

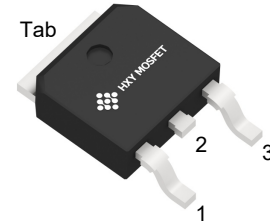


Features

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

Applications

- Solar Inverters
- Switch Mode Power Supplies
- UPS
- Battery Chargers

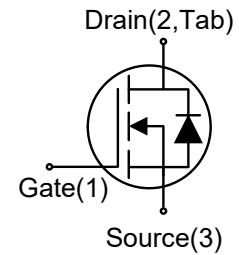


TO-252-2L



Package Marking and Ordering Information

Ordering Part Number	Package	Brand
IPD80R280P7ATMA1	TO-252-2L	HXY MOSFET



Absolute Maximum Ratings

Symbol	Parameter	Value	Unit	Test Conditions
V_{DSmax}	Drain - Source Voltage	800	V	
V_{GSmax}	Gate - Source Voltage (Absolute maximum values)	-8/+22	V	
V_{GS}	Gate - Source Voltage	-4/+18	V	
I_D	Continuous Drain Current	14.3	A	$T_C = 25^{\circ}C$
		8.2		$T_C = 100^{\circ}C$
$I_{D(pulse)}$	Pulsed Drain Current	25	A	Pulse width t_p limited by T_{jmax}
P_{TOT}	Power Dissipation	71	W	$T_C = 25^{\circ}C$
T_J, T_{stg}	Operating Junction and Storage Temperature	-55 to +175	$^{\circ}C$	

•Example of acceptable V_{GS} waveform





Electrical Characteristics ($T_C = 25^\circ\text{C}$ unless other wise specified)

Symbol	Parameter	Value			Unit	Test Condition
		min.	typ.	max.		
Static Characteristics						
V _{DSS}	Drain-source breakdown voltage	800	-	-	V	V _{GS} =0V, I _D =100uA
V _{GS(th)}	Gate threshold voltage	2	3	4	V	V _{DS} =V _{GS} ,I _D =0.43mA
I _{DSS}	Zero gate voltage drain current	- -	1 5	5 -	μA	V _{DS} =800V,V _{GS} =0V T _C =25°C T _C =175°C
I _{GSS}	Gate-source leakage current	-		100	nA	V _{GS} =18V,V _{DS} =0V
R _{DS(on)}	Drain-source on-state resistance	-	230 276	269	mΩ	V _{GS} =18V, I _D =3.6A, T _J =25°C T _J =175°C
R _{DS(on)}	Drain-source on-state resistance	- -	295 350	360 -	mΩ	V _{GS} =15V, I _D =3.6A, T _J =25°C T _J =175°C
Dynamic Characteristics						
C _{iss}	Input Capacitance	-	287.9	-	pF	V _{DS} = 600V V _{GS} = 0V T _J = 25°C V _{AC} = 25mV f = 1MHz
C _{oss}	Output Capacitance	-	21.84	-		
C _{rss}	Reverse Transfer Capacitance	-	2.31	-		
Q _G	Gate Total Charge	-	14.1	-	nC	V _{DS} = 600V V _{GS} = -4/18V I _D = 3.6A
Q _{gs}	Gate-Source charge	-	2.78	-		
Q _{gd}	Gate-Drain charge	-	8.97	-		
E _{ON}	Turn-On Switching Energy	-	42.5	-	μJ	V _{DD} = 600V V _{GS} = -4/+18V I _D = 3.6A R _G = 5Ω L = 1 mH T _J =25°C
E _{OFF}	Turn-Off Switching Energy	-	7.1	-		
t _{d(on)}	Turn-on delay time	-	4.3	-	ns	
t _r	Rise time	-	9	-		
t _{d(off)}	Turn-off delay time	-	8.6	-		
t _f	Fall time	-	30.6	-		
R _G	Gate resistance	-	3.8	-	Ω	V _{AC} = 25mV, f=1MHz



