Features

- Super Low Gate Charge
- Green Device Available
- Excellent Cdv/dt effect decline
- Advanced high cell density Trench technology
- 100% EAS Guaranteed

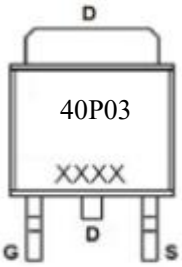
Bvdss	Rdson	ID
-30V	18mΩ	-35A

Application

RoHS

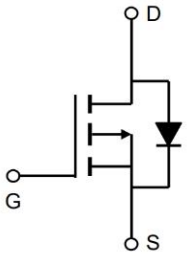
- PWM applications
- Load Switch
- Power management

Package



Marking and pin assignment

TO-252 top view



Schematic diagram

Package Marking and Ordering Information

Device Marking	Device	Device Package	Quantity
40P03	40P03	TO-252	2500

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current, V_{GS} @-10V[1]	I_D@T_A=25℃	-35	A
Continuous Drain Current, V_{GS} @-10V[1]	I_D@T_A=100℃	-17	A
Pulsed Drain Current[2]	I_{DM}	-80	A
Single Pulse Avalanche Energy[3]	E_{AS}	35	mJ
Avalanche Current	I_{AS}	-10	A
Total Power Dissipation[4]	P_D@T_A=25℃	4	W
Storage Temperature Range	T_{STG}	-55 to 150	℃
Operating Junction Temperature Range	T_J	-55 to 150	℃

Thermal Resistance Ratings

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance Junction-ambient[1]	$R_{\theta JA}$	--	32	℃/W
Thermal Resistance Junction-Case[1]	$R_{\theta JC}$	--	--	℃/W

Ordering Information

Ordering Number	Package	Pin Assignment			Packing
Halogen Free		G	D	S	
40P03	TO-252	1	2	3	Tape Reel

Electrical Characteristics (T_j=25℃unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{DSS}	V_{GS}=0V,I_D=-250μA	-30	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-30V,V_{GS}=0V	-	-	-1	μA
Gate to Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250μA	-1.0	-1.5	-2.5	V
Drain-Source On-State Resistance[3]	$R_{DS(ON)}$	V_{GS}= -10V, I_D= -9A	-	18	25	mΩ
		V_{GS}= -4.5V, I_D= -5A	-	27	38	
Input Capacitance	C_{lss}	V_{DS}= -15V,V_{GS}=0V, f=1.0MHz	-	1200	-	pF
Output Capacitance	C_{oss}		-	155	-	
Reverse Transfer Capacitance	C_{rss}		-	139	-	
Total Gate Charge	Q_g	V_{DS}= -15V,I_D= -8A, V_{GS}= -10V	-	52	-	nC
Gate-Source Charge	Q_{gs}		-	9.8	-	
Gate-Drain(“Miller”)Charge	Q_{gd}		-	8.3	-	
Turn-on Delay Time	$T_{d(on)}$	V_{DD}= -15V,I_D= -1A, R_{GEN}=6Ω，V_{GS}= -10V	-	13	-	nS
Turn-on Rise Time	t_r		-	15	-	
Turn-Off Delay Time	$T_{d(off)}$		-	198	-	
Turn-Off Fall Time	T_f		-	98	-	
Maximum Continuous Drain to Source Diode Forward Current	I_S	-	-	-	-35	A
Maximum Pulsed Drain to Source Diode Forward Current	I_{SM}	-	-	-	-80	A
Drain to Source Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_S= -9A	-	-0.8	-1.2	V

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. E_{AS} condition: T_J=25℃, V_{DD}=-15V, V_G=-10V, R_G=25Ω, L=0.5mH, I_{AS}=-10A
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%

