Description

JMT N And P-Channel Enhancement Mode MOSFET

Features

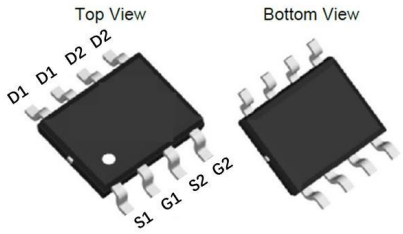
- N-Channel: 30V, 10A
  $R_{DS(ON)}$ < 13mΩ @ V_{GS} = 10V
  $R_{DS(ON)}$ < 20mΩ @ V_{GS} = 4.5V
- P-Channel: -30V, -12A
  $R_{DS(ON)}$ < 25mΩ @ V_{GS} = -10V
  $R_{DS(ON)}$ < 35mΩ @ V_{GS} = -4.5V
- Excellent Gate Charge x $R_{DS(ON)}$ Product(FOM)
- Very Low On-resistance $R_{DS(ON)}$
- Fast Switching Speed

Application

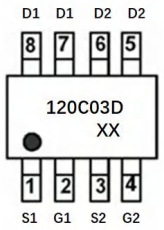
- Battery Protection
- Load Switch
- Power Management

RoHS

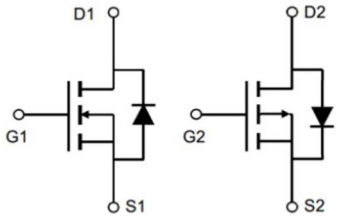
100% UIS TESTED!
100% ΔVds TESTED!



SOP-8(Dual)



Marking and pin Assignment



Schematic Diagram

Package Marking and Ordering Information

Device Marking	Device	OUTLINE	Device Package	Reel Size	Reel (PCS)	Per Carton (PCS)
120C03D	JMTP120C03D	TAPING	SOP-8	13inch	4000	48000

Absolute Maximum Ratings (T_A=25℃ unless otherwise specified)

Symbol	Parameter		Max. N-Channel	Max. P-Channel	Units
V_{DSS}	Drain-Source Voltage		30	-30	V
V_{GSS}	Gate-Source Voltage		±20	±20	V
I_D	Continuous Drain Current	T_A= 25℃	10	-12	A
		T_A= 100℃	6.5	-7.8	A
I_{DM}	Pulsed Drain Current note1		40	-48	A
E_{AS}	Single Pulsed Avalanche Energy note2		17	24	mJ
P_D	Power Dissipation	T_A= 25℃	2.2	6.1	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient		57	20	℃/W
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +150		℃

N-Channel Electrical Characteristics (T_J=25℃ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=30V, V_{GS}=0V	-	-	1.0	μA
I_{GSS}	Gate to Body Leakage Current	V_{DS}=0V, V_{GS}=±20V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	1.0	1.4	2.5	V
$R_{DS(on)}$	Static Drain-Source on-Resistance note3	V_{GS}=10V, I_D=10A	-	10	13	mΩ
		V_{GS}=4.5V, I_D=5A	-	15	20	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=15V, V_{GS}=0V, f=1.0MHz	-	584	-	pF
C_{oss}	Output Capacitance		-	112	-	pF
C_{rss}	Reverse Transfer Capacitance		-	96	-	pF
Q_g	Total Gate Charge	V_{DS}=15V, I_D=10A, V_{GS}=10V	-	15	-	nC
Q_{gs}	Gate-Source Charge		-	4.7	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	3.6	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=30V, I_D= 20A, R_{REN} =3Ω,V_{GS}=10V	-	5	-	ns
t_r	Turn-on Rise Time		-	8	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	21	-	ns
t_f	Turn-off Fall Time		-	7	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	10	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	40	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS}=0V, I_S= 10A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I_F=20A,dI/dt=100A/μs	-	7	-	ns
Qrr	Body Diode Reverse Recovery		-	5.9	-	nC

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition : T_J=25℃,V_{DD}=15V,V_G=10V,L=0.5mH,Rg=25Ω,I_{AS}=8.3A

