

100V/120A N-Channel Advanced Power MOSFET

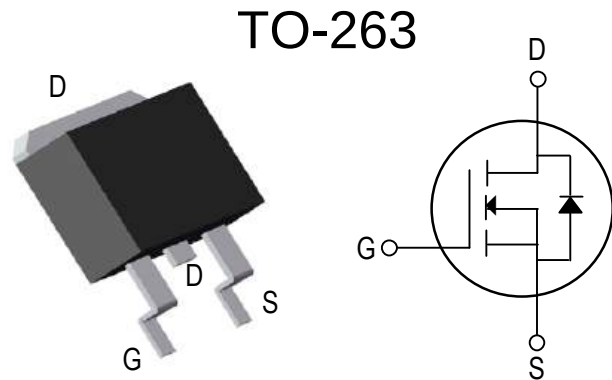
BVDSS	100	V
ID	120	A
R _{DS(on)} @V _{GS} =10V	4.2	mΩ

Features

- Fast switching
- Low R_{DS(on)} & FOM
- Low Gate Charge

Application

- High Frequency Switching
- Synchronous Rectification


Order Information

Product	Package	Marking	Packing
M10N042R	TO-263	PGY10N042	800PCS/REF

Absolute Maximum Ratings (TC =25℃)

PARAMETER	SYMBOL	Value	UNIT
Drain-Source Breakdown Voltage	BV _{DSS}	100	V
Gate-Source Voltage	V _{GS}	±20	V
Continuous Drain Current ,T _C = 25℃	I _D	120	A
Pulsed drain current (TC = 25℃, tp limited by Tjmax) ¹	I _D pulse	480	A
Single Pulse Avalanche Energy ²	E _{AS}	280	mJ
Power Dissipation(TC=25℃)	P _D	156	W
Operating Temperature	T _J	150	℃
Storage Temperature	T _{STG}	-55~+150	℃

Thermal Characteristics

PARAMETER	SYMBOL	Value	UNIT
Thermal Resistance Junction-case	R _{thJC}	0.8	℃/W
Thermal Resistance Junction-ambient	R _{thJA}	65	℃/W

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Electronic Characteristics $T_J=25^{\circ}\text{C}$ unless otherwise specified

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	100	--	--	V
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2	3	4	V
Drain-source On Resistance ³	$R_{DS(ON)}$	$V_{GS}=10V, I_D=50A$	--	3.9	4.5	m Ω
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=100V, V_{GS}=0$	--	--	1	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20, V_{DS}=0V$	--	--	± 100	nA
Input Capacitance	C_{iss}	$V_{GS}=0V,$ $V_{DS}=50V$ $f=1.0MHz$	--	4701	--	pF
Output Capacitance	C_{oss}		--	1506	--	
Reverse transfer Capacitance	C_{rss}		--	73.36	--	
Turn -Off Delay Time	$T_d(off)$	$V_{DD}=50V,$ $I_D=50A$ $V_{GS}=10V,$ $R_G=3\Omega$	--	14.3	--	ns
Turn-on delay time	$T_d(on)$		--	20.8	--	
Rise time	T_r		--	57.7	--	
Fall time	T_f		--	31.9	--	
Total Gate Charge	Q_g	$I_D=20A,$ $V_{DS}=15V$ $V_{GS}=10V$	--	74.5	--	nC
Gate-to-Source Charge	Q_{gs}		--	14.2	--	
Gate-to-Drain Charge Q_{gd}			--	22.5	--	
Continuous Diode Forward Current	I_S	--	--	--	111	A
Diode Forward Voltage	V_{SD}	$T_J=25^{\circ}\text{C}, I_S=20.0A$ $V_{GS}=0V$	--	--	1.2	V

Notes:

1.Repetitive Rating: Pulse width limited by maximum junction temperature.

