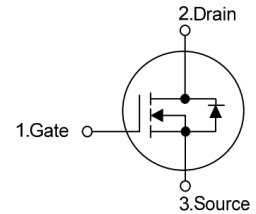
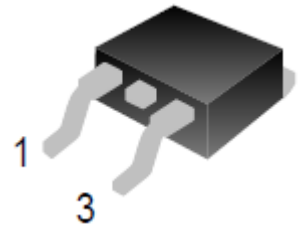


180A,100V N-CHANNEL POWER MOSFET

Features

- $R_{DS(on)}=2.65m\Omega$ (Typ.) @ $V_{GS}=10V, I_D=50A$
- New technology for high voltage device
- Low on-resistance
- Fast switching



Applications

- Motor Drives
- DC-DC Converter
- Uninterruptible Power Supply

Key Performance and Package Parameters

Order codes	V_{DS}	I_D	$R_{DS(ON)}$, Typ	T_{vjmax}	Marking	Package
XD2R6S010AE1R3	100V	180A	2.65m Ω	150 $^{\circ}C$	D2R6S10AE1	TO263

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

Symbol	Parameter	Value	Units
V_{DSS}	Drain-Source Voltage	100	V
V_{GSS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current (T _c =25 $^{\circ}C$)	180	A
I_{DM}	Pulsed Drain Current	720	A
P_D	Maximum Power Dissipation (T _c =25 $^{\circ}C$)	417	W
E_{AS}	Avalanche Energy, Single Pulse (note1)	2245	mJ
T_J	Operating Junction Temperature Range	-55 to 150	$^{\circ}C$
T_{STG}	Storage Temperature Range	-55 to 150	$^{\circ}C$

Thermal Data

Symbol	Parameter	Conditions	Max.	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case (Steady State)	TO263	0.3	$^{\circ}C/W$

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	100	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=100V, V_{GS}=0V$	---	---	1	μA
I_{GSS}	Gate Leakage Current, Forward	$V_{GS}=20V, V_{DS}=0V$	---	---	100	nA
	Gate Leakage Current, Reverse	$V_{GS}=-20V, V_{DS}=0V$	---	---	-100	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	2	---	4	V
$R_{DS(ON)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_{DS}=50A$	--	2.25	2.65	$m\Omega$
Q_g	Total Gate Charge	$V_{DD}=80V$	---	193.2	---	nC
Q_{gs}	Gate-Source Charge	$V_{GS}=10V$	---	55	---	nC
Q_{gd}	Gate-Drain Charge	$I_D=50A$	---	56.4	---	nC
$t_{d(on)}$	Turn-on Delay Time	$V_{DD}=50V, V_{GS}=10V$ $I_D=50A, R_G=10\Omega$	---	111.4	---	ns
t_r	Turn-on Rise Time		---	200.9	--	ns
$t_{d(off)}$	Turn-off Delay Time		---	180	---	ns
t_f	Turn-off Fall Time		---	82.5	---	ns
C_{iss}	Input Capacitance	$V_{DS}=50V$	---	11815	---	pF
C_{oss}	Output Capacitance	$V_{GS}=0V$	---	1581	---	pF
C_{rss}	Reverse Transfer Capacitance	$f=250kHz$	---	16.6	---	pF

Diode Characteristics ($T_c=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
V_{SD}	Diode Forward Voltage	$I_S=50A, V_{GS}=0V$	---	---	1.1	V
t_{rr}	Diode Reverse Recovery Time	$I_S=50A,$ $di_f/dt=200A/\mu s$	---	67.3	---	ns
Q_{rr}	Diode Reverse Recovery Charge		---	258.7	---	nC

Notes:

1. $V_{DD}=70V, V_{GS}=10V, I_{AS}=67A, L=1mH,$ starting, $T_J=25^{\circ}\text{C}.$