T_J=25℃,V_{DD}=-15V,V_G= -10V,L=0.5mH,Rg=25Ω,I_{AS}= -9.8A

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%

P-Channel Electrical Characteristics (T_J=25℃ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D= -250μA	-30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}= -30V, V_{GS}=0V	-	-	-1	μA
I_{GSS}	Gate to Body Leakage Current	V_{DS}=0V, V_{GS}=±20V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D= -250μA	-1.0	-1.5	-2.5	V
$R_{DS(on)}$	Static Drain-Source on-Resistance note3	V_{GS}= -10V, I_D= -10A	-	19	25	mΩ
		V_{GS}= -4.5V, I_D= -5A	-	27	35	
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}= -15V, V_{GS}=0V, f=1.0MHz	-	1200	-	pF
C_{oss}	Output Capacitance		-	155	-	pF
C_{rss}	Reverse Transfer Capacitance		-	139	-	pF
Q_g	Total Gate Charge	V_{DS}= -15V, I_D= -8A, V_{GS}= -10V	-	52	-	nC
Q_{gs}	Gate-Source Charge		-	9.8	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	8.3	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}= -15V, I_D= -1A, V_{GS}= -10V, R_{GEN}=6Ω R_D=15Ω	-	13	-	ns
t_r	Turn-on Rise Time		-	15	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	198	-	ns
t_f	Turn-off Fall Time		-	98	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	-12	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-48	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS}=0V, I_S= -12A	-	-	-1.2	V
trr	Reverse Recovery Time	T_J=25℃, I_F=-2A,dI/dt=-100A/μs	-	37	-	ns
Qrr	Reverse Recovery Charge		-	36	-	nC

