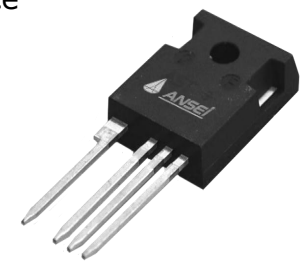
ANC150P075B3P

SiC N-MOSFET 750V, 11mΩ, 150A

Features

- High Blocking Voltage with Low On-Resistance
- High Speed Switching with Low Capacitances
- Avalanche Ruggednes

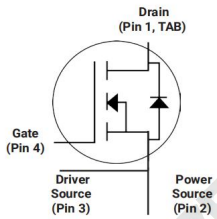


Product Summary

V_{DS}	750V
$R_{DS(on)\_typ}$	11mΩ
I_D	150A

Applications

- Solar Inverters
- Switch Mode Power Supplies
- High Voltage DC-DC Converters
- Batterry Chargers



Package Marking and Ordering Information

Part #	Marking	Package
ANC150P075B3P	AM11075K	TO-247-4

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	750	V
Continuous drain current T_C = 25°C , V_{GS}= 18V T_C = 125°C, V_{GS} = 18V	I_D	150 89	A
Source current(Body Diode) T_C = 25°C , V_{GS}= -4V T_C = 125°C, V_{GS} = -4V	I_S	150 89	A
Pulsed drain current (T_C = 25°C, t_p limited by T_{jmax})	I_{DM}	398	A
Avalanche energy, single pulse (L=10mH)	E_{AS}	1400	mJ
Gate-Source voltage	V_{GS}	-4/+18	V
Gate-Source voltage（Absolute maximum values）	V_{GSmax}	-8/+22	V
Power dissipation (T_C = 25°C)	P_{tot}	429	W
Operating junction and storage temperature	T_j , T_{stg}	-55...+175	°C

•Example of acceptable V_{GS} waveform

Thermal Resistance

Parameter	Symbol	Value	Unit
Thermal resistance, junction – case. Max	R_{thJC}	0.35	°C/W
Thermal resistance, junction – ambient. Max	R_{thJA}	40	

Electrical Characteristic (at Tj = 25 °C, unless otherwise specified)

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Static Characteristic						
Drain-source breakdown voltage	$V_{(BR)DSS}$	750	-	-	V	V_{DS}=0V, I_D =100uA
Gate threshold voltage	$V_{GS(th)}$	2	2.8	4	V	V_{DS} =V ,I_D =36mA
Zero gate voltage drain current	I_{DSS}	- -	1 5	5 -	μA	V_{DS}=750V,V_{GS}=0V T_C=25°C T_C=175°C
Gate-source leakage current	I_{GSS}	-		100	nA	V_{GS}=18V,V_{DS}=0V
Drain-source on-state resistance	$R_{DS(on)}$	- -	11 16	13 -	mΩ	V_{GS}=18V, I_D=80A, T_J=25°C T_J=175°C
Drain-source on-state resistance	$R_{DS(on)}$	- -	14 18	18 -	mΩ	V_{GS}=15V, I_D=80A, T_J=25°C T_J=175°C
Dynamic Characteristic						
Input Capacitance	C_{iss}	-	4877.6	-	pF	V_{DS} = 600V V_{GS} = 0V T_J = 25°C V_{AC}=25mV f = 1MHz
Output Capacitance	C_{oss}	-	303	-		
Reverse Transfer Capacitance	C_{rss}	-	19.6	-		
Gate Total Charge	Q_G	-	157	-	nC	V_{DS} = 600V V_{GS} = 0/+18V I_D = 80A I_G=10mA
Gate-Source charge	Q_{gs}	-	21.6	-		
Gate-Drain charge	Q_{gd}	-	25.6	-		
Turn-On Switching Energy	E_{ON}	-	545	-	uJ	V_{DD} = 600V V_{GS} = -4/+18V I_D = 80A R_G = 5Ω L = 100uH T_J = 25°C
Turn-Off Switching Energy	E_{OFF}	-	539.7	-		
Turn-on delay time	$t_{d(on)}$	-	21	-	ns	
Rise time	t_r	-	15.6	-		
Turn-off delay time	$t_{d(off)}$	-	60.2	-		
Fall time	t_f	-	22	-		
Gate resistance	R_G	-	2.2	-	Ω	V_{AC} = 25mV, f=1MHz

Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	V_{SD}		4.2		V	V_{GS}=-4V,I_{SD}=40A, T_J=25°C
			3.8			V_{GS}=-4V,I_{SD}=40A, T_J=175°C
Reverse Recovery Time	t_{rr}	-	28.6	-	ns	V_R = 600V I_D = 80A di/dt = 1000A/μS V_{GS}= -4V T_J = 25°C
Reverse Recovery Charge	Q_{rr}	-	260	-	nC	
Reverse Recovery Energy	E_{REC}	-	20	-	uJ	
Peak Reverse Recovery Current	I_{rrm}	-	16	-	A	
Charge Time	t_A	-	18.4	-	ns	
DisCharge Time	t_B	-	10.6	-	ns	
Reverse Recovery Time	t_{rr}	-	38	-	ns	V_R = 600V I_D = 80A di/dt = 1000A/μS V_{GS}= -4V T_J = 175°C
Reverse Recovery Charge	Q_{rr}	-	450	-	nC	
Reverse Recovery Energy	E_{REC}	-	40	-	uJ	
Peak Reverse Recovery Current	I_{rrm}	-	21	-	A	
Charge Time	t_A	-	22	-	ns	
DisCharge Time	t_B	-	16.4	-	ns	