Body Diode Characteristics

V_{SD}	Body Diode Forward Voltage		3		V	$V_{GS} = -4V, I_{SD} = 1.8A,$ $T_J = 25^\circ C$
			2.7			$V_{GS} = -4V, I_{SD} = 1.8A,$ $T_J = 175^\circ C$
t_{rr}	Body Diode Reverse Recovery Time	-	52	-	ns	$V_R = 600V, V_{GS} = -4V$ $I_D = 3.6A$ $di/dt = 1000A/\mu s$ $T_J = 25^\circ C$
Q_{rr}	Body Diode Reverse Recovery Charge	-	21.8	-	nC	
E_{REC}	Reverse Recovery Energy	-	0.45	-	μJ	
I_{rrm}	Peak Reverse Recovery Current	-	2.46	-	A	
t_A	Charge Time	-	13.3	-	ns	
t_B	DisCharge Time	-	2.6	-	ns	

Thermal Characteristics

Symbol	Parameter	Typ.	Unit	Test Conditions
R_{thJC}	Thermal Resistance from Junction to Case	2.1	$^\circ C/W$	
R_{thJA}	Thermal Resistance From Junction to Ambient	40		



Typical Performance

Fig 1. Output Characteristic ($T_J = -55^\circ\text{C}$)

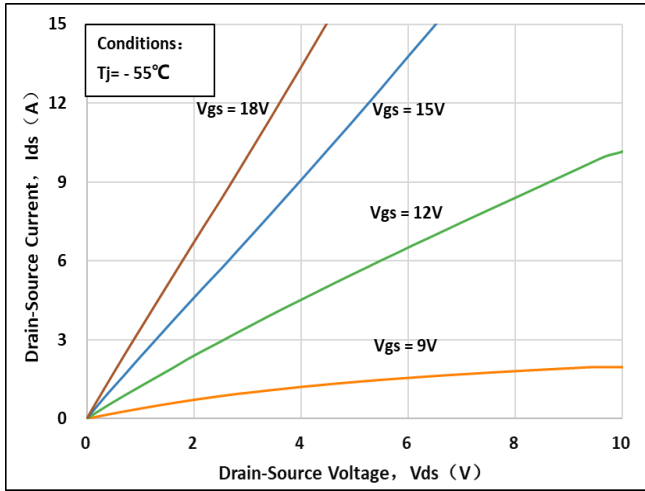


Fig 2. Output Characteristic ($T_J = 25^\circ\text{C}$)

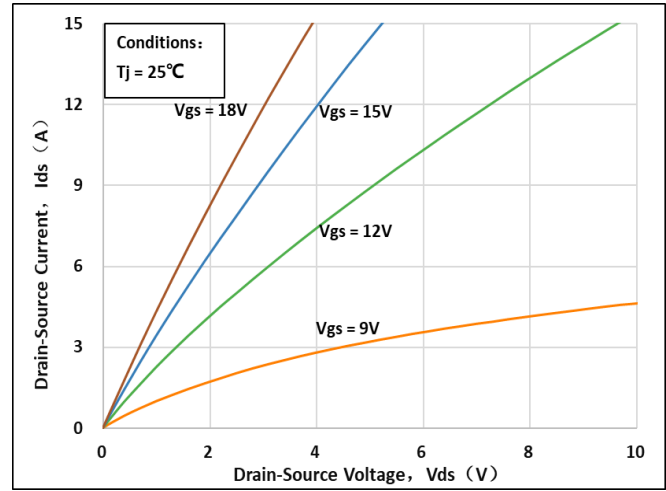


Fig 3. Output Characteristic ($T_J = 175^\circ\text{C}$)