Typical Performance Characteristics-N

Figure1: Output Characteristics

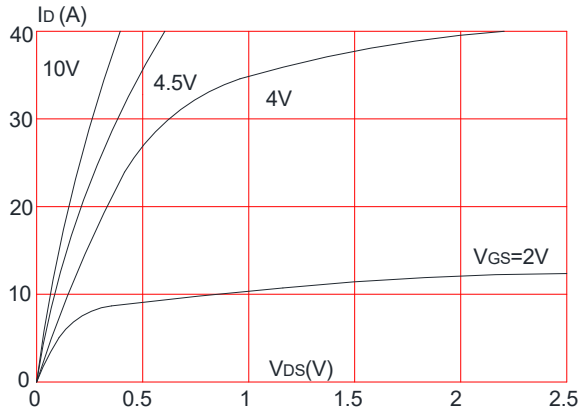


Figure 2: Typical Transfer Characteristics

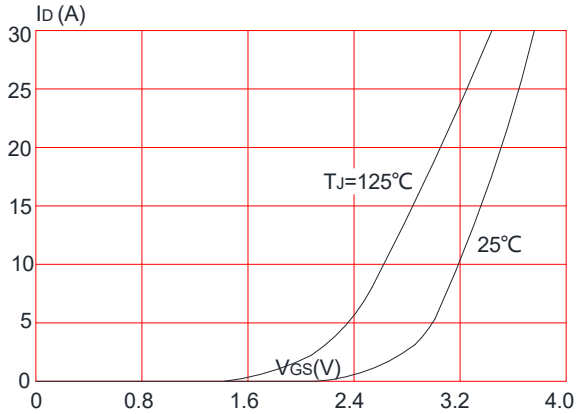


Figure 3: On-resistance vs. Drain Current

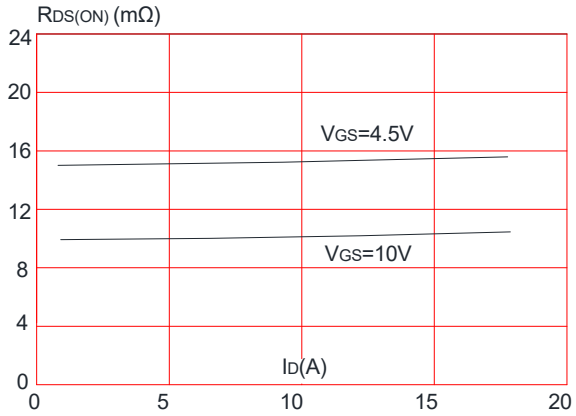


Figure 4: Body Diode Characteristics

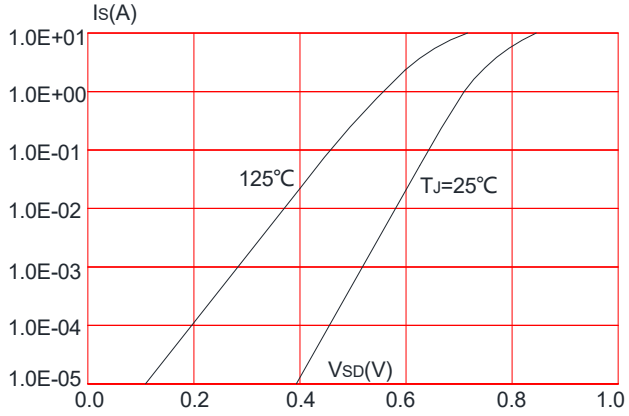


Figure 5: Gate Charge Characteristics

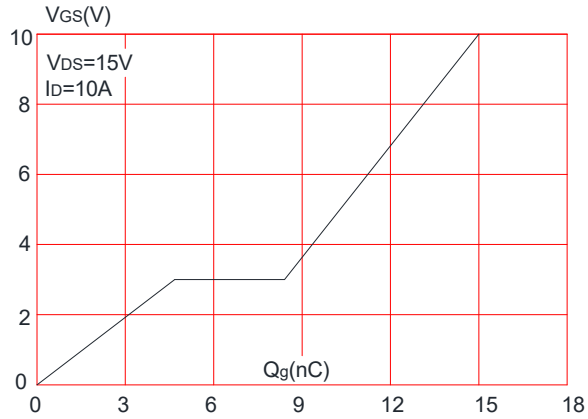


Figure 6: Capacitance Characteristics