Typical Performance Characteristics

Fig 1. Output Characteristic (T_J=-55℃)

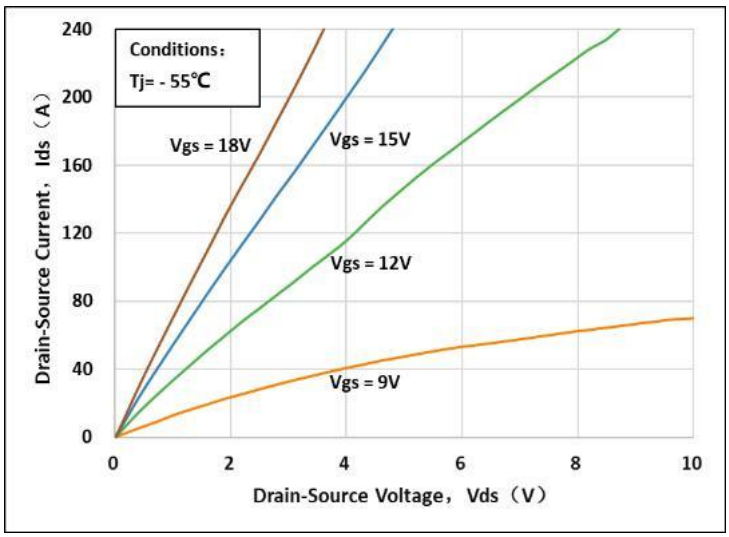


Fig 2. Output Characteristic (T_J=25℃)

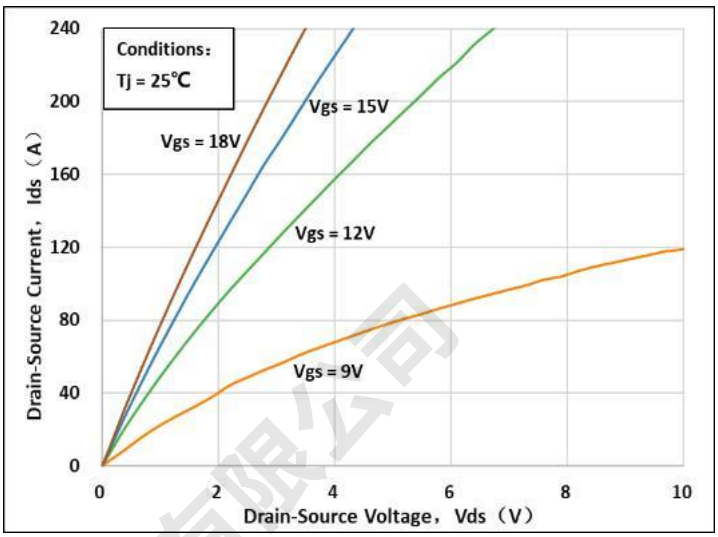


Fig 3. Output Characteristic (T_J=175℃)

