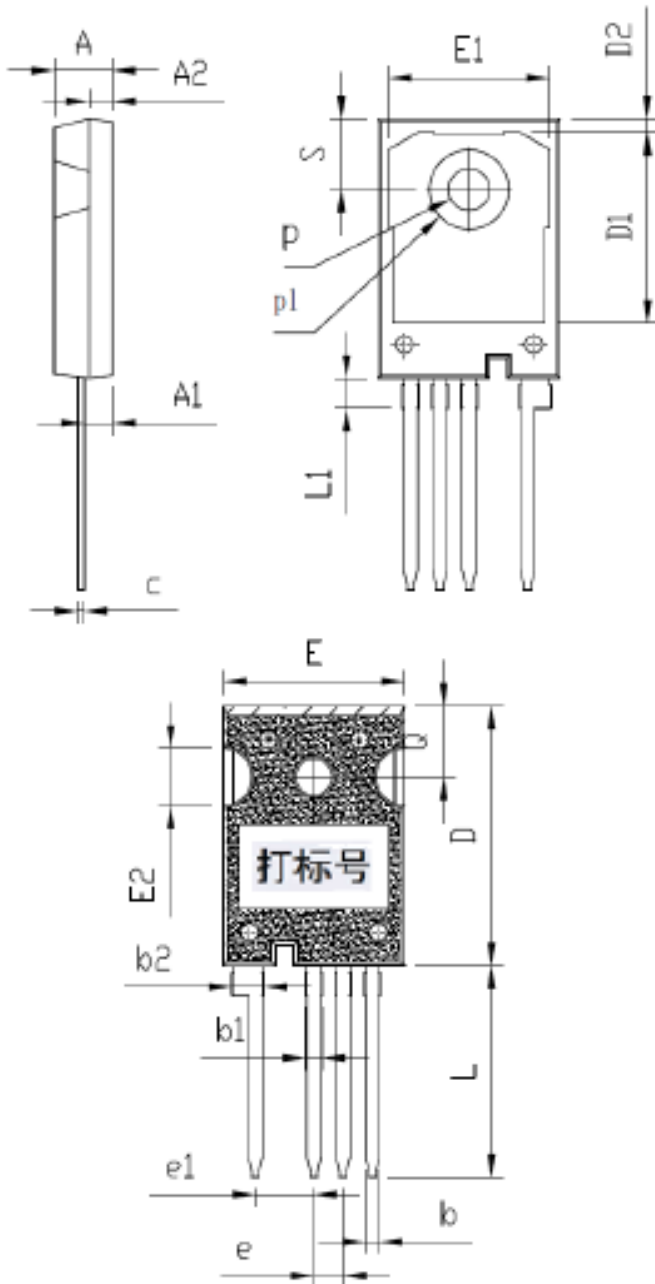


Switching Time Test Circuit and Waveforms



Package Information

TO-247-4



SYMBOLS	DIMENSIONS IN MILLIMETERS		
	MIN	NOM	MAX
A		5.00	
A1		2.40	
A2		2.00	
b		1.20	
b1		1.30	
b2		2.65	
c		0.6	
D		22.54	
D1		16.50	
D2		1.17	
e		2.54	
e1		5.08	
E		15.80	
E1		14.00	
E2		5.00	
L		18.38	
L1		2.58	
p		3.60	
p1		6.80	
Q		6.15	
S		6.15	