

Features

- -20V, -7A
 $R_{DS(ON)} < 32m\Omega @ V_{GS} = -4.5V$
 $R_{DS(ON)} < 40m\Omega @ V_{GS} = -2.5V$
- Advanced Trench Technology
- Provide Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead free product is acquired

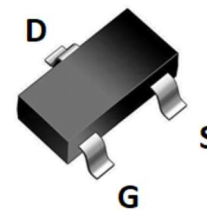
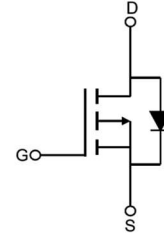
Application

- Load Switch
- PWM Application
- Power management

Marking

- Marking:P72

Package



SOT-23

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

Symbol	Parameter	Max.	Units
V_{DSS}	Drain-Source Voltage	-20	V
V_{GSS}	Gate-Source Voltage	± 12	V
I_b	Continuous Drain Current	$T_A = 25^\circ\text{C}$	-7
		$T_A = 100^\circ\text{C}$	-4.6
I_{DM}	Pulsed Drain Current <small>note1</small>	-28	A
P_D	Power Dissipation	2	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	62.5	$^\circ\text{C}/\text{W}$
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150	$^\circ\text{C}$



Electrical Characteristics (T_J=25°C 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	-20	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = -20V, V _{GS} =0V,	-	-	-1	μA
I _{GSS}	Gate to Body Leakage Current	V _{DS} =0V, V _{GS} = ±12V	-	-	±100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D = -250μA	-0.4	-	-1.0	V
R _{DS(on)}	Static Drain-Source on-Resistance <small>note2</small>	V _{GS} = -4.5V, I _D = -7A	-	-	32	mΩ
		V _{GS} = -2.5V, I _D = -5A	-	-	40	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} = -10V, V _{GS} =0V, f=1.0MHz	-	2000	-	pF
C _{oss}	Output Capacitance		-	242	-	pF
C _{rss}	Reverse Transfer Capacitance		-	231	-	pF
Q _g	Total Gate Charge	V _{DS} = -10V, I _D = -3A, V _{GS} = -4.5V	-	15.3	-	nC
Q _{gs}	Gate-Source Charge		-	2.2	-	nC
Q _{gd}	Gate-Drain("Miller") Charge		-	4.4	-	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DD} = -10V, I _D = -7A, V _{GS} = -4.5V, R _{GEN} =2.5Ω	-	10	-	ns
t _r	Turn-on Rise Time		-	31	-	ns
t _{d(off)}	Turn-off Delay Time		-	28	-	ns
t _f	Turn-off Fall Time		-	8	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	-7	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-28	A
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} =0V, I _S = -5A	-	-0.8	-1.2	V