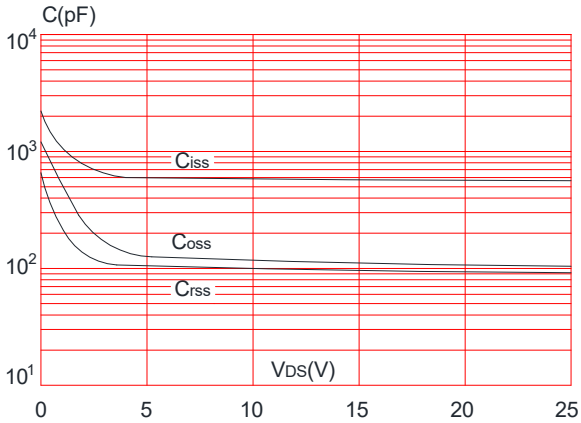


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

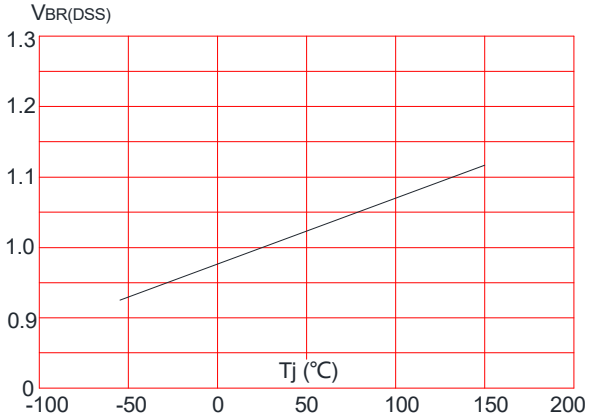


Figure 8: Normalized on Resistance vs. Junction Temperature

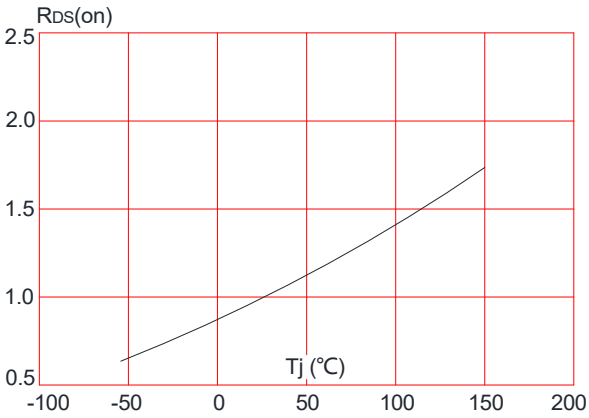


Figure 9: Maximum Safe Operating Area

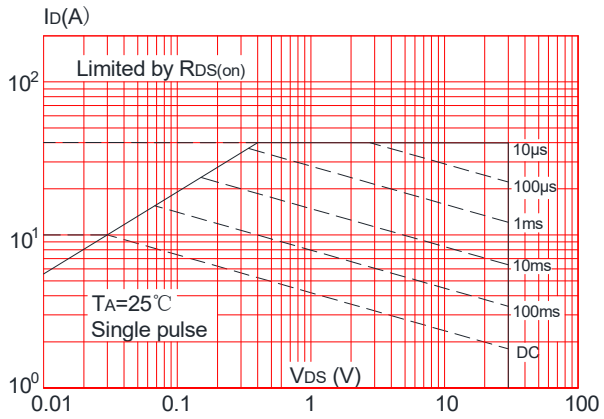


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

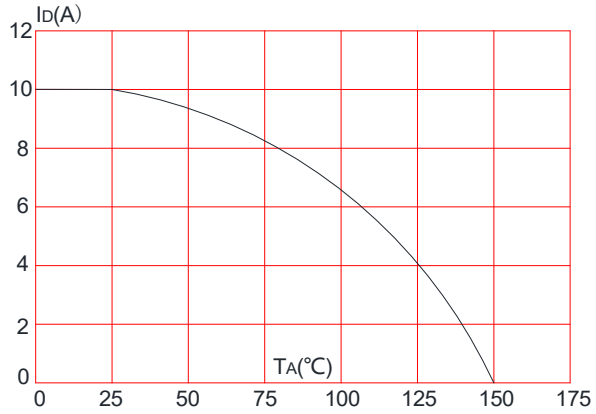
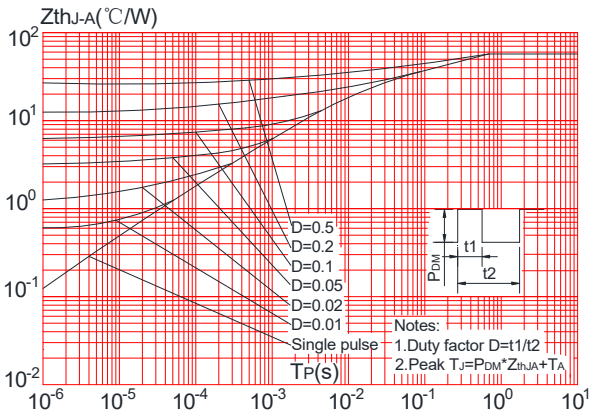