2. $V_{DD}=50V, V_{GS}=10V, R_G=25\Omega$

3. Pulse Test : Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$

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Typical Characteristics

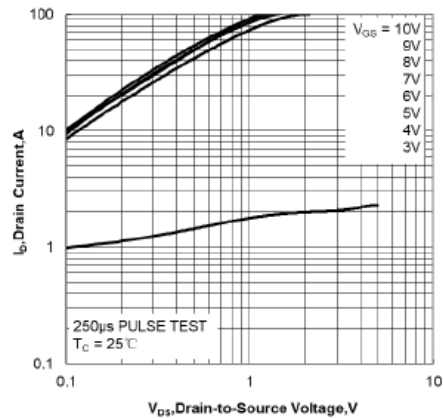


Figure 1. Output Characteristics

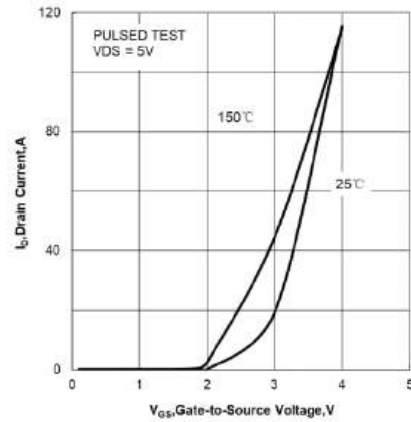


Figure 2. Transfer Characteristics

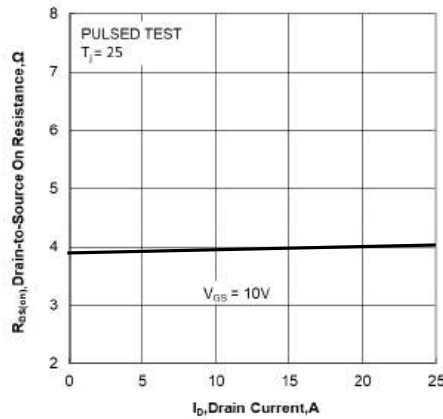


Figure 3. Drain-to-Source On Resistance vs Drain Current

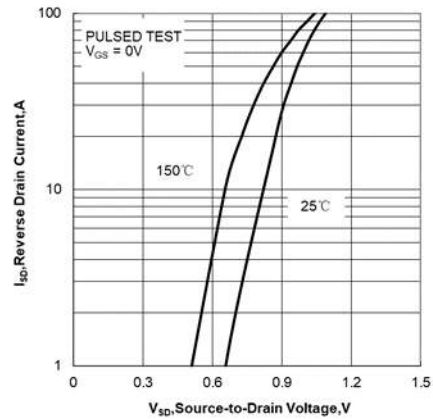


Figure 4. Body Diode Forward Voltage vs Source Current and Temperature

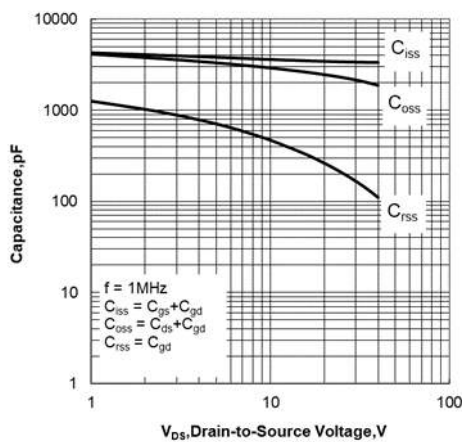


Figure 5. Capacitance Characteristics

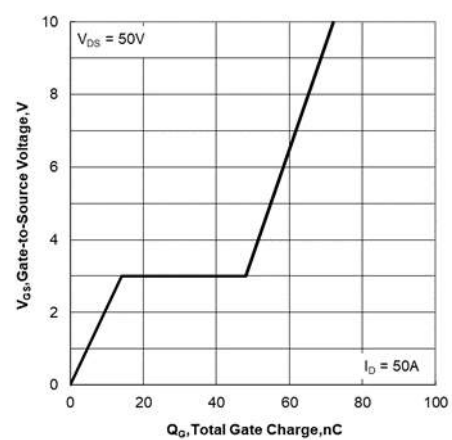


Figure 6. Gate Charge Characteristics

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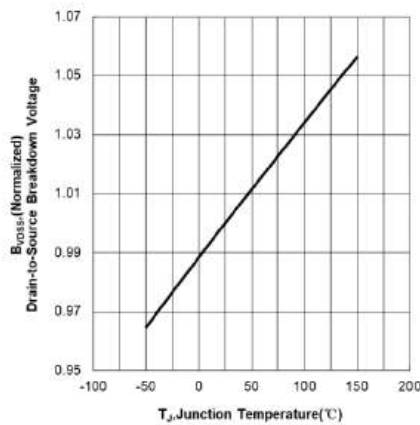


