

MOSFETs Silicon 30V N-Channel MOS
■ Applications

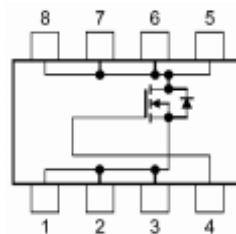
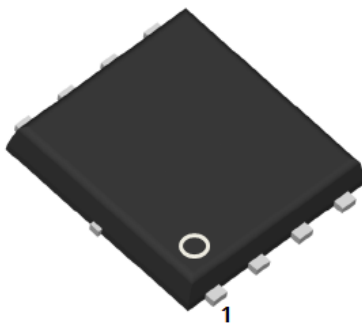
- Synchronus Rectification
- Industrial and Motor Drive
- DC/DC and AC/DC Converters
- Power Tools

■ Features

- High-Speed Switching
- Low $R_{DS(ON)}$
- Capable of 4.5 V Gate Drive
- Good stability and uniformity with high EAS
- RoHS and Halogen-Free Compliant
- 100% UIS and RG Tested

■ Product Summary

V_{DS}	30	V
I_D	75	A
$R_{DS(ON)}, Typ@10V$	4.5	m Ω
$R_{DS(ON)}, Typ@4.5V$	6	m Ω
Q_g	20	nC



Gate: 4
Drain: 5-8
Source: 1-3

DFN5X6

Marking	Package	Packaging	Min. package quantity
MDG005R030TL	DFN5X6	Tape & Reel	5000





■ Absolute Maximum Ratings (Tc=25°C unless otherwise noted)

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current Tc=25°C (Note 1)	I_D	75	A
Continuous Drain Current Tc=100°C (Note 1)		52	A
Drain Current-Pulsed (Note 1)	I_{DM}	180	A
Total Dissipation	P_D	60	W
Junction Temperature	T_J	150	°C
Storage Temperature	T_{stg}	-55-150	°C
Single Pulse Avalanche Energy (Note 2)	E_{AS}	180	mJ

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

■ Thermal Characteristics

Parameter	Symbol	Max	Unit
Maximum Junction-to-Case	$R_{\theta JC}$	2.1	°C/W
Maximum Junction-to-Ambient (Note 3)	$R_{\theta JA}$	60	°C/W

Note 1: Ensure that the channel temperature does not exceed 150°C.

Note 2: $V_{DD}=30V$, $T_{ch}=25^{\circ}C$ (initial), $L=0.5mH$, $R_g=25\Omega$.

Note 3: The value of $R_{\theta JA}$ is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^{\circ}C$. The value in any given application depends on the user's specific board design.

Note: This transistor is sensitive to electrostatic discharge and should be handled with care.





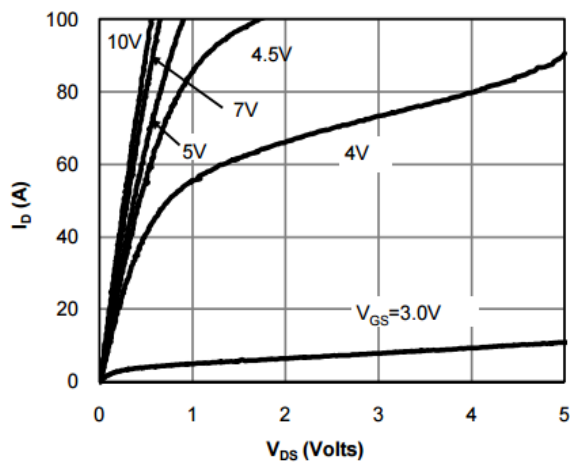
■ Electrical Characteristics (Tc=25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit	
Static Parameters							
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250uA	30	-	-	V	
Drain-Source Leakage Current	I _{DSS}	V _{DS} =30V, V _{GS} =0V	-	-	1	uA	
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA	
Gate Threshold Voltage	V _{GS(TH)}	V _{GS} =V _{DS} , I _D =250uA	1	1.4	2	V	
Drain-Source On Resistance	R _{DS(ON)}	V _{GS} =4.5V, I _D =15A	-	6	7	mΩ	
			Tj=125℃	-	9		-
		V _{GS} =10V, I _D =20A		-	4.5		5
			Tj=125℃	-	7		-
Dynamic Characteristics							
Input Capacitance	C _{iss}	V _{DS} =20V, V _{GS} =0V, f=1.0MHz	-	1500	-	pF	
Output Capacitance	C _{oss}		-	210	-	pF	
Reverse Transfer Capacitance	C _{rss}		-	165	-	pF	
Gate Resistance	R _g	V _{DS} =0V, V _{GS} =0V, f=1.0MHz	-	1.9	-	Ω	
Switching Paramters							
Total Gate Charge	Q _g	V _{DS} =25V, I _D =20A, V _{GS} =10V	-	16	-	nC	
Gate-Source Charge	Q _{gs}		-	5	-	nC	
Gate-Drain Charge	Q _{gd}		-	8	-	nC	
Source-Drain Characteristics							
Diode Forward Voltage	V _{sd}	V _{GS} =0V, I _S =10A	-	0.8	1.2	V	
Reverse Recovery Time	t _{rr}	V _R =15V, I _F =20A, di/dt=200A/us	-	26	-	ns	