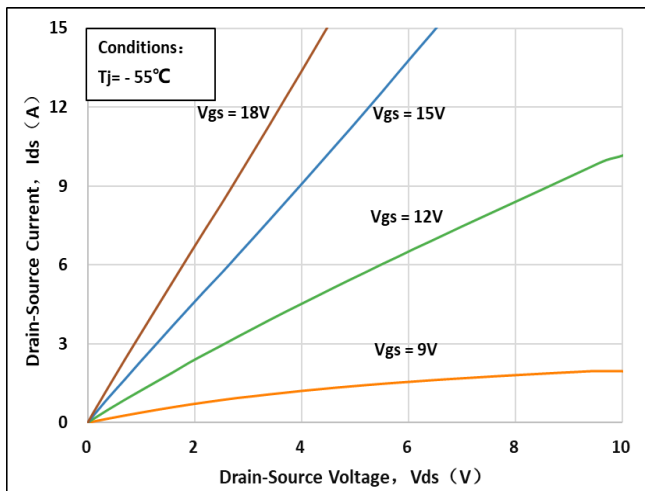


Fig 4: $R_{DS(on)}$ Vs I_{DS} Characteristic

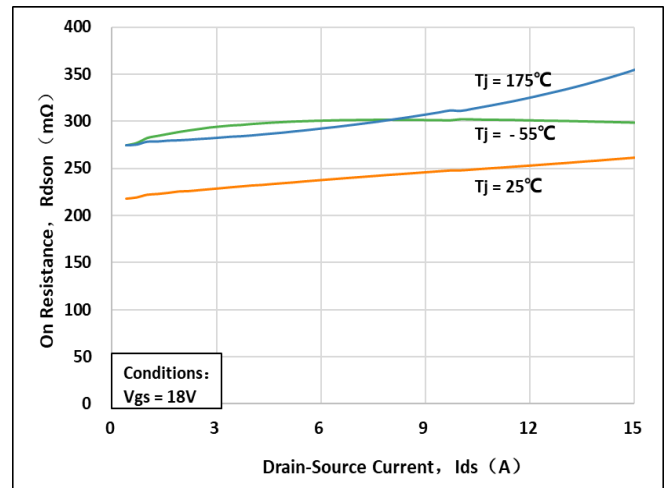


Fig 5: $R_{DS(on)}$ vs. Temperature

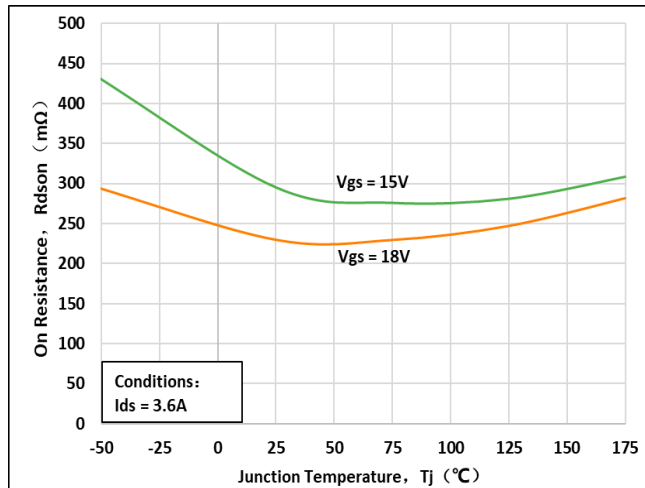


Fig 6: Transfer Characteristic

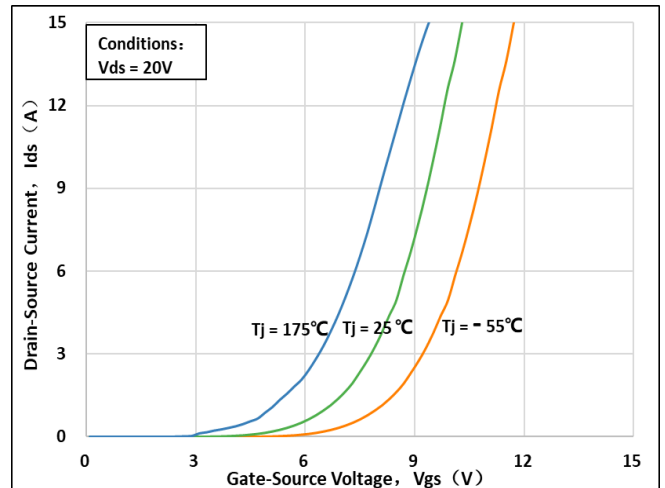




Fig 7: Body-diode Characteristic ($T_J = -55^\circ\text{C}$)

