



Features

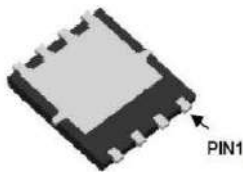
- Advanced Split Gate Trench Technology
- Excellent $R_{DS(on)}$ and Low Gate Charge
- Lead free product is acquired

Application

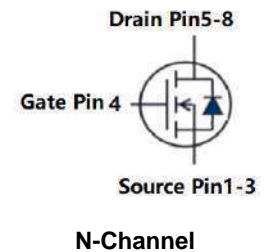
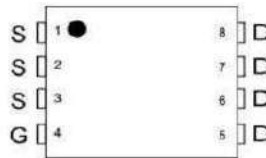
- Load Switch
- PWM Application

Product Summary

V_{DS}	40	V
$R_{DS(on),Max} @ V_{GS}=10\text{ V}$	2.2	$m\Omega$
I_D	140	A



DFN5*6-8



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

Symbol	Parameter	Max.	Units
V_{DSS}	Drain-Source Voltage	40	V
V_{GSS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current	$T_C = 25^\circ\text{C}$	140
		$T_C = 100^\circ\text{C}$	91
I_{DM}	Pulsed Drain Current ^{note1}	560	A
E_{AS}	Single Pulsed Avalanche Energy ^{note2}	125	mJ
P_D	Power Dissipation	$T_C = 25^\circ\text{C}$	83
$R_{\theta JC}$	Thermal Resistance, Junction to Case	1.7	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	55	$^\circ\text{C/W}$
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150	$^\circ\text{C}$

Electrical Characteristics ($T_J=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	40	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=40V, V_{GS}=0V,$	-	-	1.0	μA
I_{GSS}	Gate to Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$	-	-	± 100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	-	2.5	V
$R_{DS(on)}$	Static Drain-Source on-Resistance <small>note3</small>	$V_{GS}=10V, I_D=30A$	-	-	2.2	m Ω
		$V_{GS}=4.5V, I_D=20A$	-	2.7	4.8	
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=20V, V_{GS}=0V,$ $f=1.0MHz$	-	3162	-	pF
C_{oss}	Output Capacitance		-	1099	-	pF
C_{rss}	Reverse Transfer Capacitance		-	157	-	pF
Q_g	Total Gate Charge	$V_{DS}=20V, I_D=75A,$ $V_{GS}=10V$	-	95	-	nC
Q_{gs}	Gate-Source Charge		-	15	-	nC
Q_{gd}	Gate-Drain("Miller") Charge		-	11	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	$V_{DD}=20V, I_D=75A,$ $R_G=1.6\Omega, V_{GS}=10V$	-	12.5	-	ns
t_r	Turn-on Rise Time		-	7	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	50	-	ns
t_f	Turn-off Fall Time		-	8.5	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	140	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	560	A
V_{SD}	Drain to Source Diode Forward Voltage	$V_{GS}=0V, I_S=30A$	-	-	1.2	V
t_{rr}	Body Diode Reverse Recovery Time	$T_J=25^{\circ}\text{C},$ $I_F=I_S, di/dt=100A/\mu s$	-	31	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge		-	110	-	nC