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

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

Typical Performance Characteristics

Figure 1: Output Characteristics

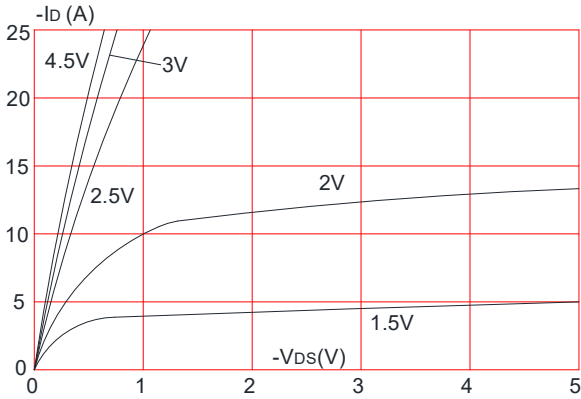


Figure 2: Typical Transfer Characteristics

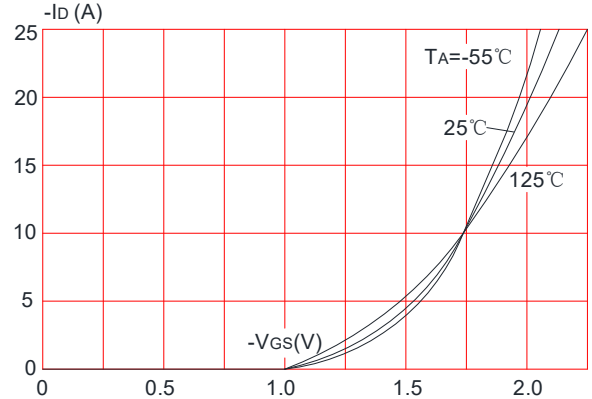


Figure 3: On-resistance vs. Drain Current

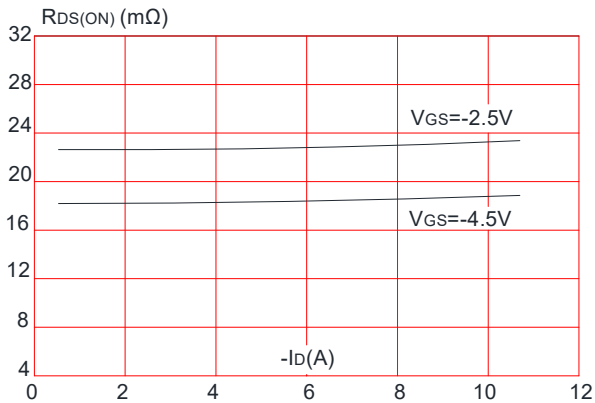


Figure 4: Body Diode Characteristics

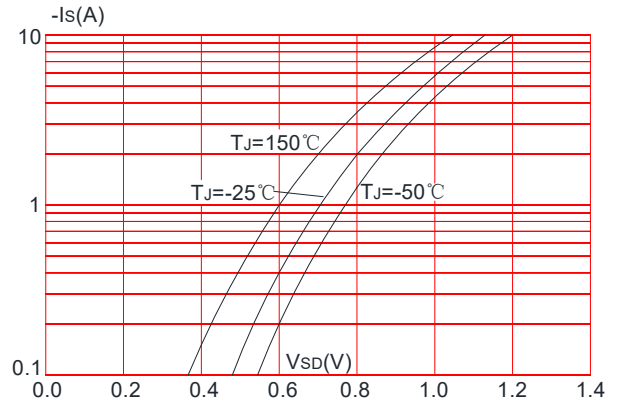


Figure 5: Gate Charge Characteristics

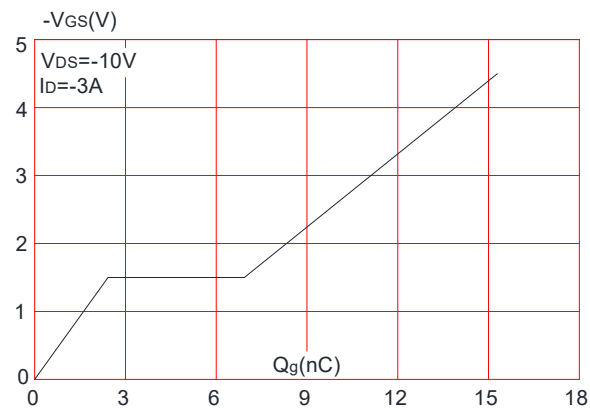