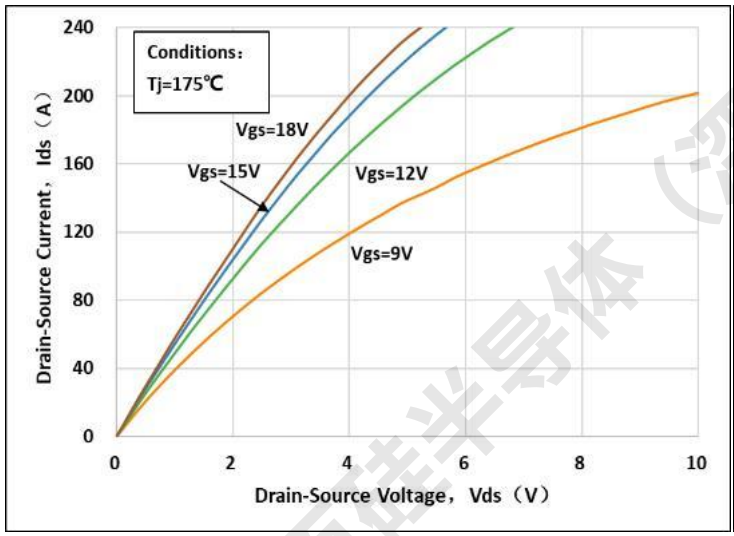


Fig 4: Rdson Vs Ids Characteristic

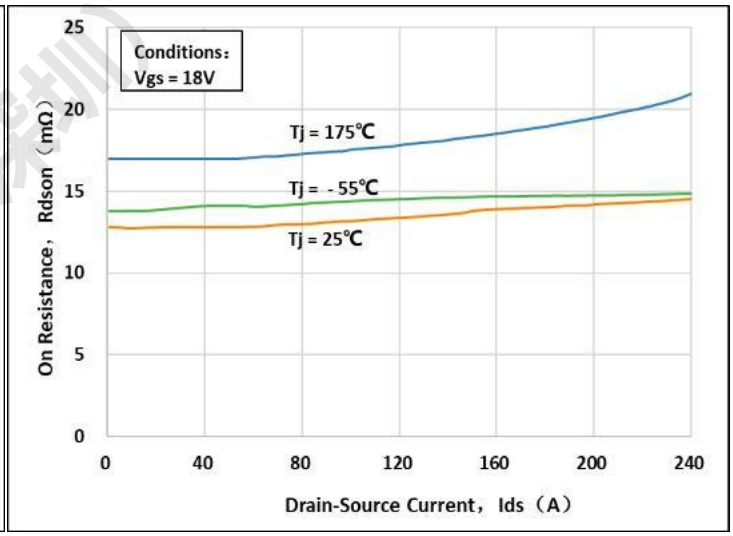


Fig 5: Rds(on) vs. Temperature

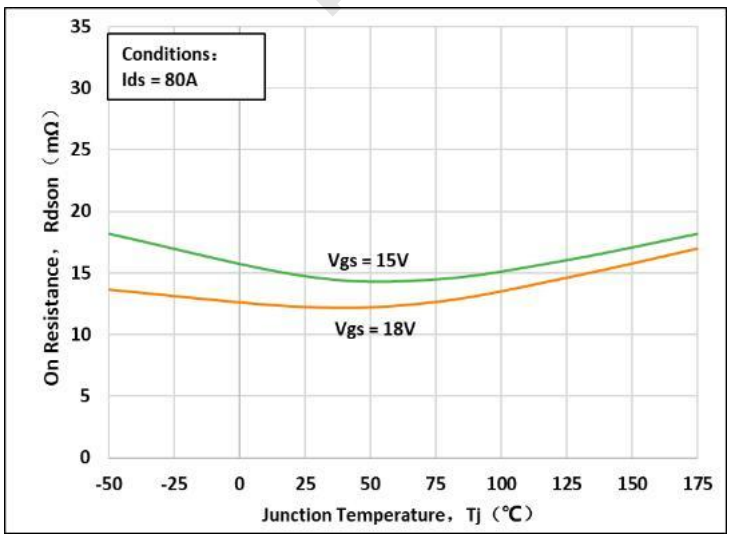


Fig 6: Transfer Characteristic

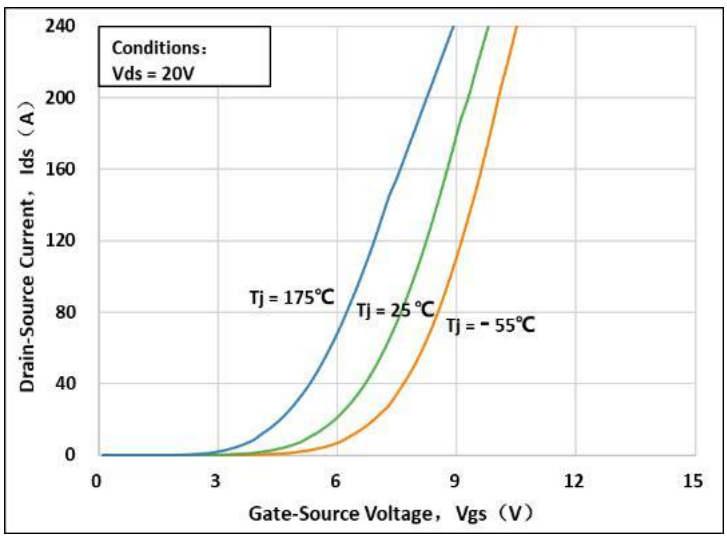


Fig 7: Body-diode Characteristic (T_J=-55℃)

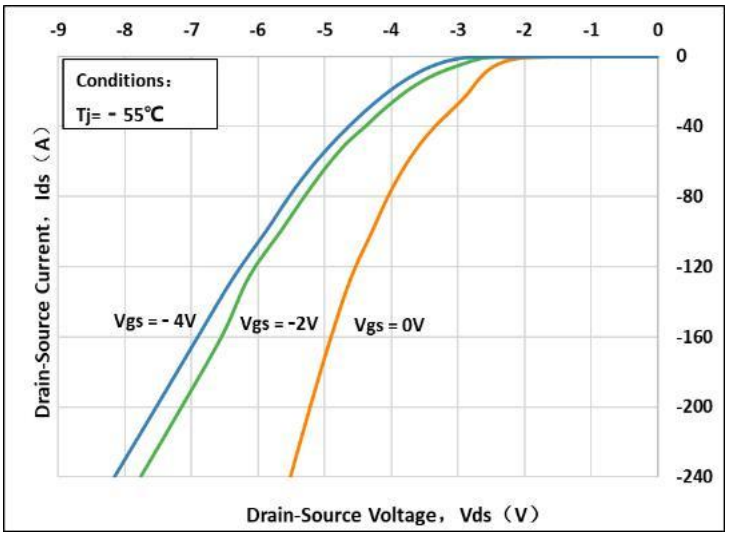


Fig 8: Body-diode Characteristic (T_J=25℃)