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

2. EAS condition: $T_J=25^{\circ}\text{C}, V_{DD}=20V, V_G=10V, R_G=25\Omega, L=0.5mH, I_{AS}=22.4A$

3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 0.5\%$

Typical Performance Characteristics

Figure 1: Output Characteristics

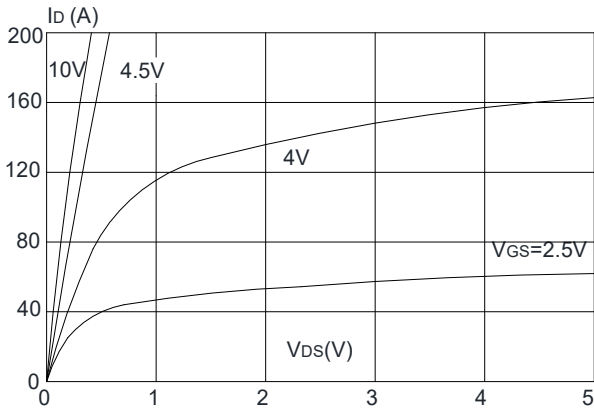


Figure 2: Typical Transfer Characteristics

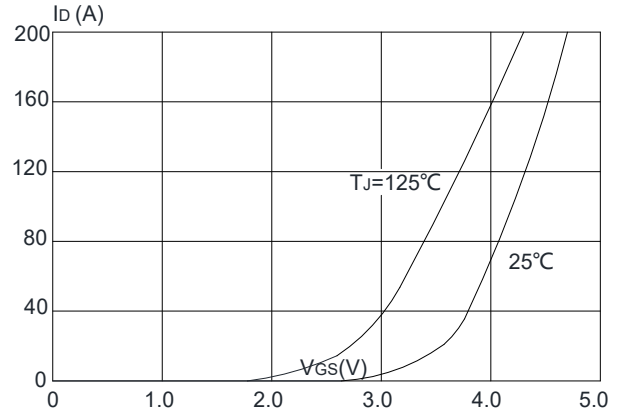


Figure 3: On-resistance vs. Drain Current

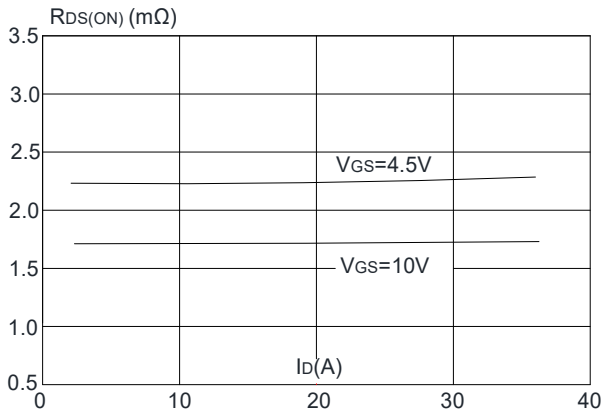


Figure 4: Body Diode Characteristics

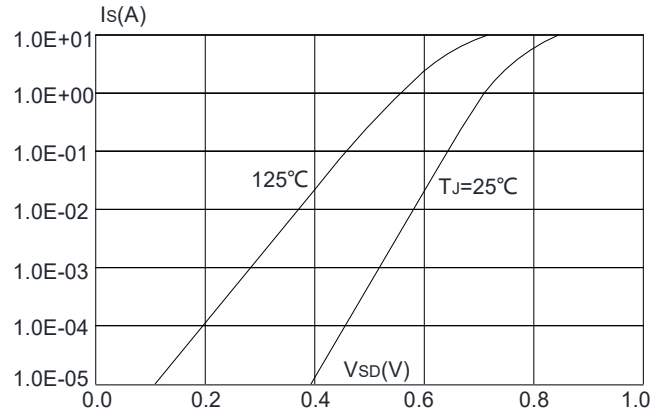