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



Test Circuit-N

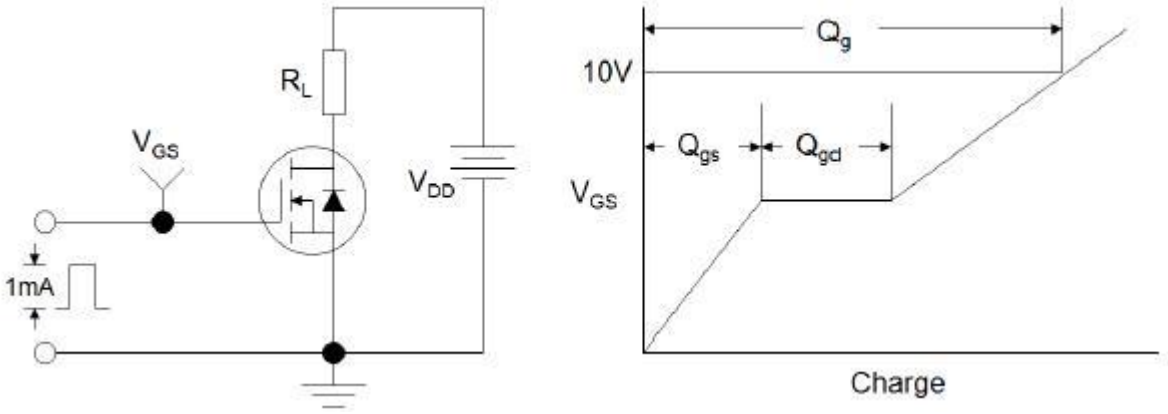


Figure1:Gate Charge Test Circuit & Waveform

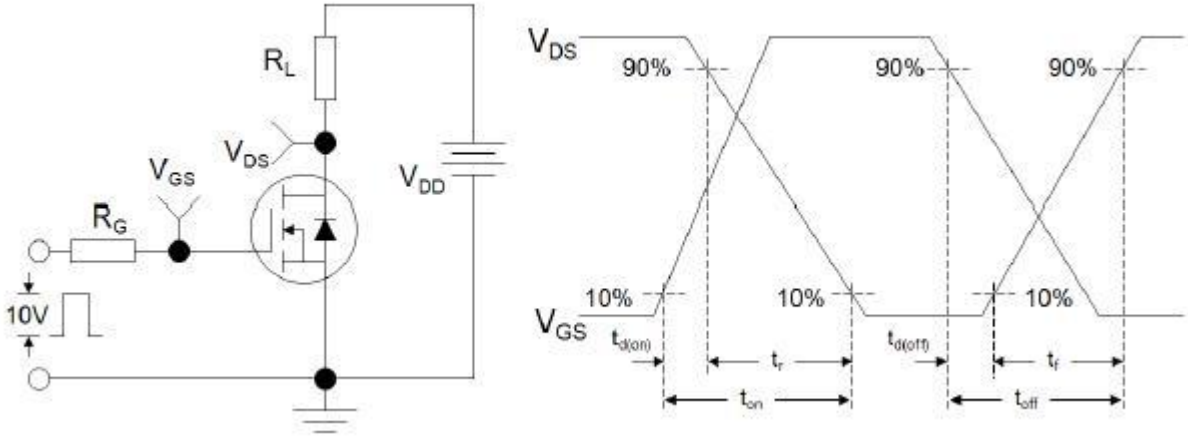


Figure 2: Resistive Switching Test Circuit & Waveforms

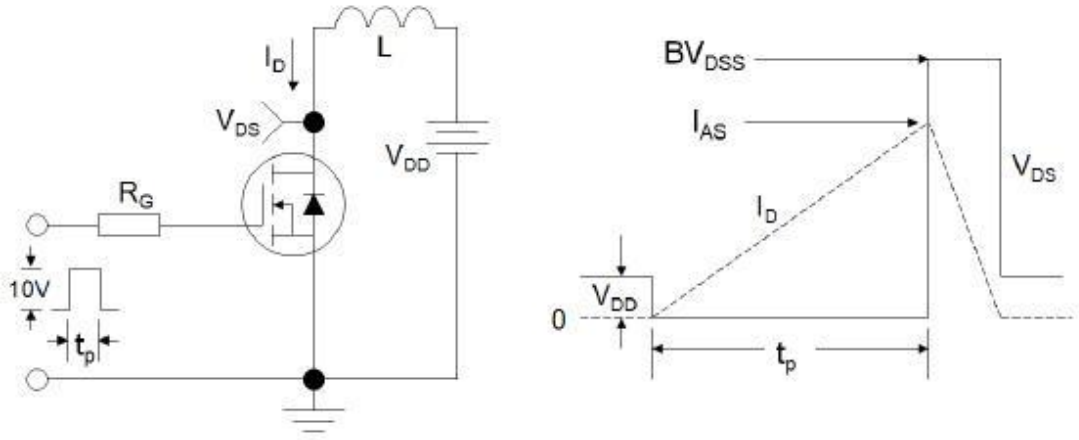


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

Typical Performance Characteristics-P

Figure1: Output Characteristics

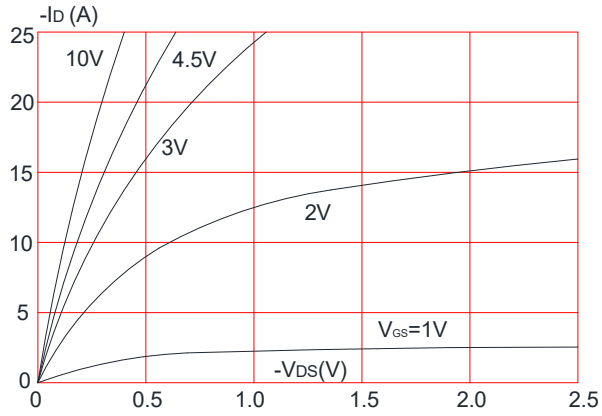