Figure 7. Normalized Breakdown Voltage vs Junction Temperature

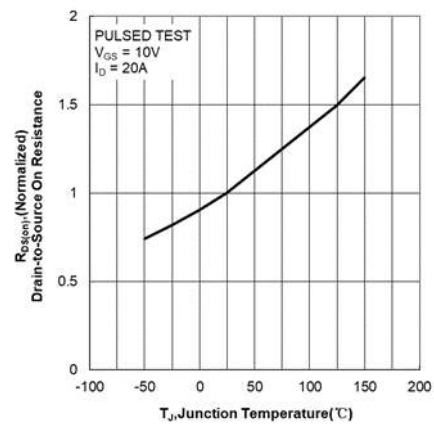


Figure 8. Normalized On Resistance vs Junction Temperature

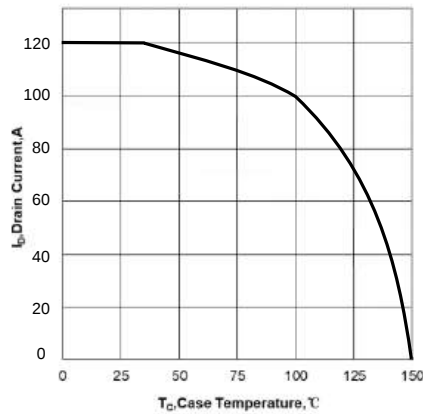


Figure 9. Maximum Continuous Drain Current vs Case Temperature

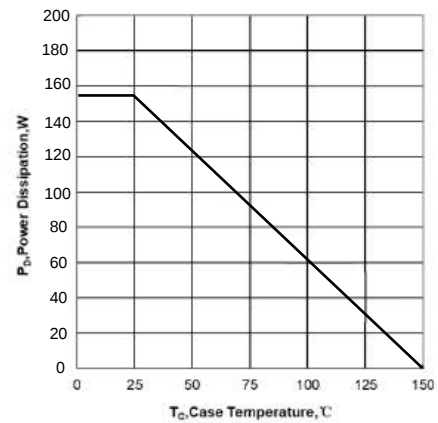


Figure 10. Maximum Power Dissipation vs Case Temperature

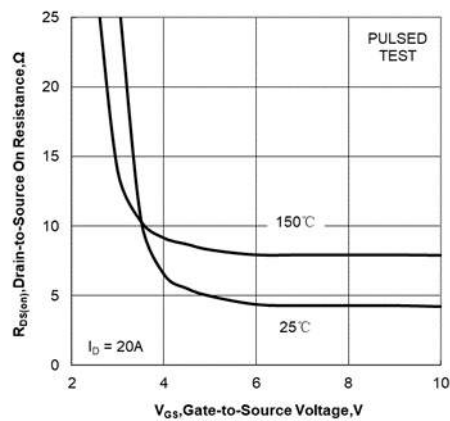


Figure 11. Drain-to-Source On Resistance vs Gate Voltage and Drain Current

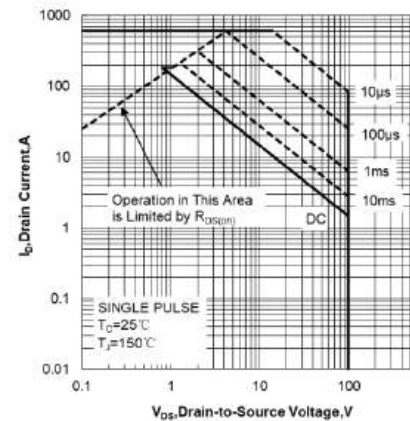


Figure 12. Maximum Safe Operating Area

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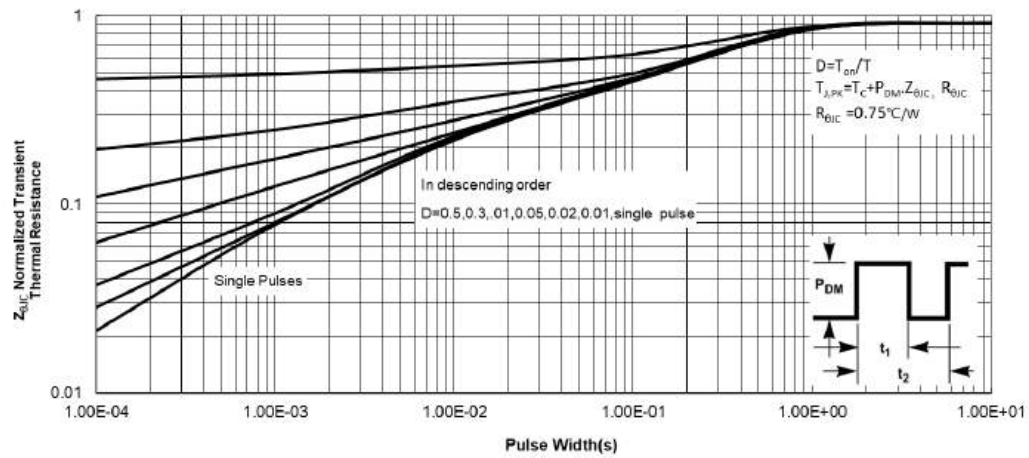