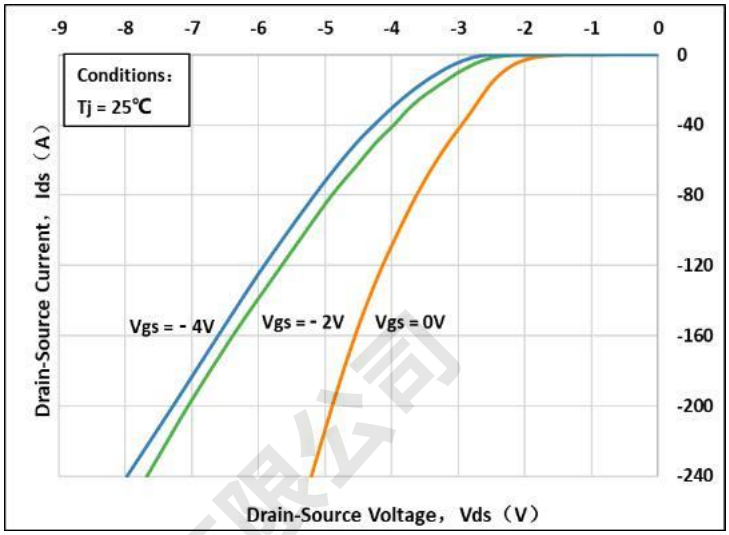


Fig 9: Body-diode Characteristic (T_J=175℃)

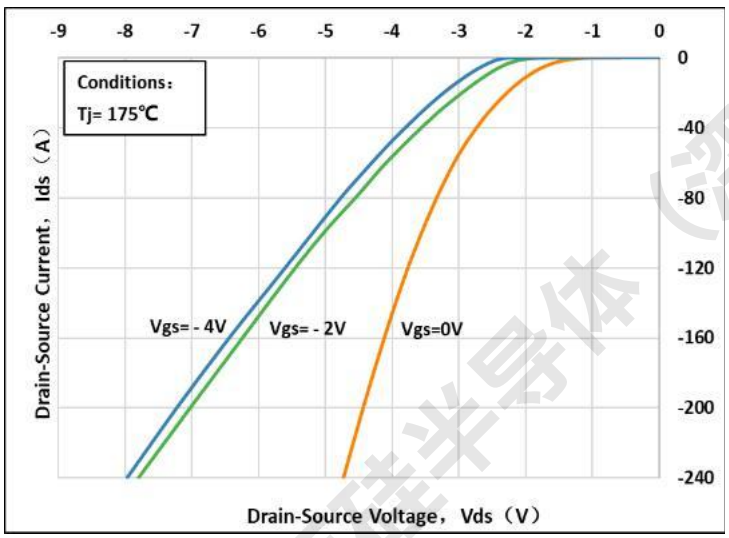


Fig 10: V_{TH} Vs T_J Temperature Characteristic

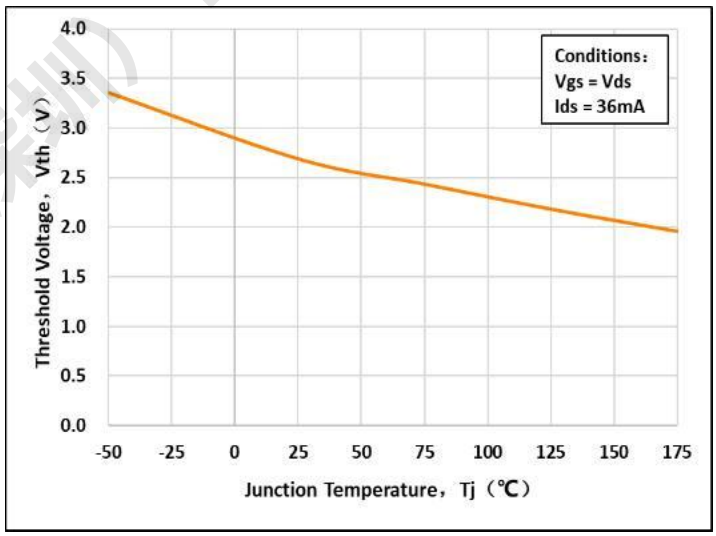


Fig 11: 3rd Quadrant Characteristic(T_J=-55℃)

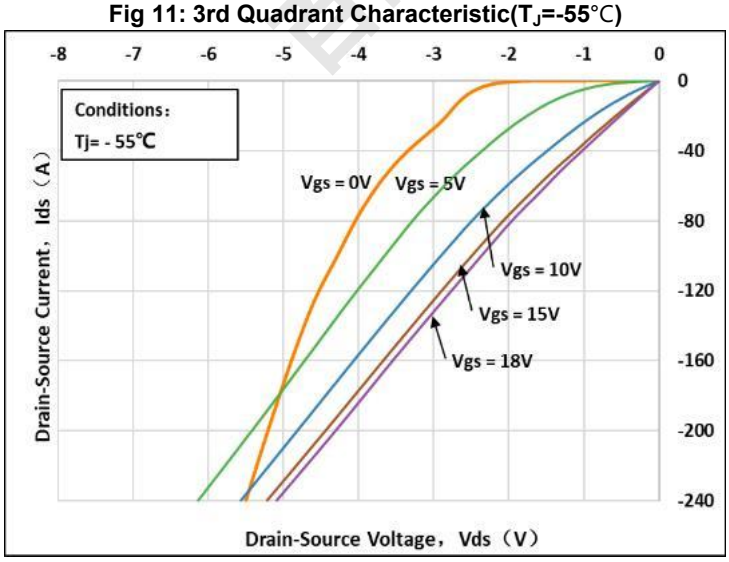


Fig 12: 3rd Quadrant Characteristic(T_J=25℃)