Figure 2: Typical Transfer Characteristics

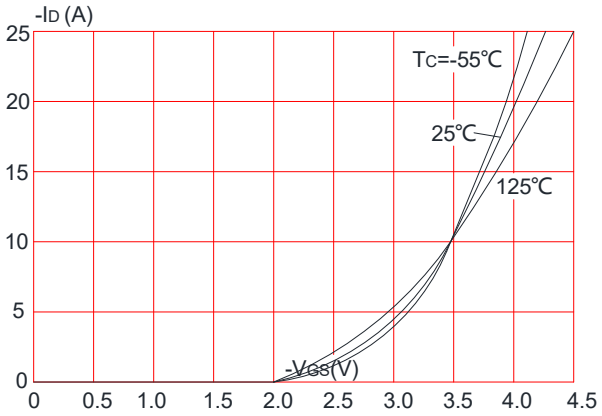


Figure 3: On-resistance vs. Drain Current

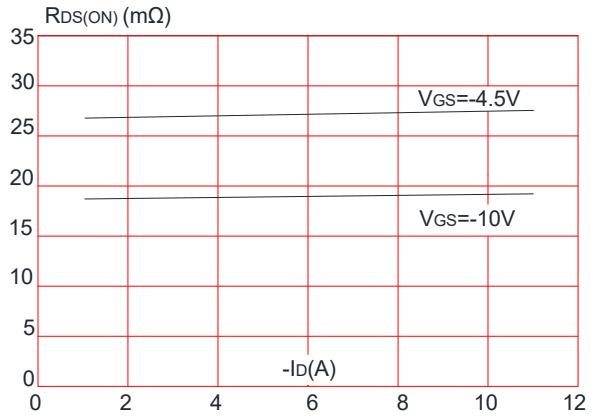


Figure 4: Body Diode Characteristics

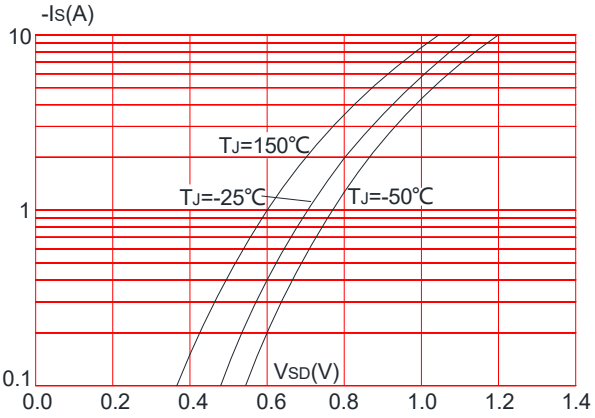


Figure 5: Gate Charge Characteristics

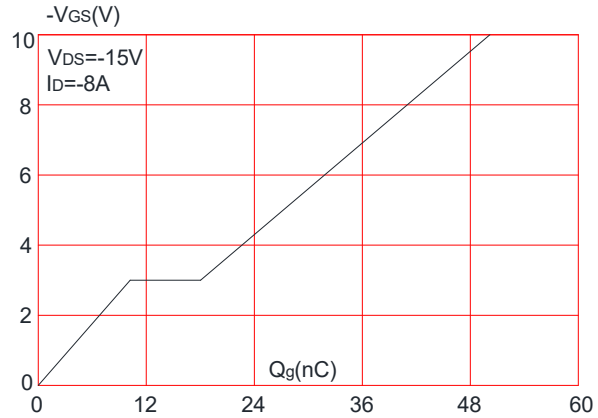


Figure 6: Capacitance Characteristics

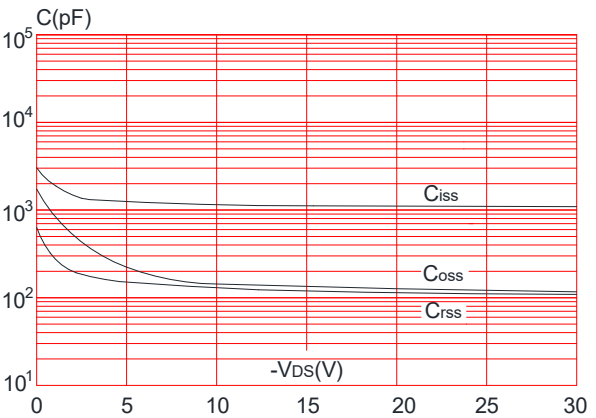