Typical Performance Characteristics

Figure1: Output Characteristics

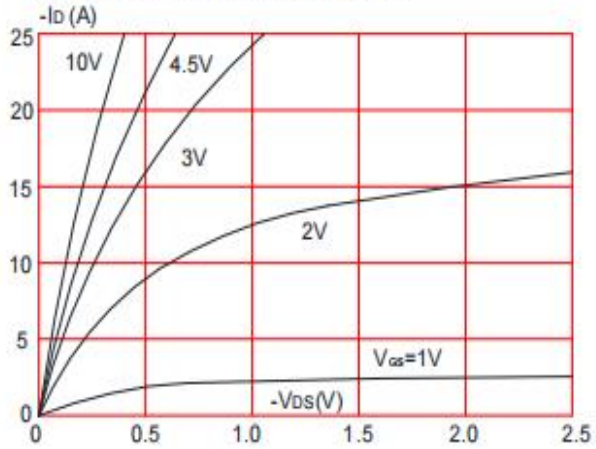


Figure 2: Typical Transfer Characteristics

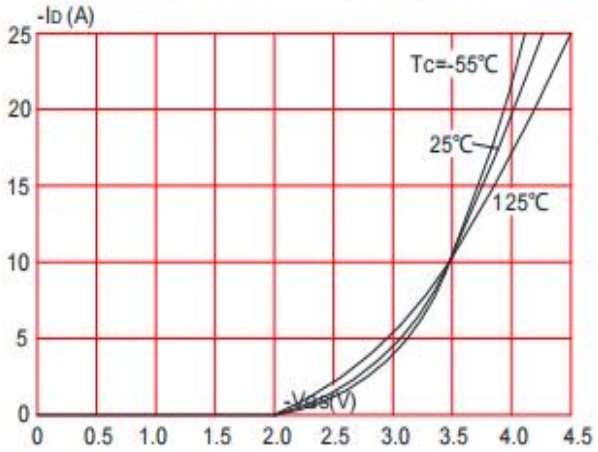


Figure 3: On-resistance vs. Drain Current

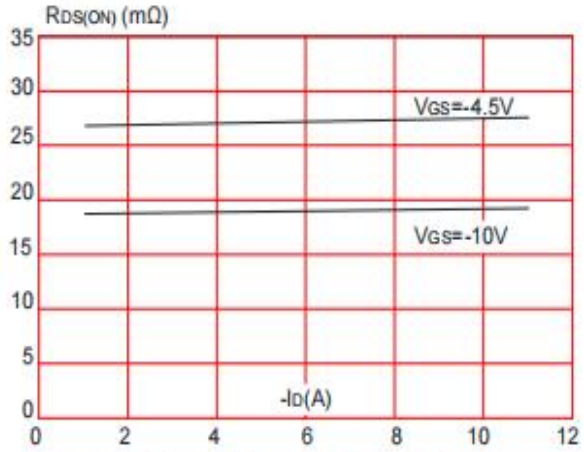


Figure 4: Body Diode Characteristics

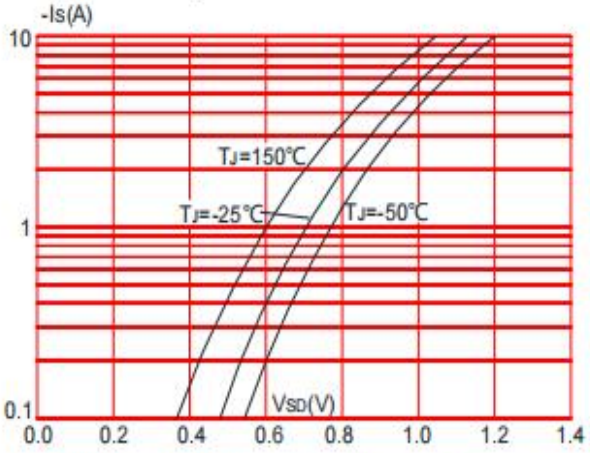


Figure 5: Gate Charge Characteristics

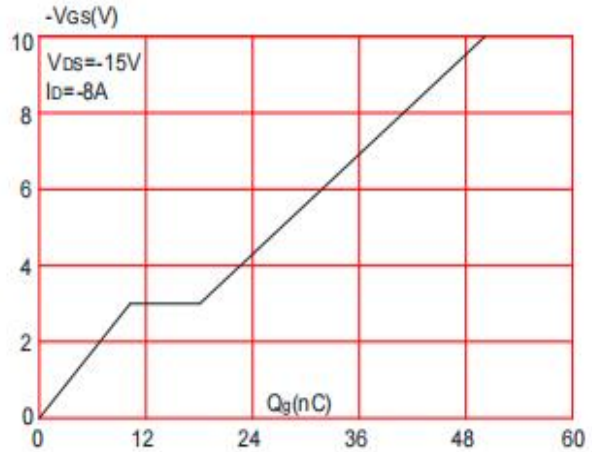