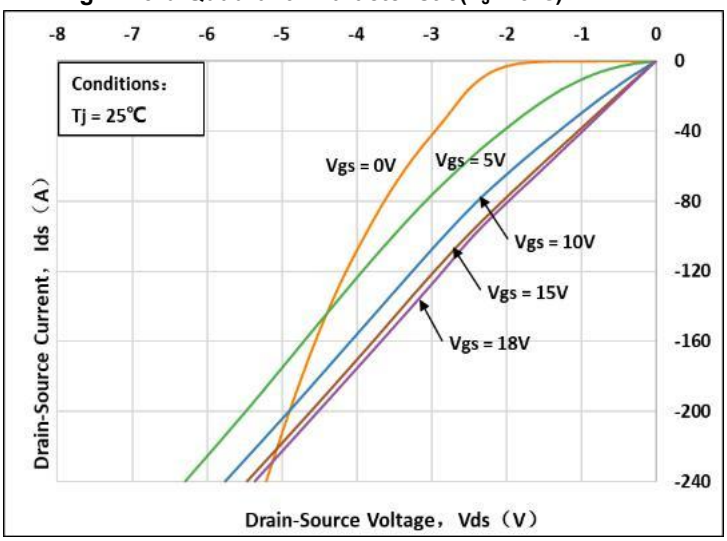


Fig 13: 3rd Quadrant Characteristic(T_J=175℃)