Figure 13. Maximum Effective Transient Thermal Impedance, Junction-to-Case

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Test circuit

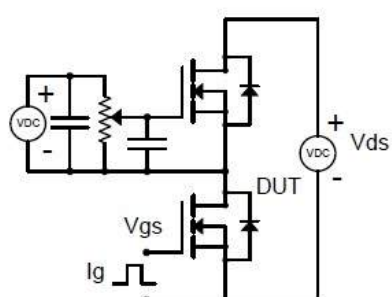


FIG.10 Gate Charge Test Circuit & Waveforms

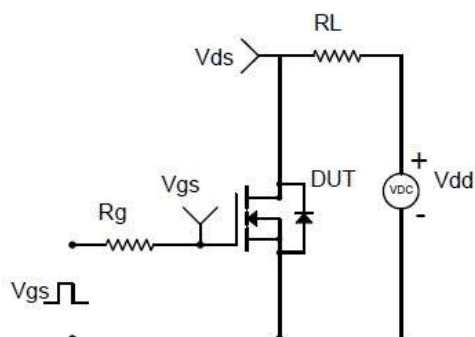
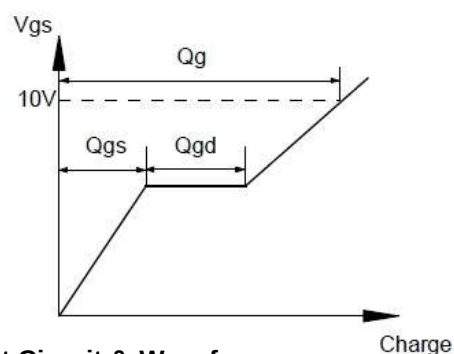


FIG.11 Resistive Switching Test Circuit & Waveforms

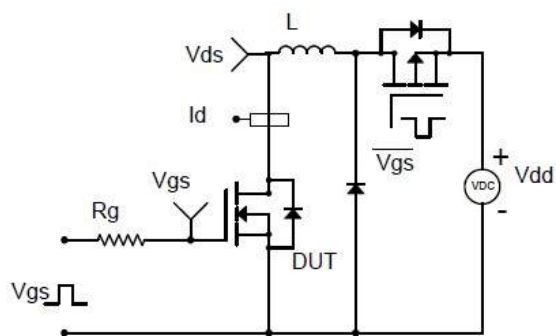
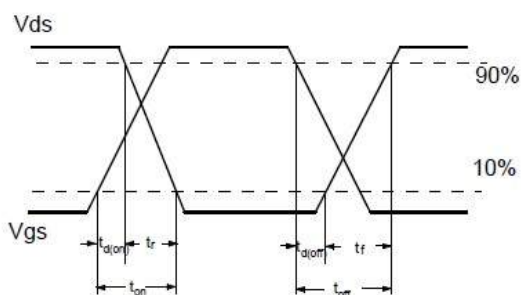