Figure 6: Capacitance Characteristics

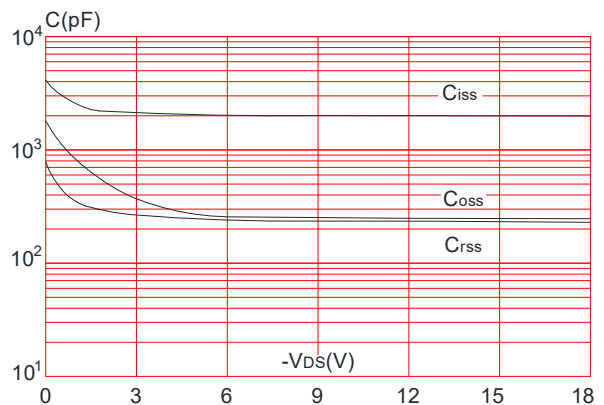


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

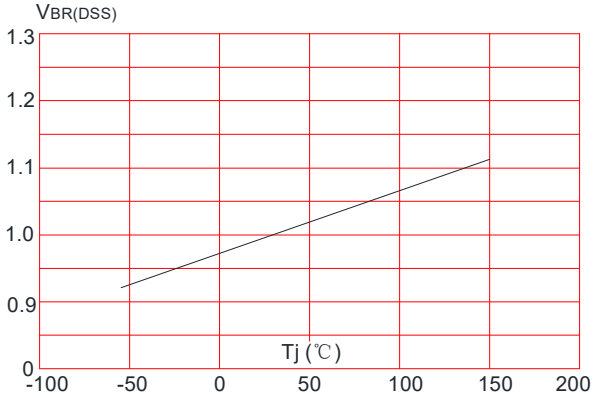


Figure 8: Normalized on Resistance vs. Junction Temperature

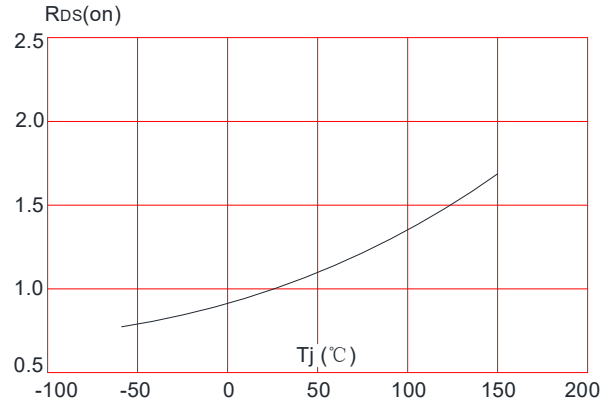


Figure 9: Maximum Safe Operating Area

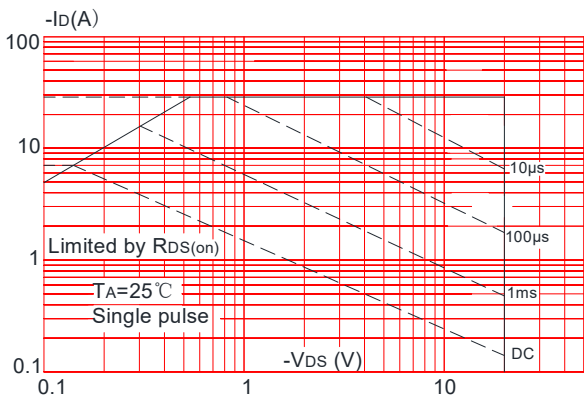


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

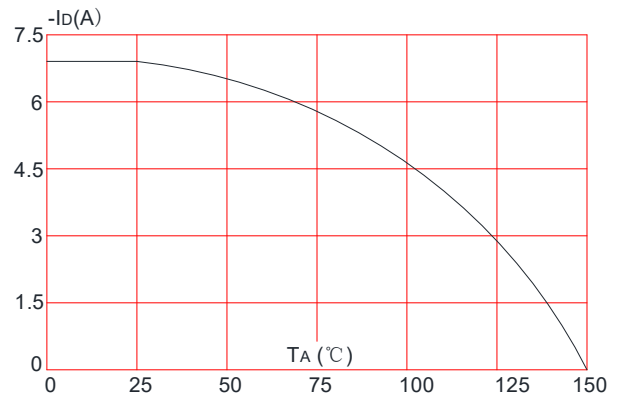
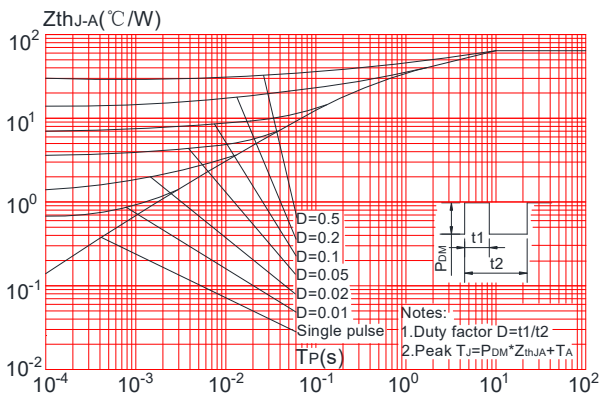
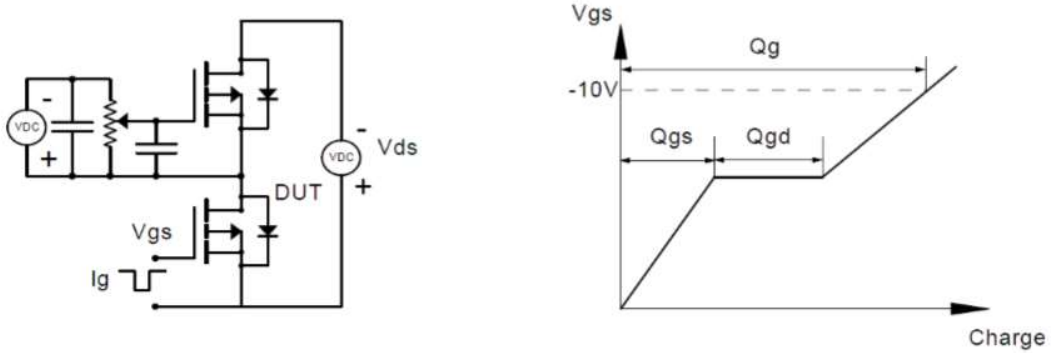