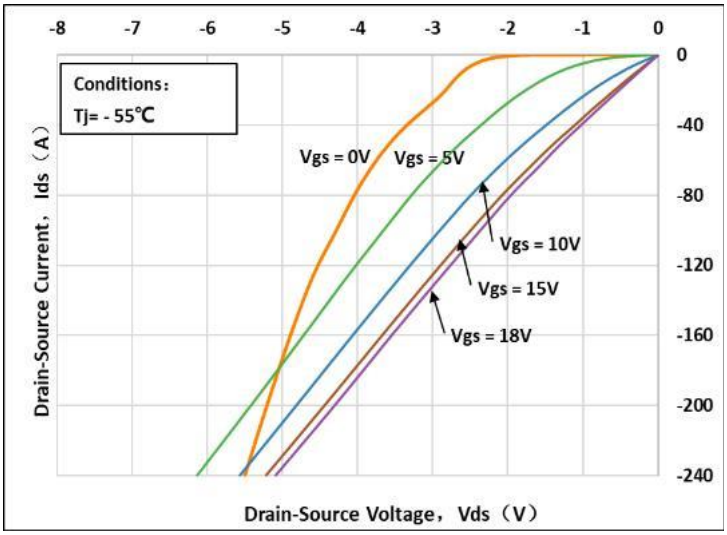


Fig 14: Gate Charge Characteristics

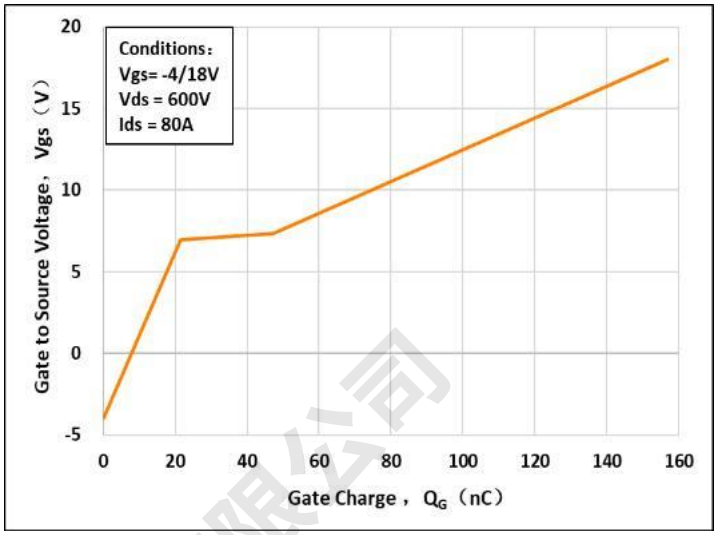


Fig 15: Drain Current vs.Case Temperature

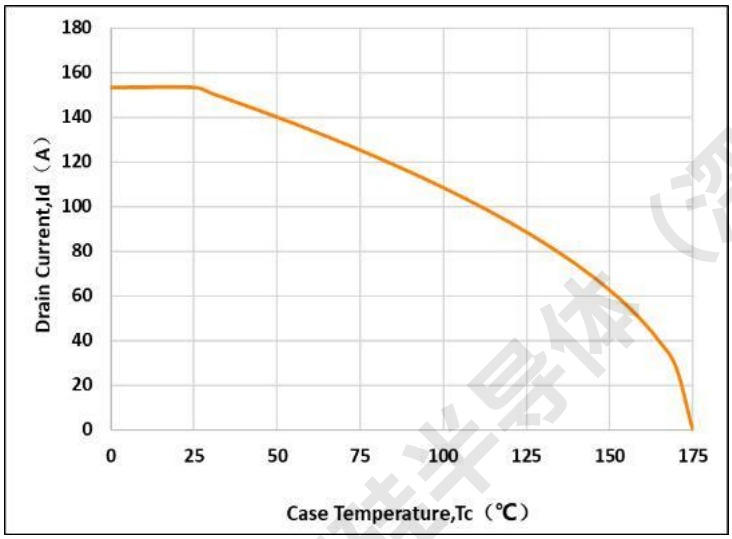


Fig 16: Safe Operating Area

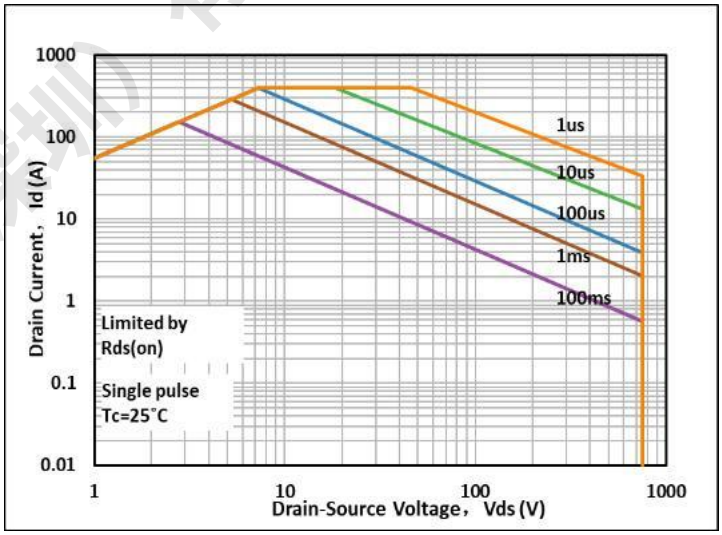


Fig 17: Capacitance Characteristics

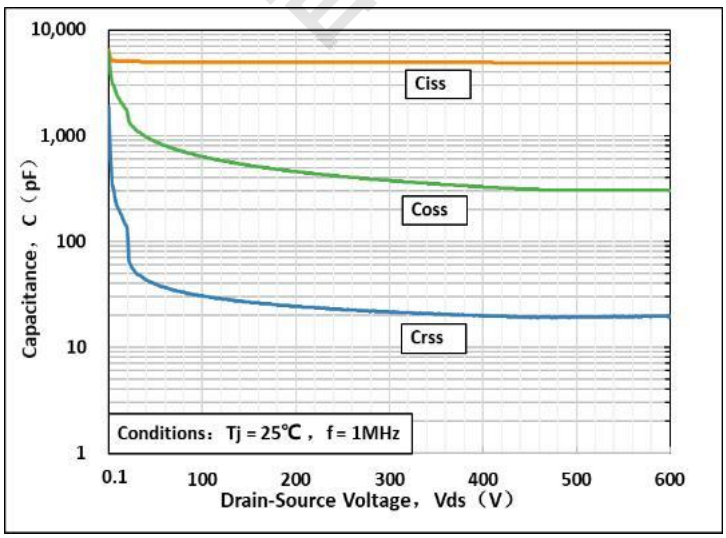
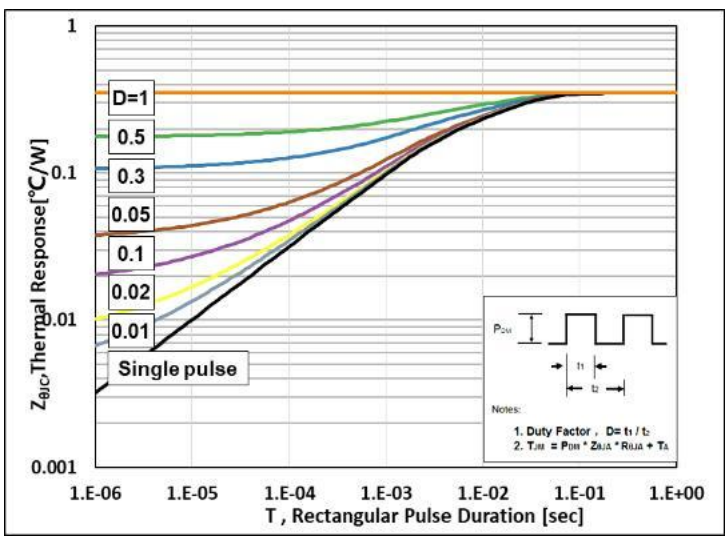
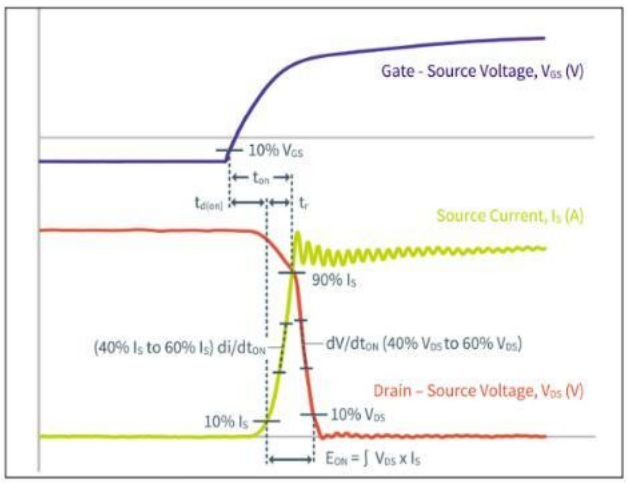