Figure 6: Capacitance Characteristics

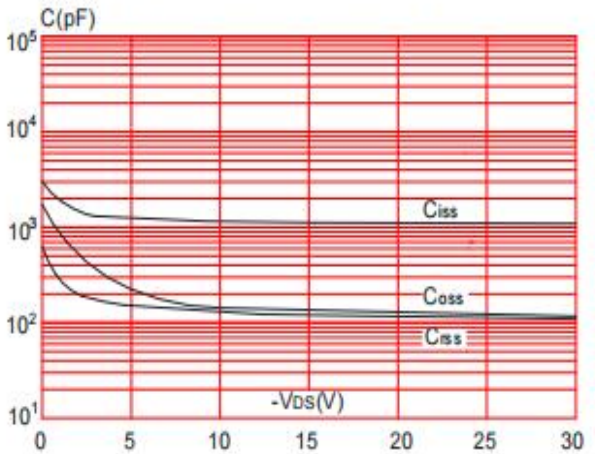


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

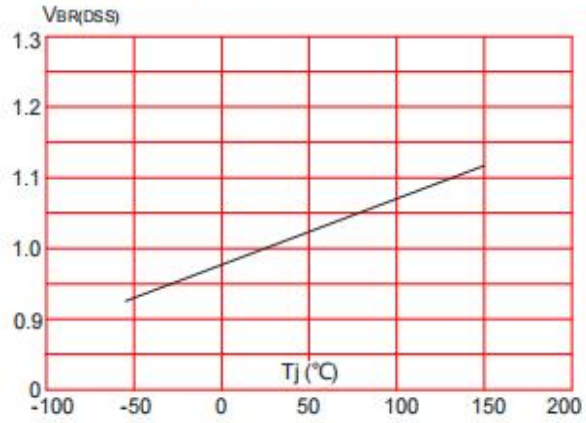


Figure 8: Normalized on Resistance vs. Junction Temperature

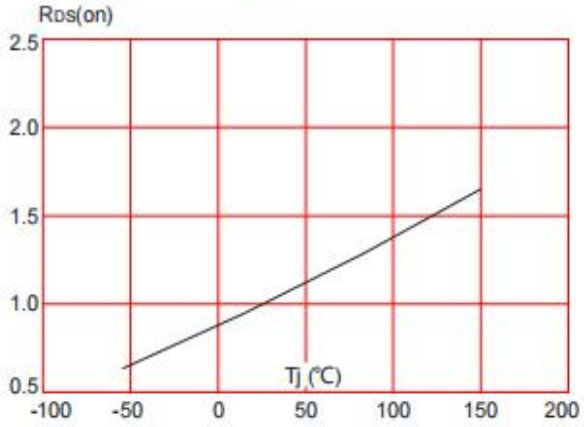


Figure 9: Maximum Safe Operating Area

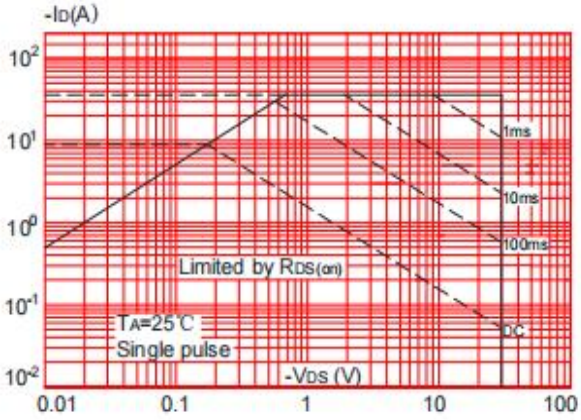


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