Typical Characteristics

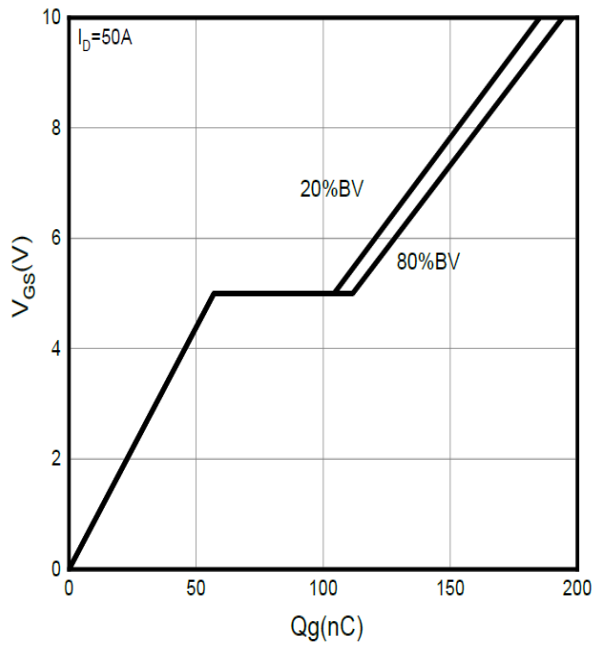


Fig.1 Gate Charge

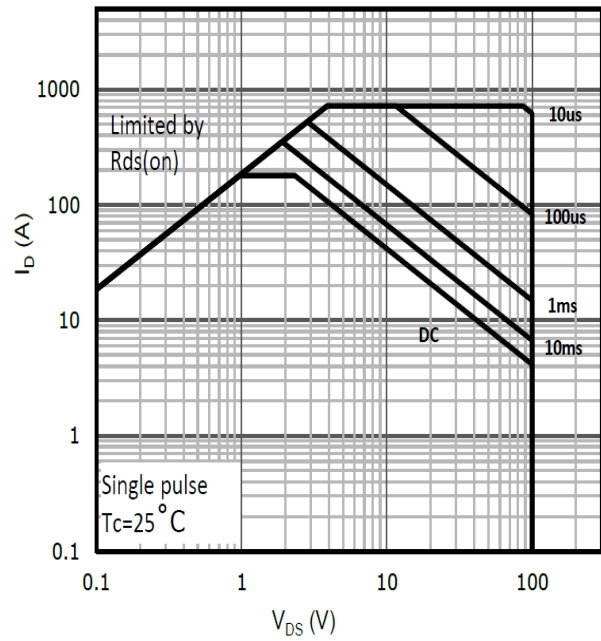


Fig.2 Safe Operation Area

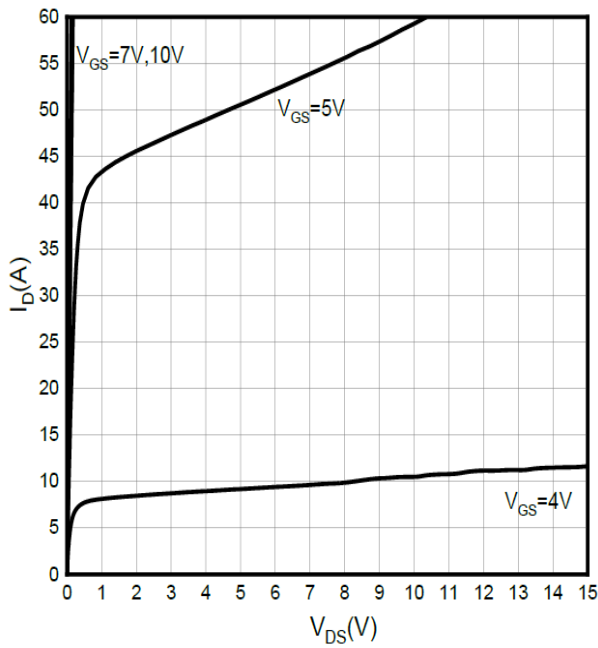


Fig.3 Output Characteristics

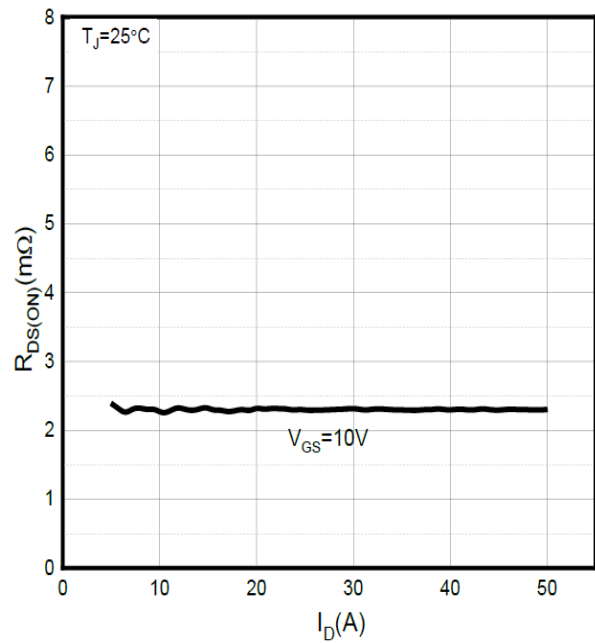


Fig.4 Drain-Source On Resistance

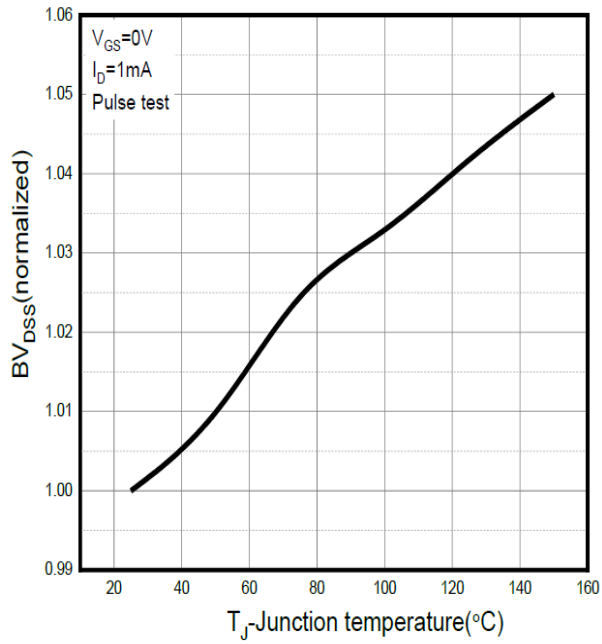


Fig.5 Drain-Source Breakdown Voltage