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

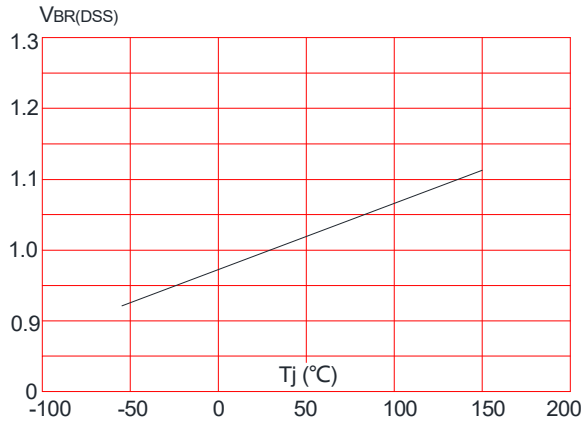


Figure 8: Normalized on Resistance vs. Junction Temperature

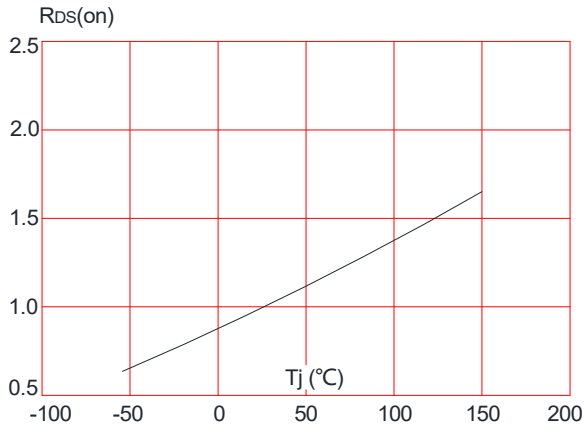


Figure 9: Maximum Safe Operating Area

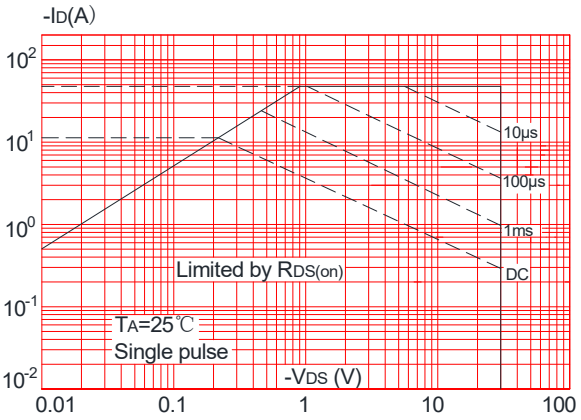


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

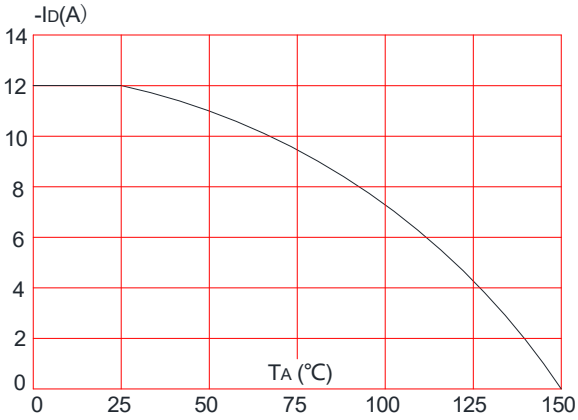
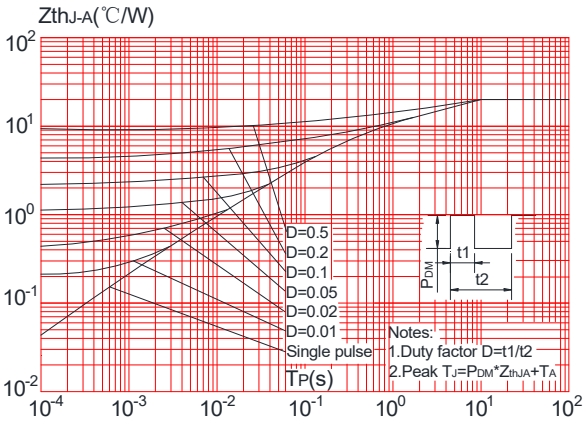
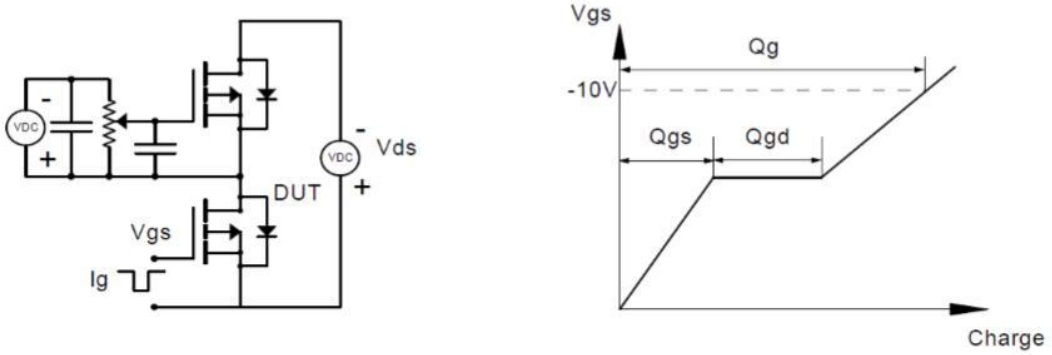