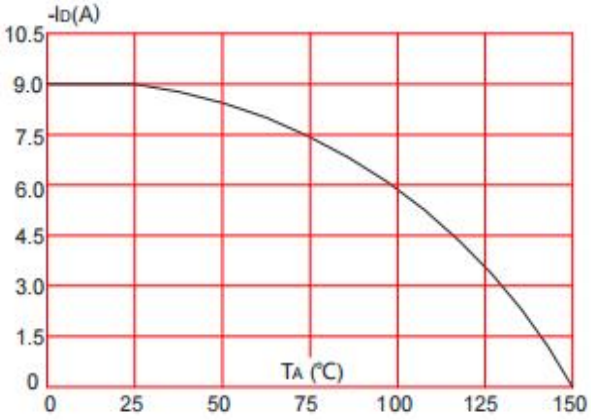
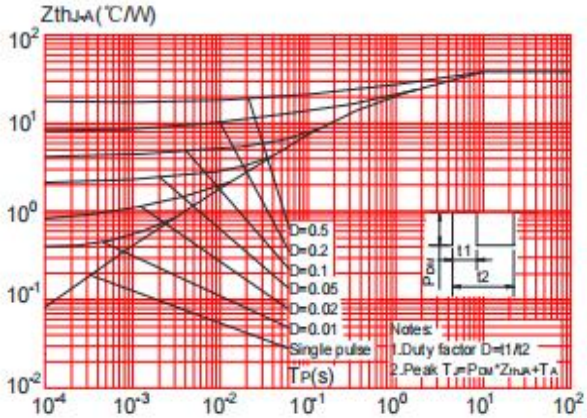
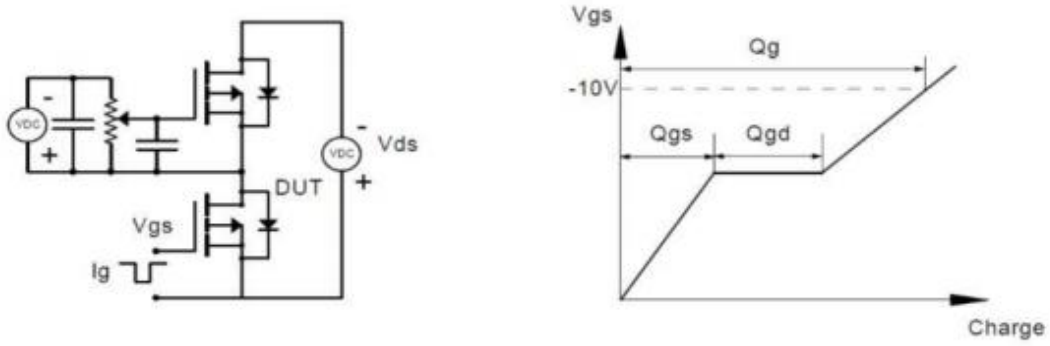


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

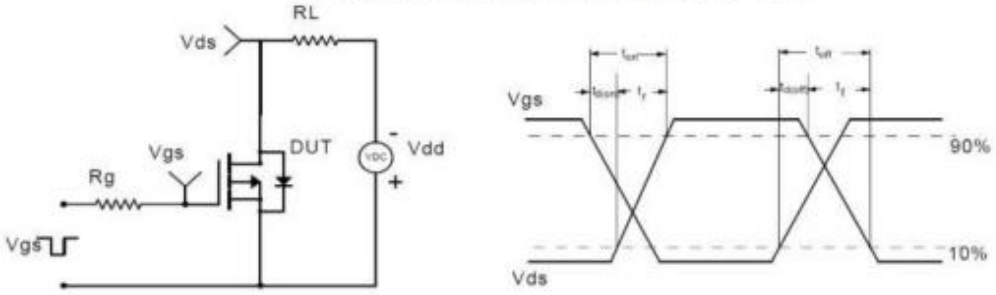


Test Circuit & Waveform

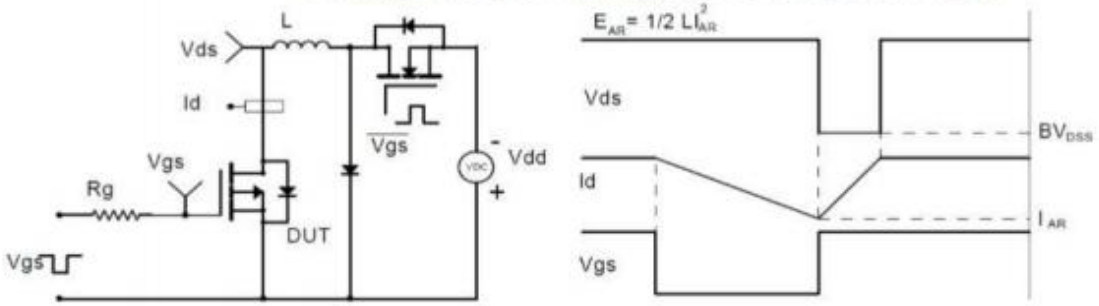
Gate Charge Test Circuit & Waveform



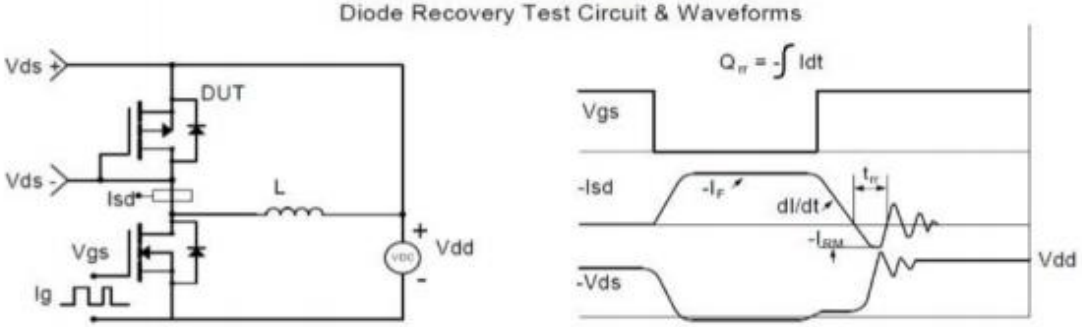
Resistive Switching Test Circuit & Waveforms