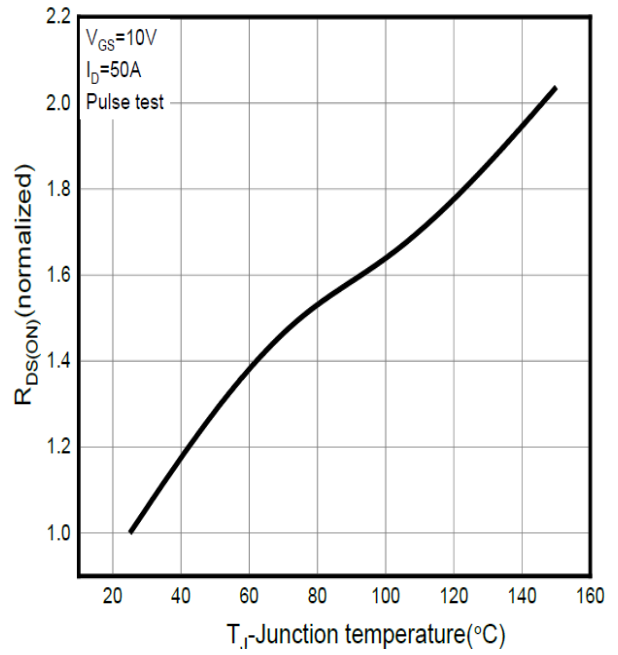


Fig.6 Drain-Source On Resistance

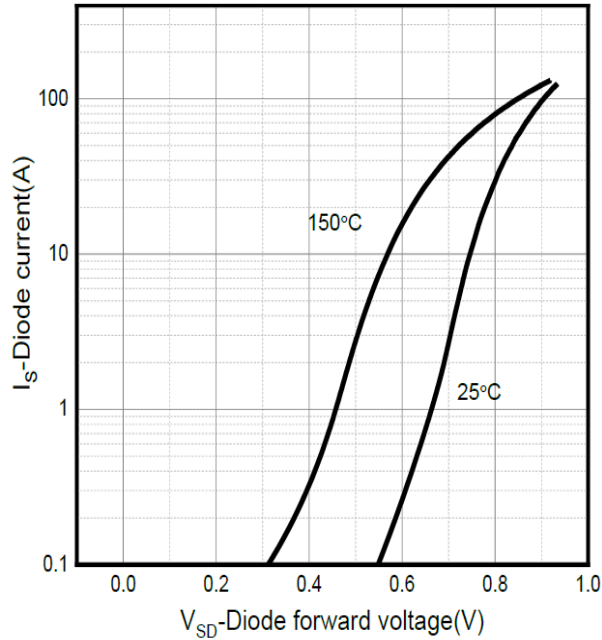


Fig.7 Source-Drain Diode Forward Current

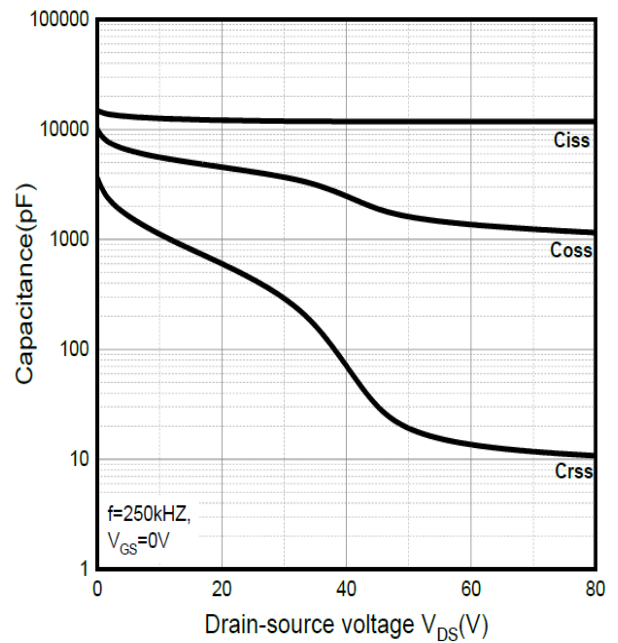
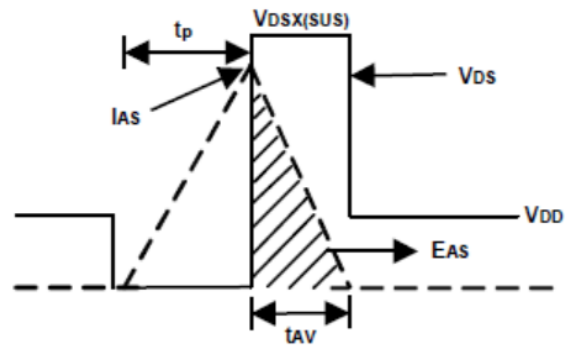
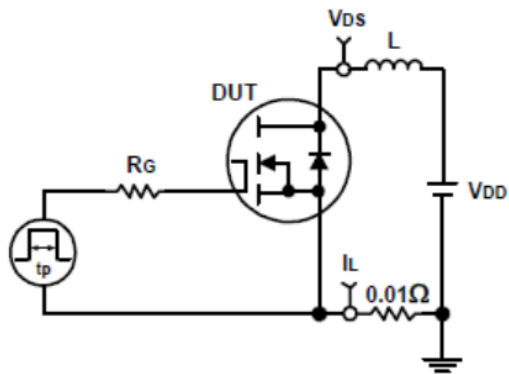
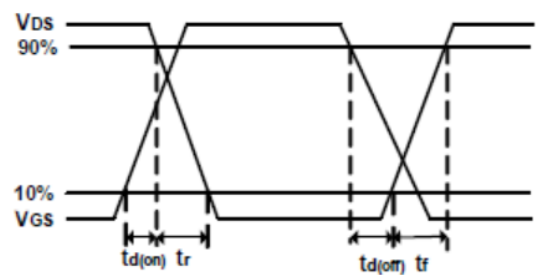
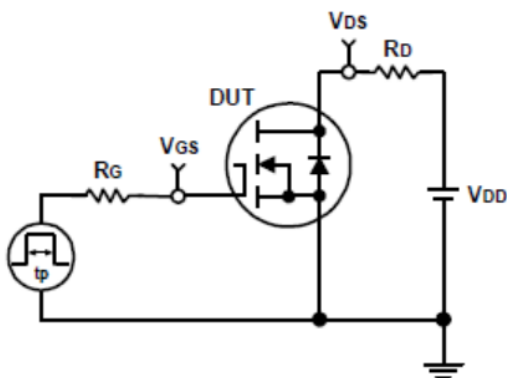


Fig.8 Capacitance

Avalanche Test Circuit and Waveforms