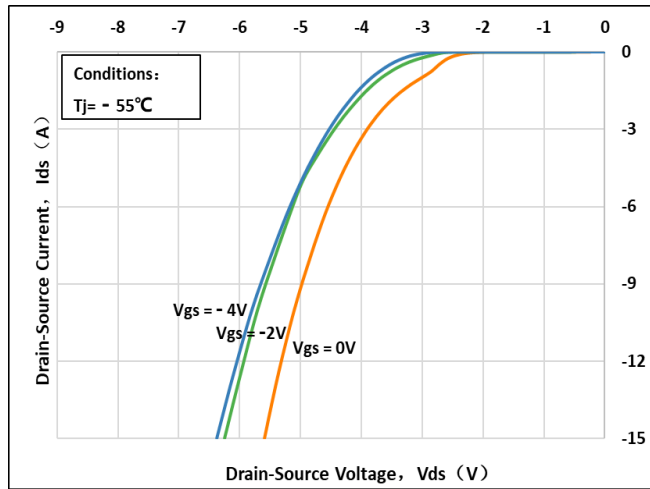


Fig 8: Body-diode Characteristic ($T_J = 25^\circ\text{C}$)

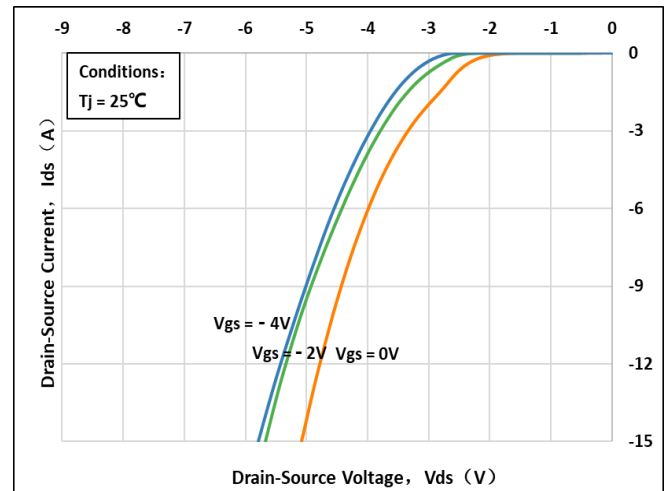


Fig 9: Body-diode Characteristic ($T_J = 175^\circ\text{C}$)