Figure 5: Gate Charge Characteristics

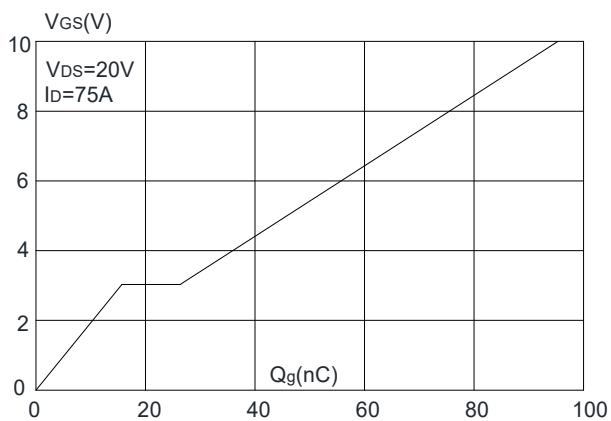


Figure 6: Capacitance Characteristics

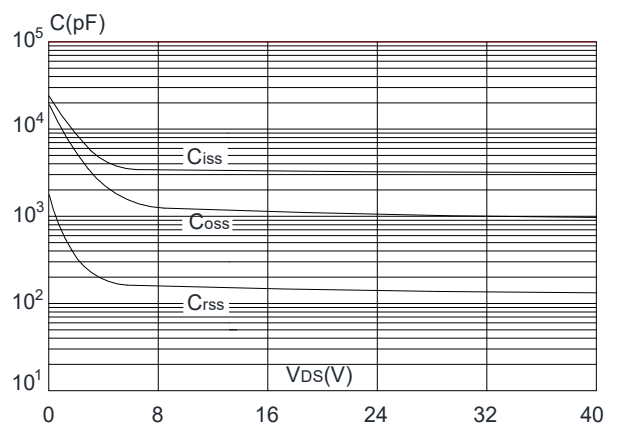


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

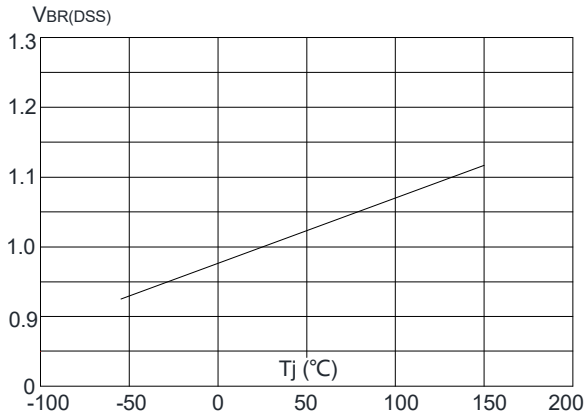


Figure 8: Normalized on Resistance vs. Junction Temperature

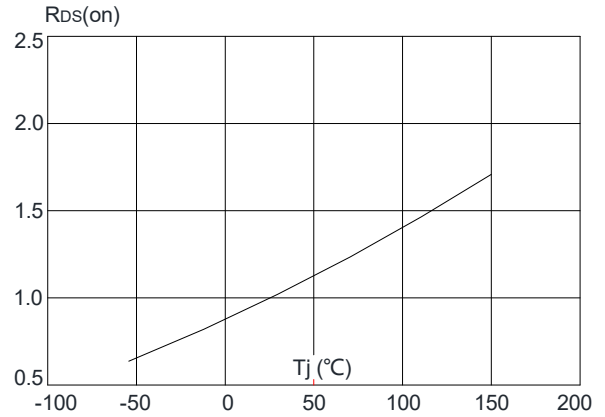


Figure 9: Maximum Safe Operating Area

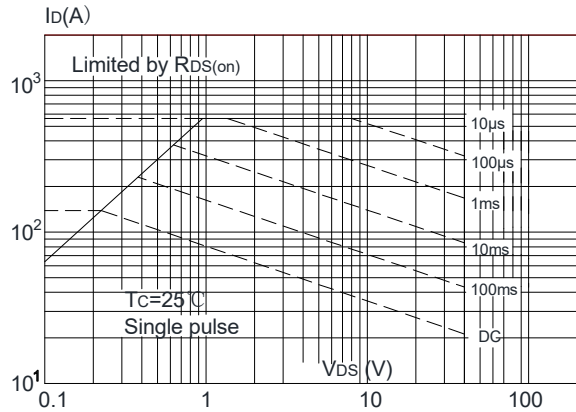


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

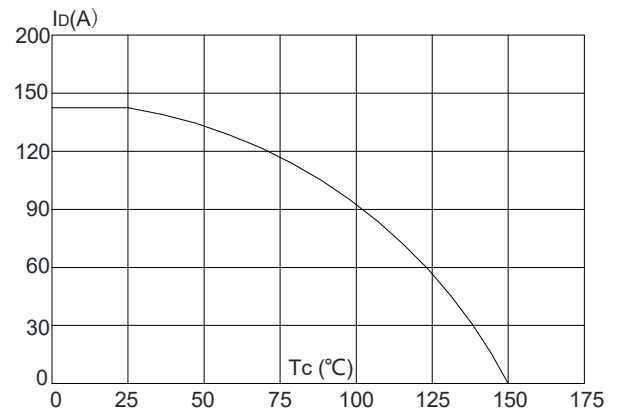
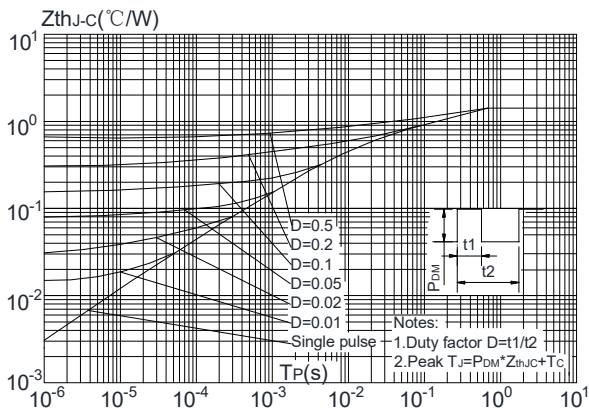