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

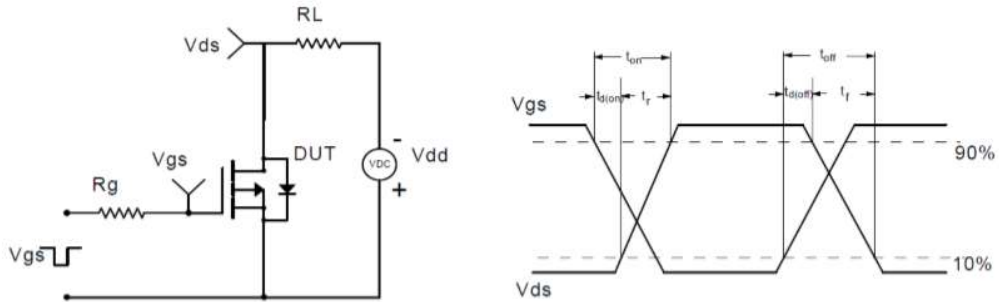


Test Circuit

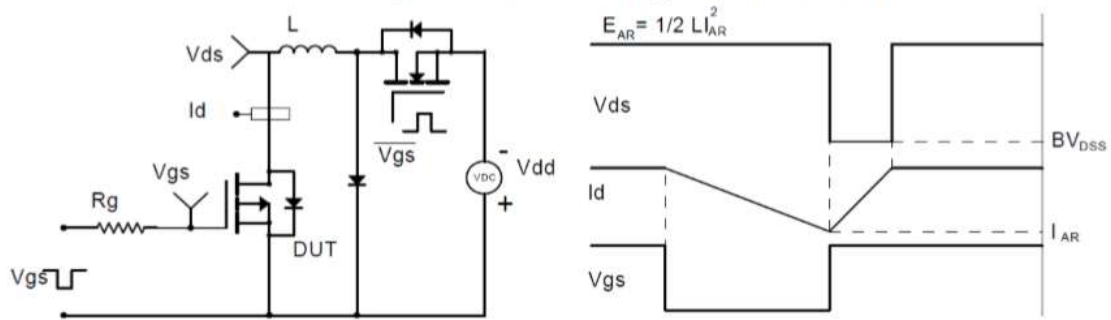
Gate Charge Test Circuit & Waveform



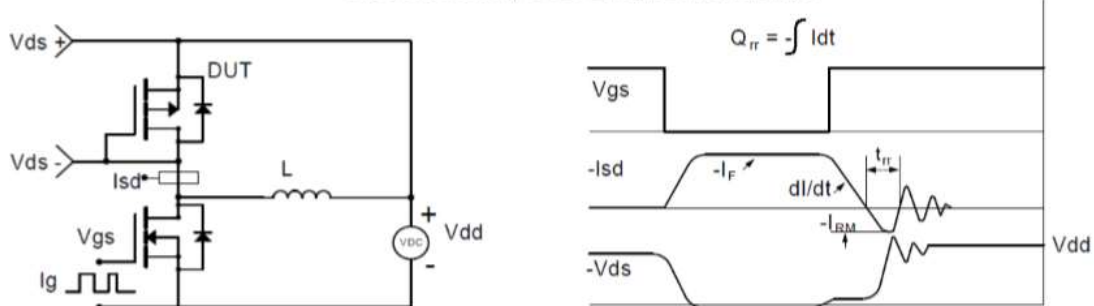
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

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