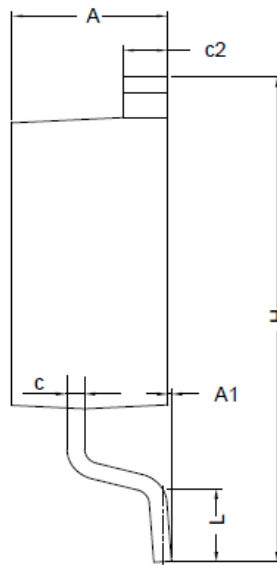
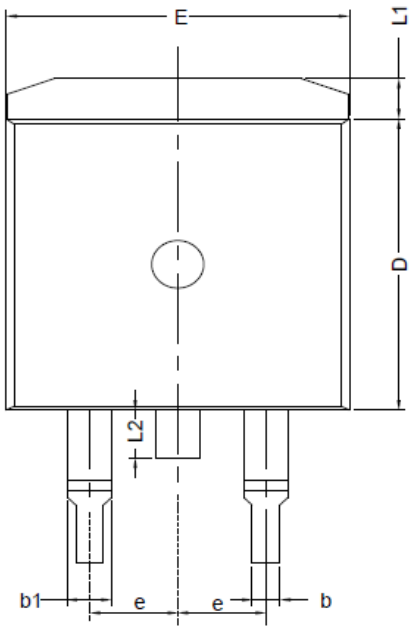


Switching Time Test Circuit and Waveforms



Package Information

TO-263



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	4.30	4.57	4.72
A1	0	0.10	0.25
b	0.71	0.81	0.91
b1	1.17	—	1.50
c	0.30	—	0.60
c2	1.17	1.27	1.37
D	8.50	—	9.35
E	9.80	—	10.45
e	2.54BSC		
H	14.70	—	15.75
L	2.00	2.30	2.74
L1	1.12	1.27	1.42
L2	—	—	1.75