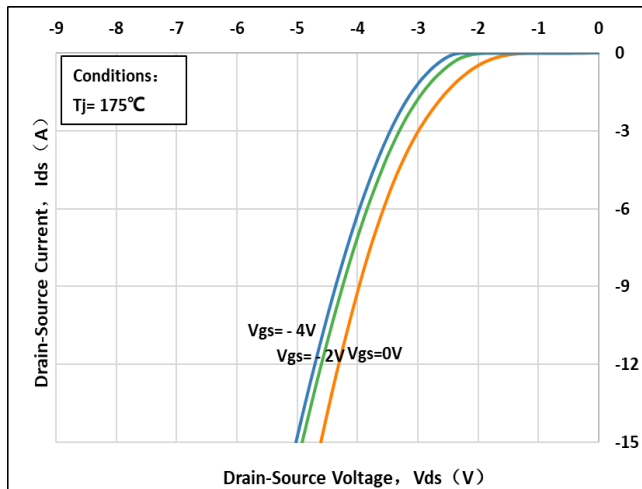


Fig 10: V_{TH} Vs T_J Temperature Characteristic

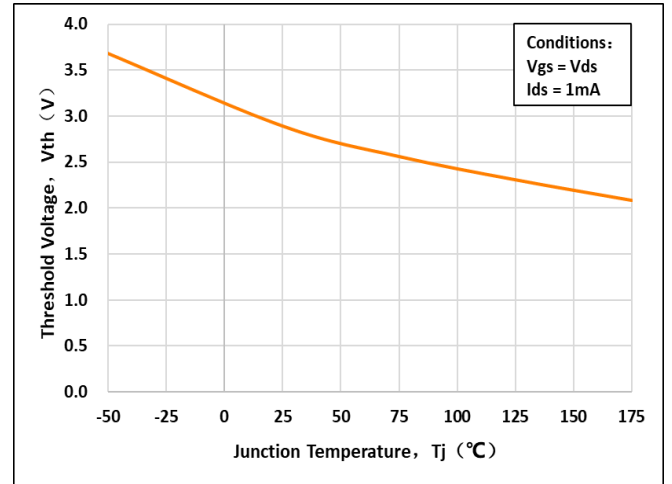


Fig 11: 3rd Quadrant Characteristic ($T_J = -55^\circ\text{C}$)

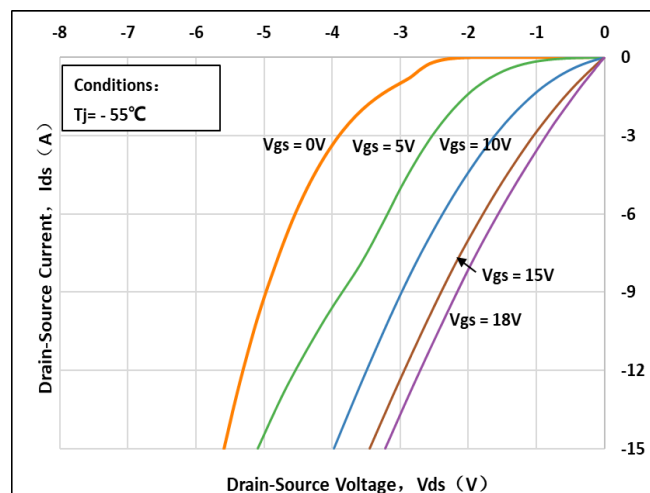


Fig 12: 3rd Quadrant Characteristic ($T_J = 25^\circ\text{C}$)

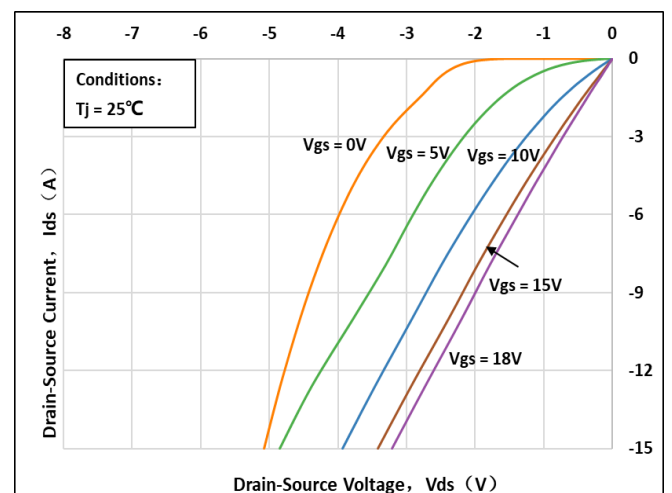




Fig 13: 3rd Quadrant Characteristic($T_J=175^{\circ}\text{C}$)