Fig 18: Transient Thermal Impedance

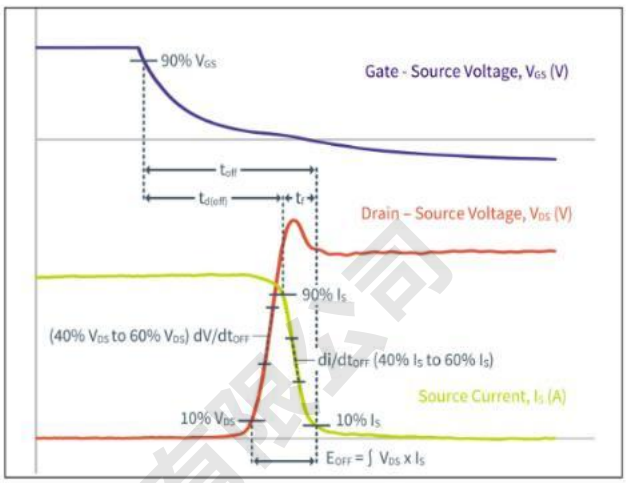


Test Circuit & Waveform

Figure A. Definition of switching times



Turn-on Transient Definitions



Turn-off Transient Definitions

Figure B. Dynamic test circuit

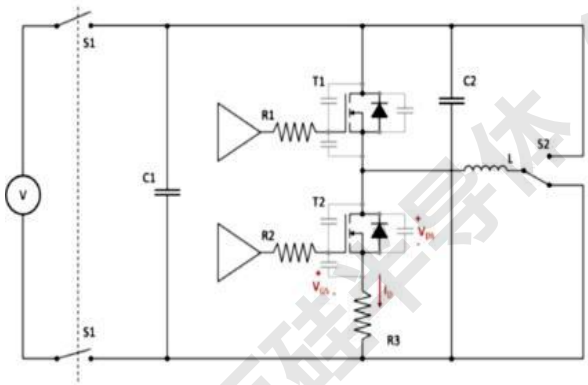
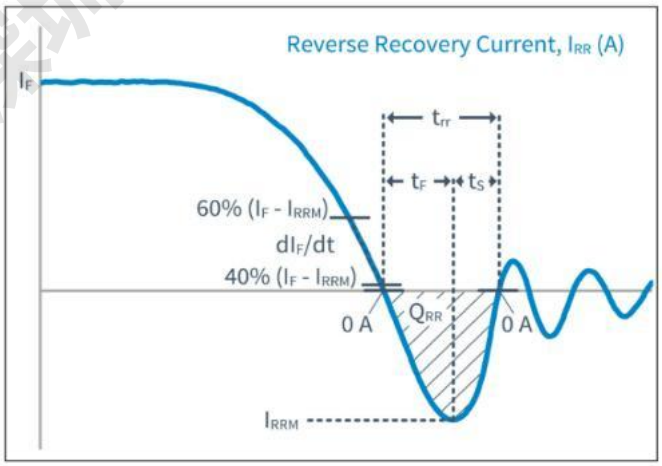
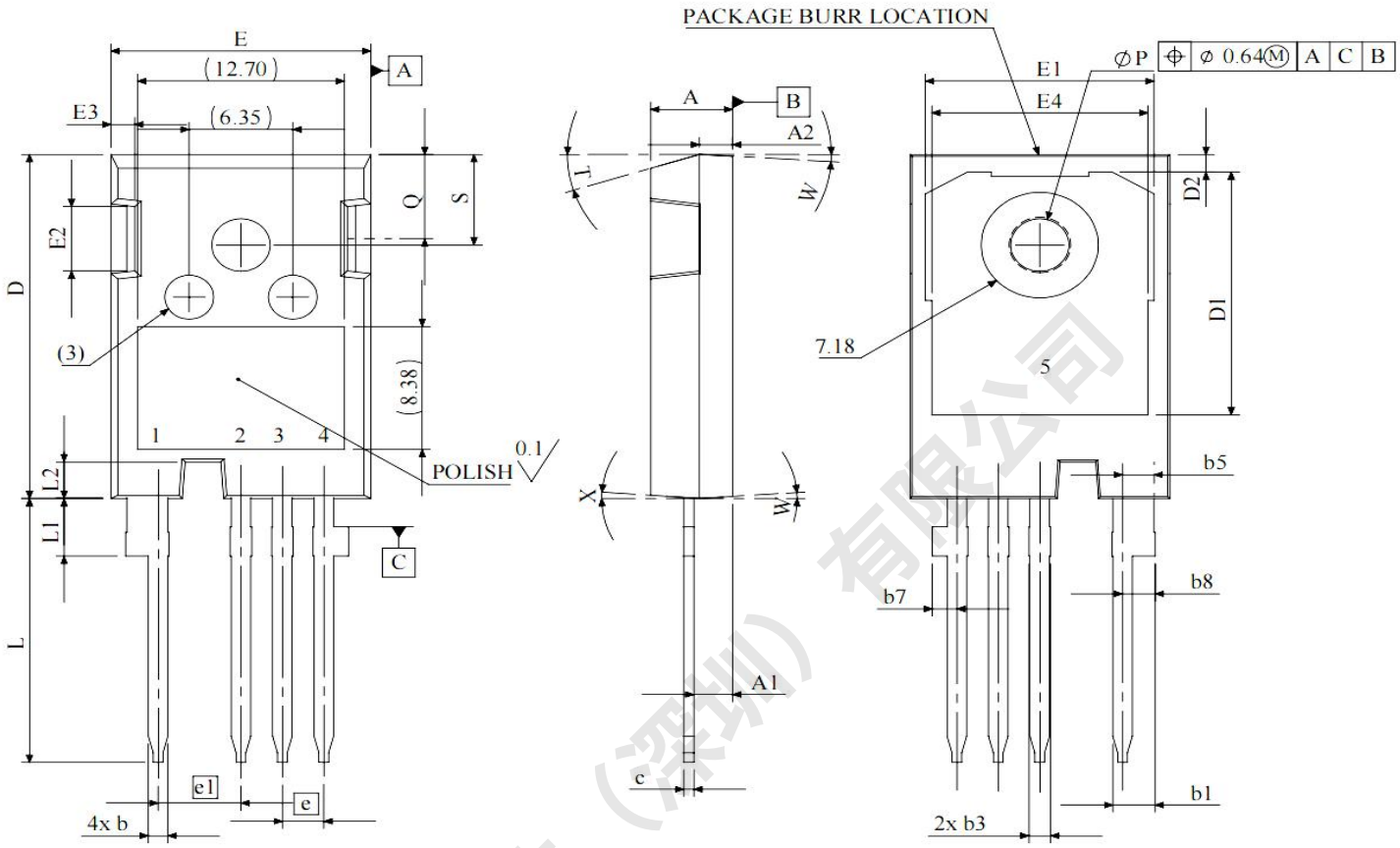