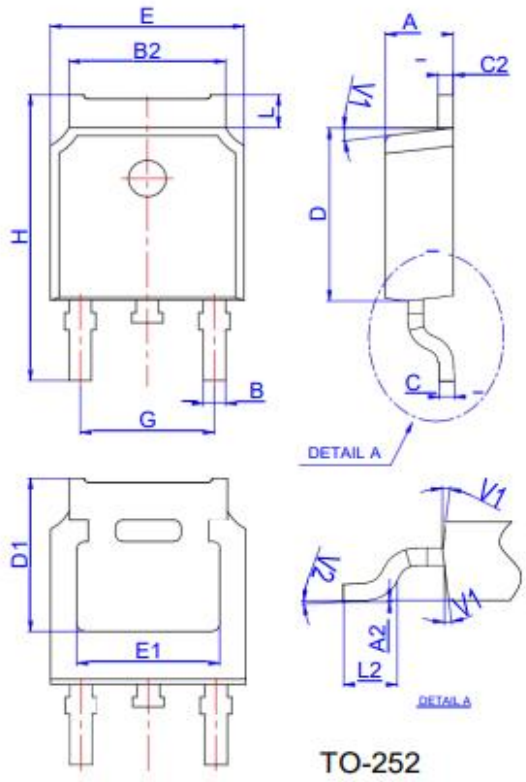
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



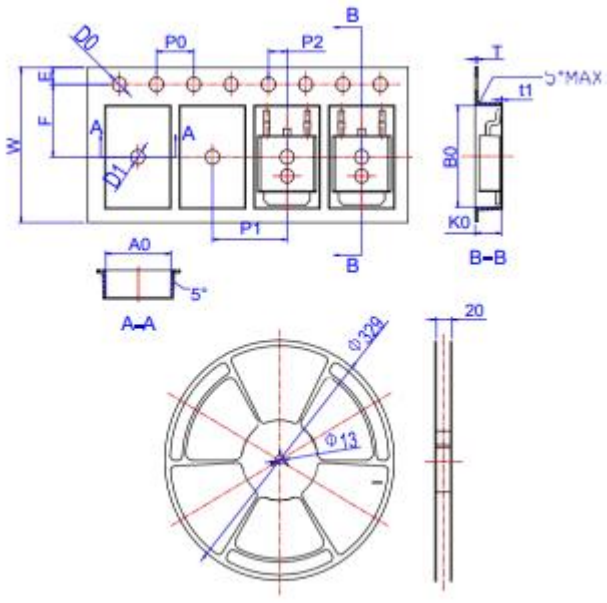
Diode Recovery Test Circuit & Waveforms



Package Mechanical Data TO-252



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
W	15.90	16.00	16.10	0.626	0.630	0.634
E	1.65	1.75	1.85	0.065	0.069	0.073
F	7.40	7.50	7.60	0.291	0.295	0.299
D0	1.40	1.50	1.60	0.055	0.059	0.063
D1	1.40	1.50	1.60	0.055	0.059	0.063
P0	3.90	4.00	4.10	0.154	0.157	0.161
P1	7.90	8.00	8.10	0.311	0.315	0.319
P2	1.90	2.00	2.10	0.075	0.079	0.083
A0	6.85	6.90	7.00	0.270	0.271	0.276
B0	10.45	10.50	10.60	0.411	0.413	0.417
K0	2.68	2.78	2.88	0.105	0.109	0.113
T	0.24		0.27	0.009		0.011
t1	0.10			0.004		
10P0	39.80	40.00	40.20	1.567	1.575	1.583

Important Notice and Disclaimer

HL Microelectronics reserves the right to make changes to this document and its products and specifications at any time without notice.
Customers should obtain and confirm the latest product information and specifications before final design, purchase or use.

HL Microelectronics makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, not does HL Microelectronics assume any liability for application assistance or customer product design.

HL Microelectronics does not warrant or accept any liability with products which are purchased or used for any unintended or unauthorized application.

No license is granted by implication or otherwise under any intellectual property rights of HL Microelectronics.

HL Microelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of HL Microelectronics.