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

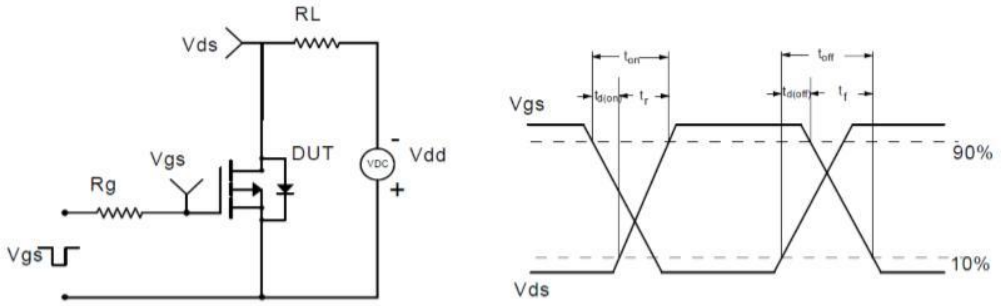


Test Circuit-P

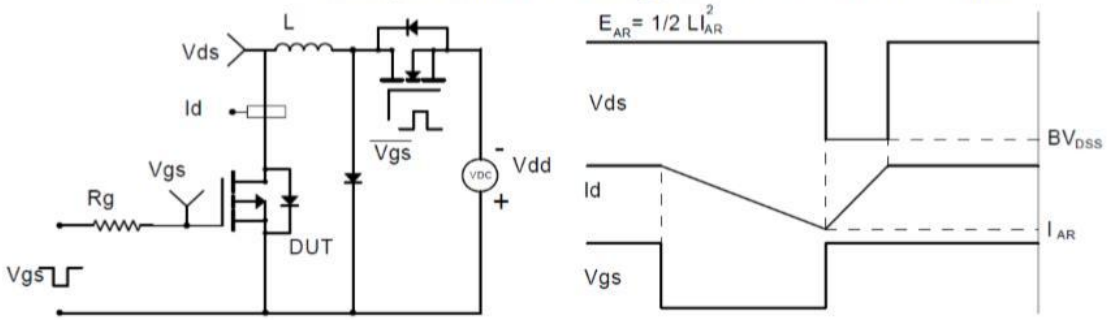
Gate Charge Test Circuit & Waveform



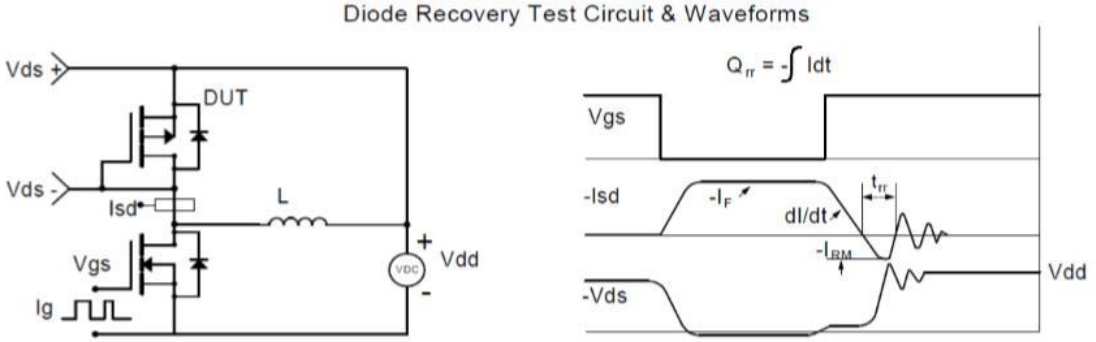
Resistive Switching Test Circuit & Waveforms



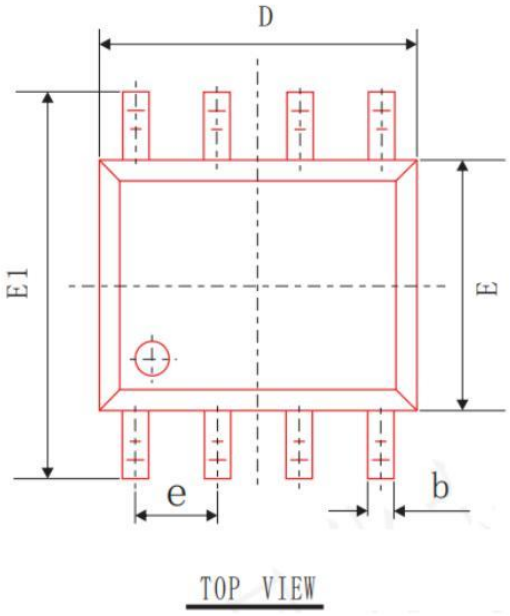
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



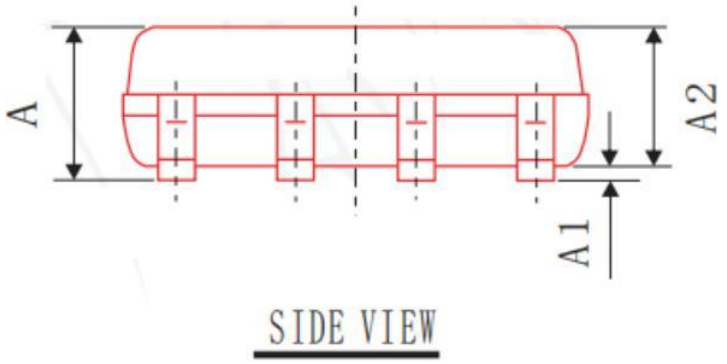
Diode Recovery Test Circuit & Waveforms



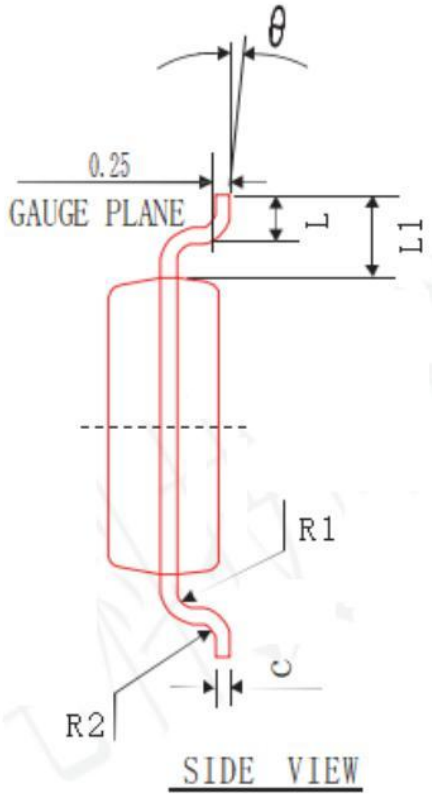
Package Mechanical Data-SOP-8



TOP VIEW



SIDE VIEW



SIDE VIEW

SYMBOL	MIN	NOM	MAX
A	1.40	1.60	1.80
A1	0.05	0.15	0.25
A2	1.35	1.45	1.55
b	0.30	0.40	0.50
c	0.153	0.203	0.253
D	4.80	4.90	5.00
E	3.80	3.90	4.00
E1	5.80	6.00	6.20
L	0.45	0.70	1.00
θ	2°	4°	6°
L1	1.04 REF		
e	1.27 BSC		
R1	0.07 TYP		
R2	0.07 TYP		

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