Figure C. Definition of body diodeswitching characteristics



Reverse Recovery Definitions

Package Dimensions: TO-247-4L

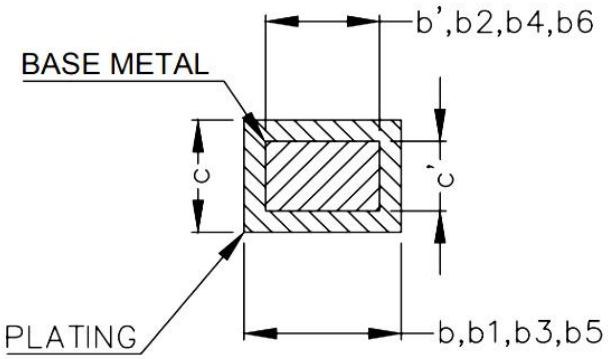


⌖ 0.25Ⓜ B AⓂ

SYMBOL	MIN (mm)	MAX (mm)
A	4.83	5.21
A1	2.29	2.54
A2	1.91	2.16
b	1.07	1.33
b1	2.39	2.94
b3	1.07	1.60
b5	2.39	2.69
b7	1.30	1.70
b8	1.80	2.20
c	0.55	0.68
D	23.30	23.60
D1	16.25	17.65
D2	0.95	1.25
E	15.75	16.13
E1	13.1	14.15
E2	3.68	5.10
E3	1.00	1.90
E4	12.38	13.43
e	2.54 BSC	
e1	5.08 BSC	
L	17.31	17.82
L1	3.97	4.37
L2	2.35	2.65
ØP	3.51	3.65
Q	5.49	6.00
S	6.04	6.30
T	17.5° REF.	
W	3.5° REF.	
X	4° REF.	

1	DRAIN
2	SOURCE
3	DRIVER SOURCE
4	GATE
5	DRAIN

NOTE:
1. ALL METAL SURFACES ARE TIN PLATED (MATTE), EXCEPT AREA OF CUT.
2. DIMENSIONING & TOLERANCING CONFORM TO ASME Y14.5M-1994.
3. ALL DIMENSIONS ARE LISTED IN MILLIMETERS. ANGLES ARE IN DEGREES.
4. BURR OR MOLD FLASH SIZE (0.5 mm) IS NOT INCLUDED IN THE DIMENSIONS



SECTION "F-F", "G-G" AND "H-H"
SCALE: NONE

Recommended Solder Pad Layout