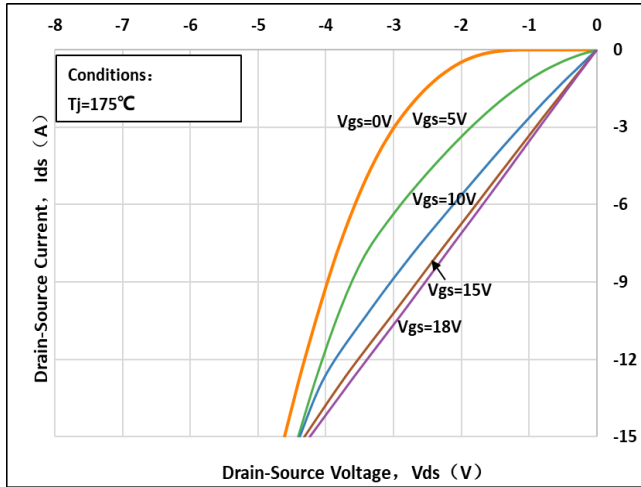


Fig 14: Gate Charge Characteristics

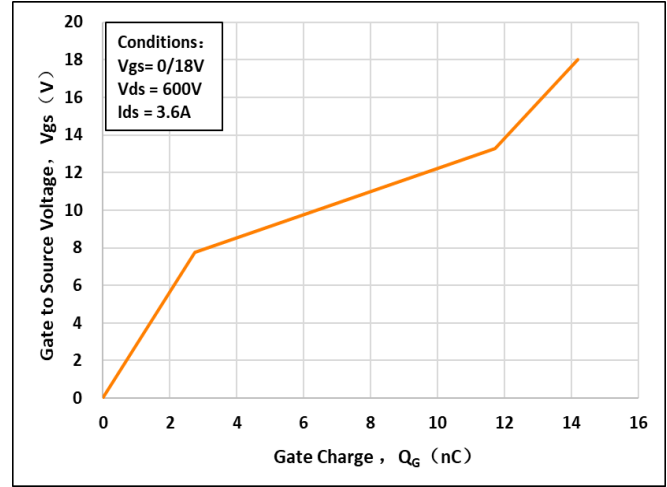


Fig 15: Drain Current vs. Case Temperature

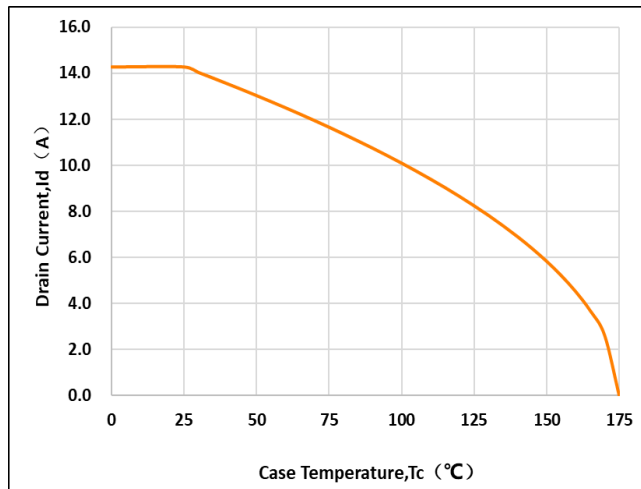