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



Test Circuit

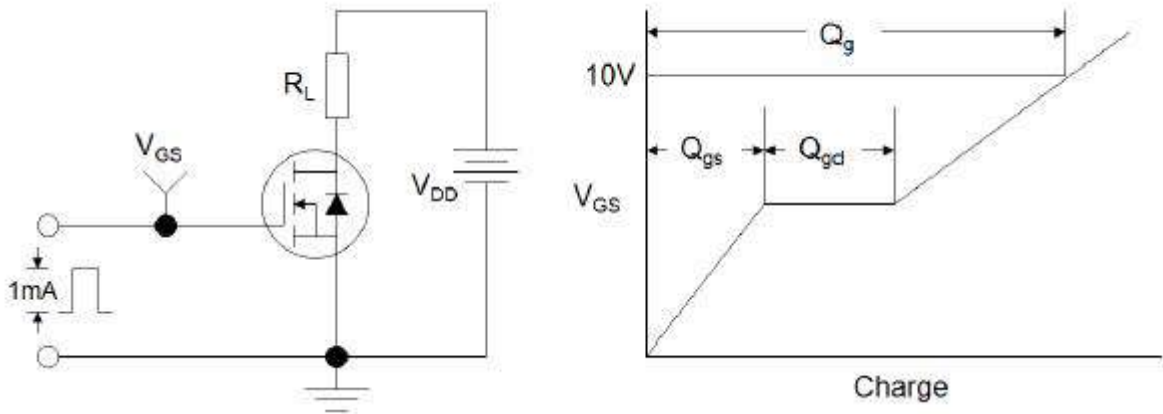


Figure1:Gate Charge Test Circuit & Waveform

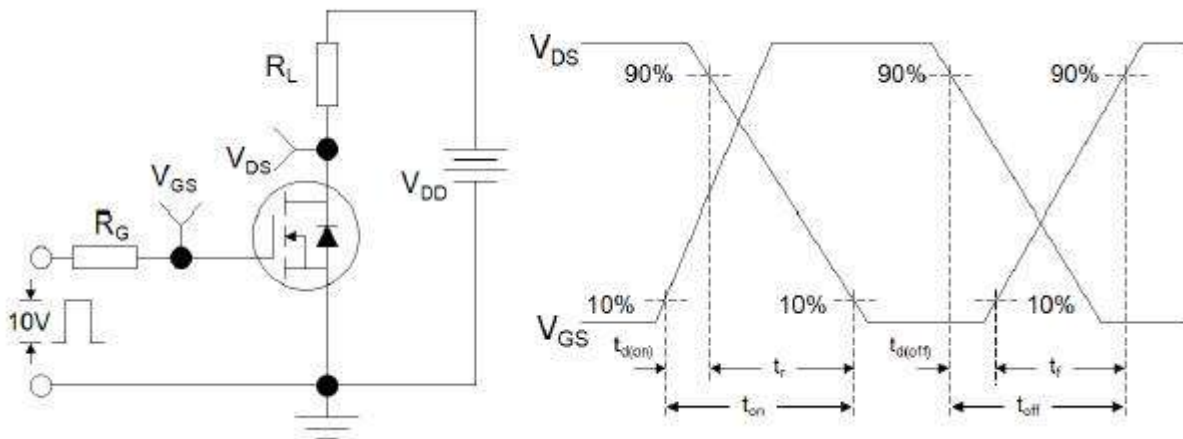


Figure 2: Resistive Switching Test Circuit & Waveforms

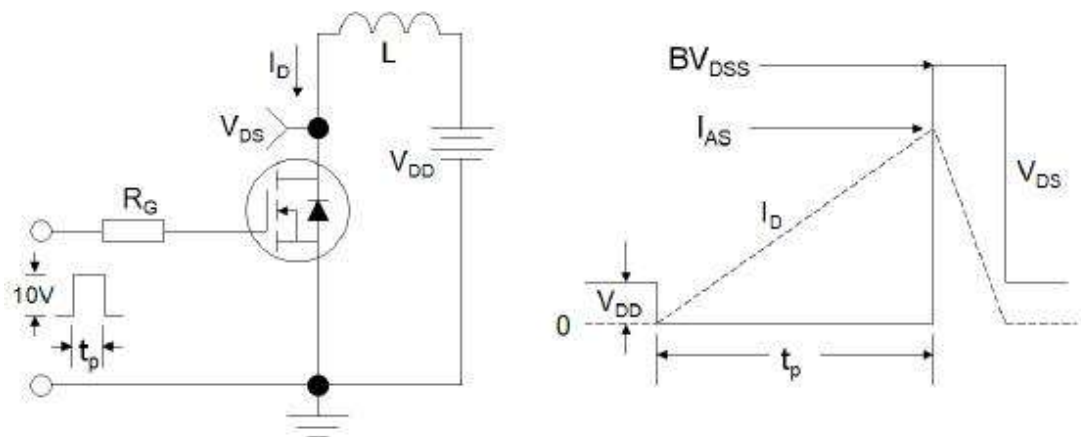
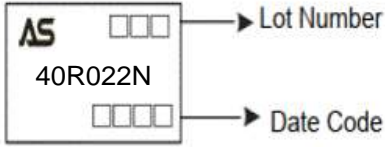
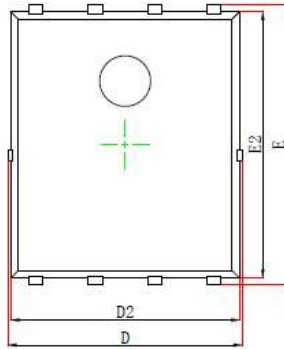


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

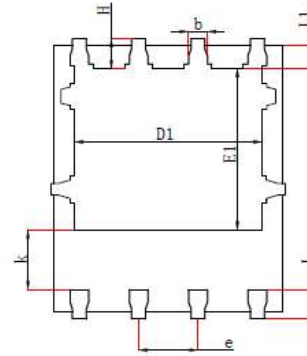
Ordering and Marking Information

Ordering Device No.	Marking	Package	Packing	Quantity
ASDM40R022NQ-R	40R022N	DFN5*6-8	Tape&Reel	4000/Reel

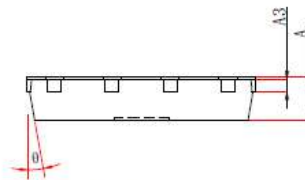
PACKAGE	MARKING
DFN5*6-8	 <p>AS □□□ → Lot Number 40R022N □□□□ → Date Code</p>

DFN5x6_P, 8 Leads


Top View
[顶视图]



Bottom View
[背视图]



Side View
[侧视图]

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.000	0.035	0.039
A3	0.254REF.		0.010REF.	
D	4.944	5.096	0.195	0.201
E	5.974	6.126	0.235	0.241
D1	3.910	4.110	0.154	0.162
E1	3.375	3.575	0.133	0.141
D2	4.824	4.976	0.190	0.196
E2	5.674	5.826	0.223	0.229
k	1.190	1.390	0.047	0.055
b	0.350	0.450	0.014	0.018
e	1.270TYP.		0.050TYP.	
L	0.559	0.711	0.022	0.028
L1	0.424	0.576	0.017	0.023
H	0.574	0.726	0.023	0.029
θ	10°	12°	10°	12°

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