FIG.12 Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

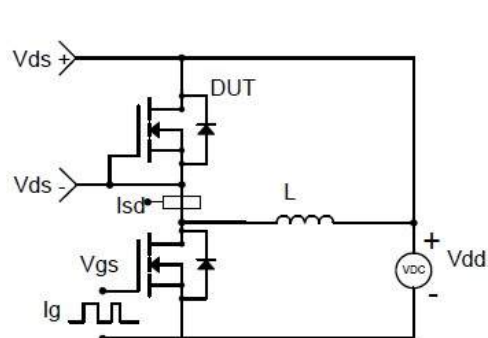
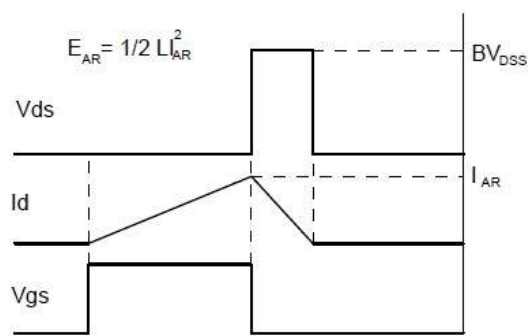
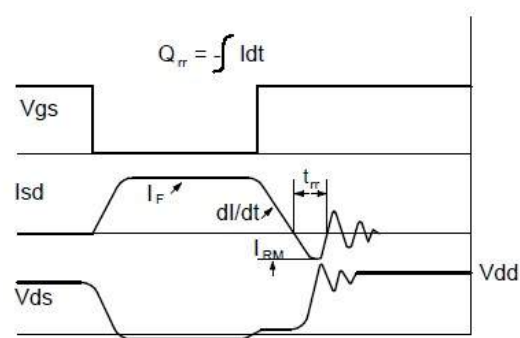
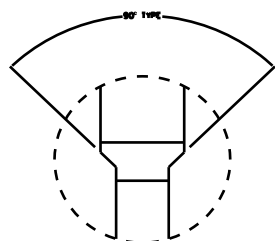


FIG.13 Diode Recovery Test Circuit & Waveforms

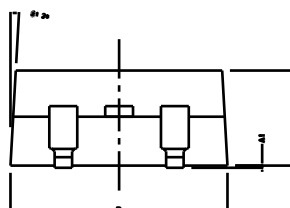


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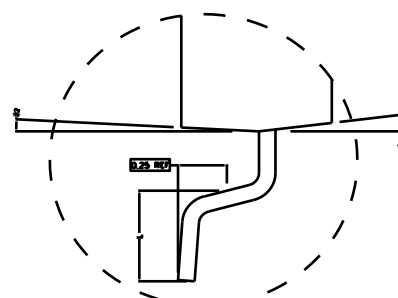
TO-263 Package Outline Dimensions (Units: mm)



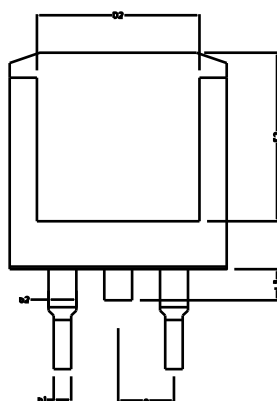
DETAIL F



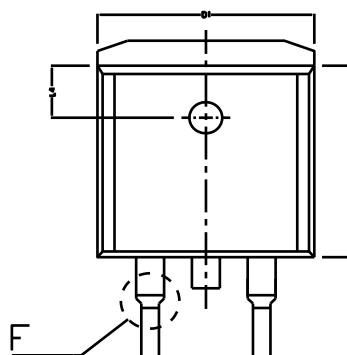
SIDE VIEW



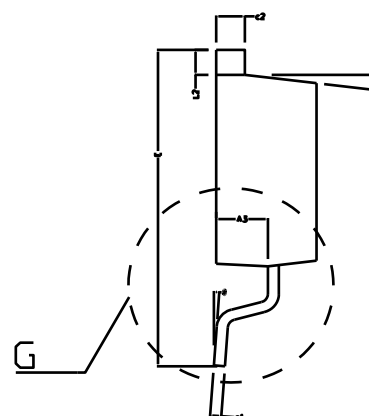
DETAIL G



BOTTOM VIEW



TOP VIEW



SIDE VIEW

COMMON DIMENSIONS
(UNITS OF MEASURE IS mm)

	MIN	NORMAL	MAX
A1	0.020	0.100	0.200
A2	4.470	4.570	4.670
A3	2.300	2.350	2.400
b1	0.750	0.800	0.850
b2	1.220	1.270	1.320
c1	0.450	0.500	0.550
c2	1.250	1.300	1.350
D	9.900	10.000	10.100
D1	9.880REF		
D2	7.400REF		
E	14.900	15.100	15.300
E1	9.000	9.100	9.200
E2	8.100REF		
e	2.540TYPE		
L	2.100	2.300	2.500
L2	1.100	1.200	1.300
L3	1.300	1.500	1.700
L4	2.50 TYPE		
θ1	3° TYPE		
θ2	3° TYPE		
θ3	7° TYPE		
θ4	7° TYPE		
θ	0 ~ 8°		