Fig 16: Safe Operating Area

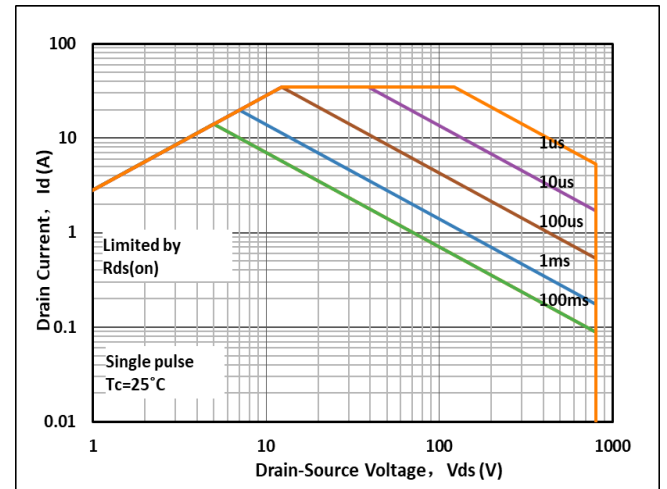


Fig 17: Capacitance Characteristics

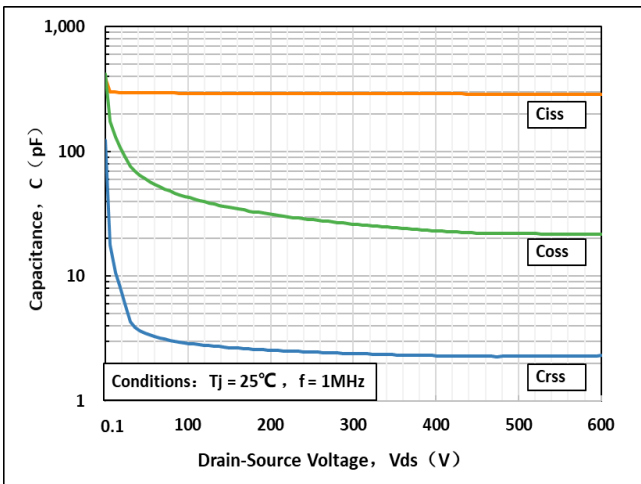
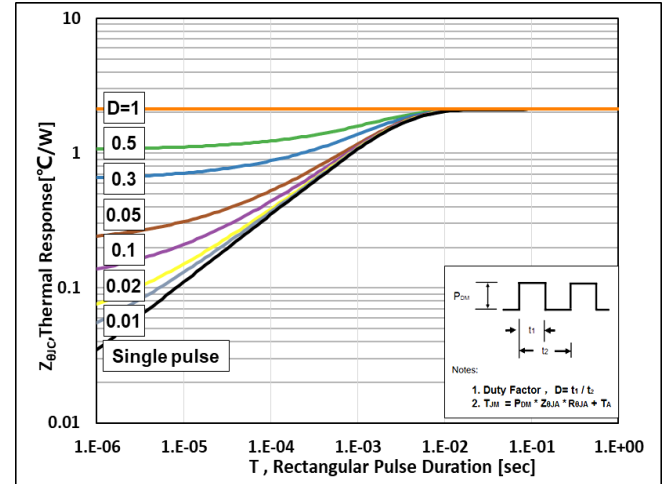


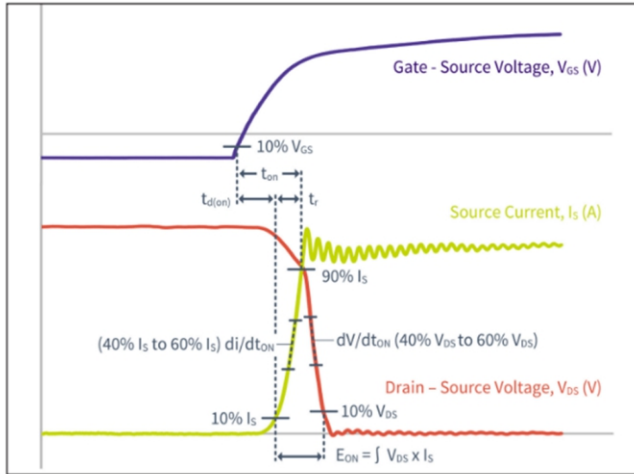
Fig 18: Transient Thermal Impedance



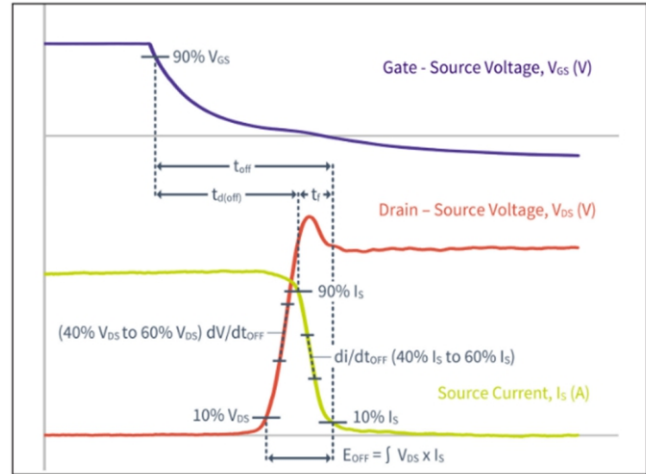


Test Circuit & Waveform

Figure A. Definition of switching times



Turn-on Transient Definitions



Turn-off Transient Definitions

Figure B. Dynamic test circuit

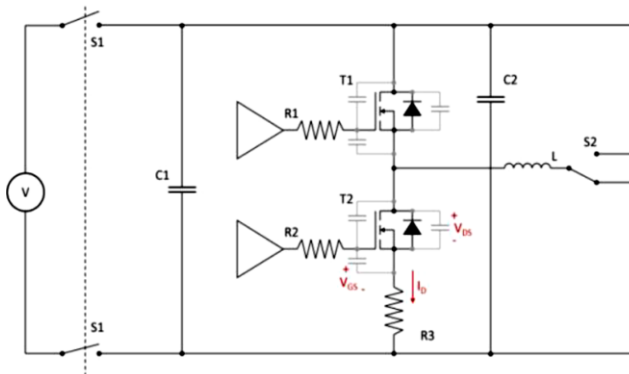
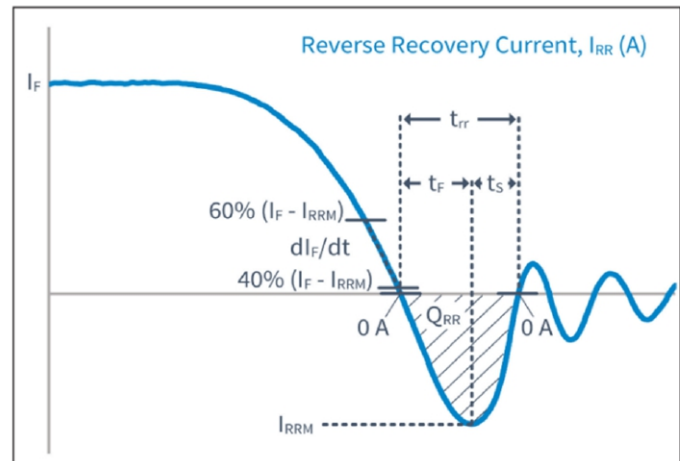


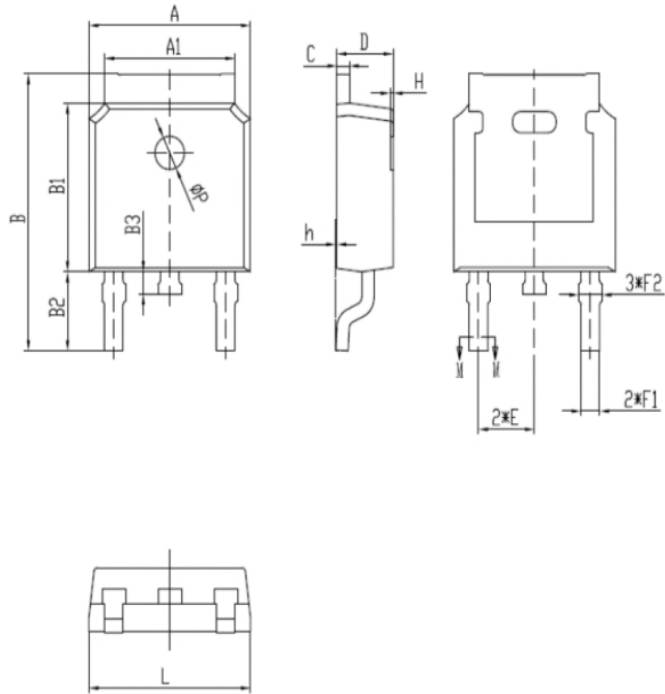
Figure C. Definition of body diodeswitching characteristics



Reverse Recovery Definitions



Package Dimensions
Package TO-252-2L



项目	规范(mm)	
	MIN	MAX
A	6.50	6.70
A1	5.16	5.46
B	9.77	10.17
B1	6.00	6.20
B2	2.60	3.00
B3	0.70	0.90
C	0.45	0.61
D	2.20	2.40
E	2.186	2.386
F1	0.67	0.87
F2	0.76	0.96
H	0.00	0.30
h	0.00	0.127
L	6.50	6.70
φ P	1.10	1.30



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