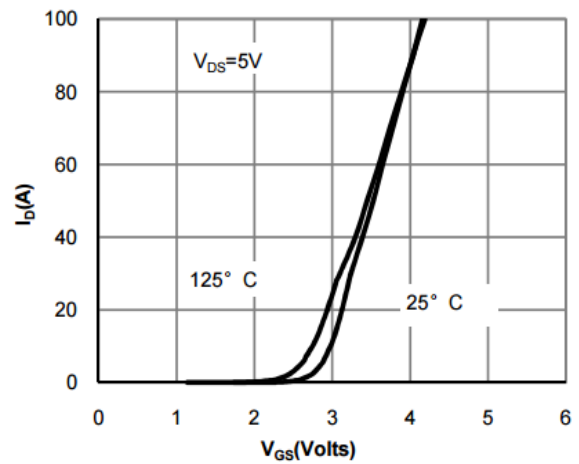




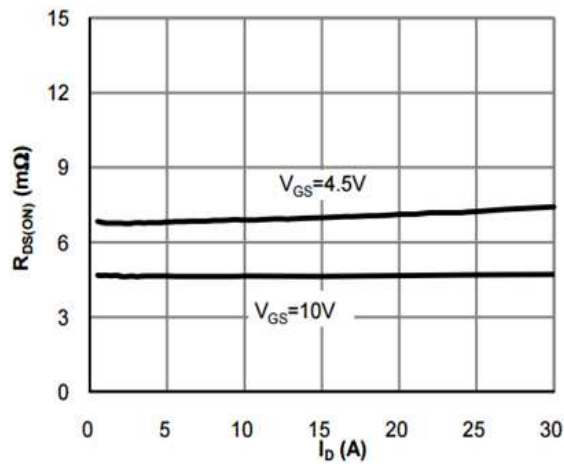
■ Characteristics Curves



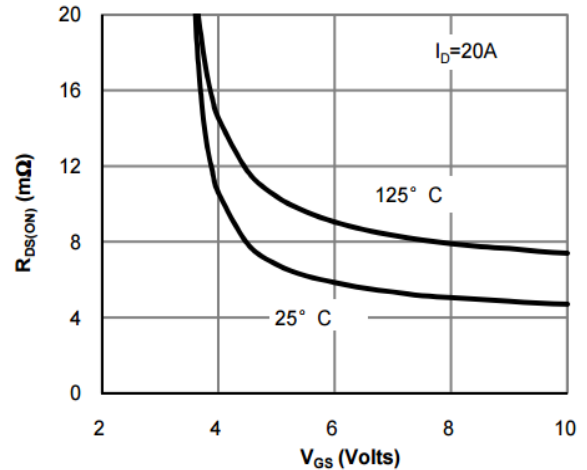
Output Characteristics



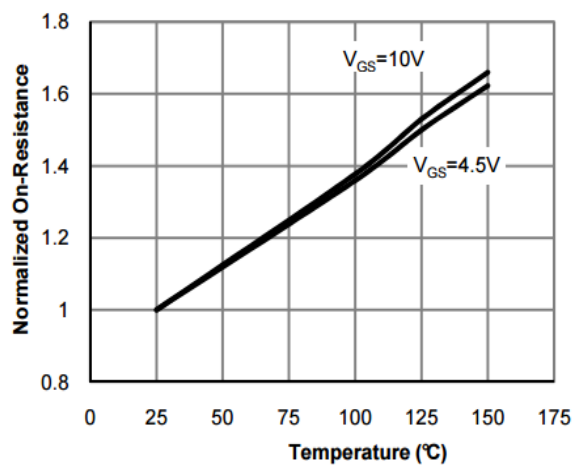
Transfer Characteristics



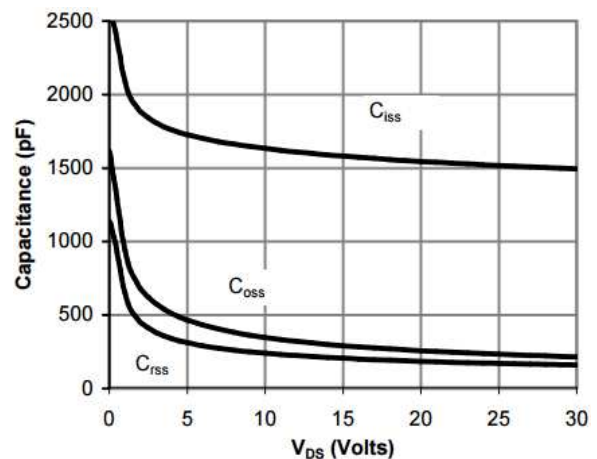
On Resistance Vs Drain Current



On Resistance Vs Gate Source Voltage

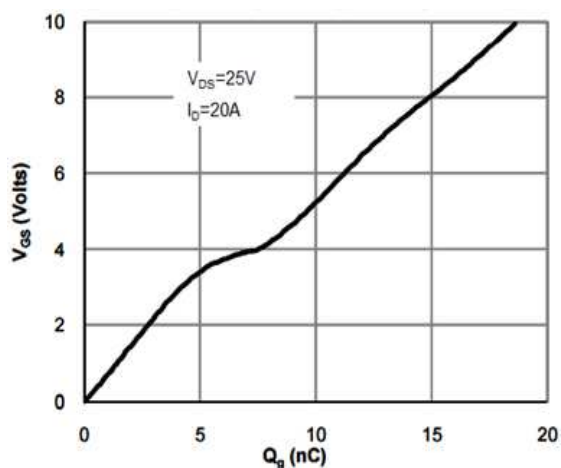


Rdson-JunctionTemperature

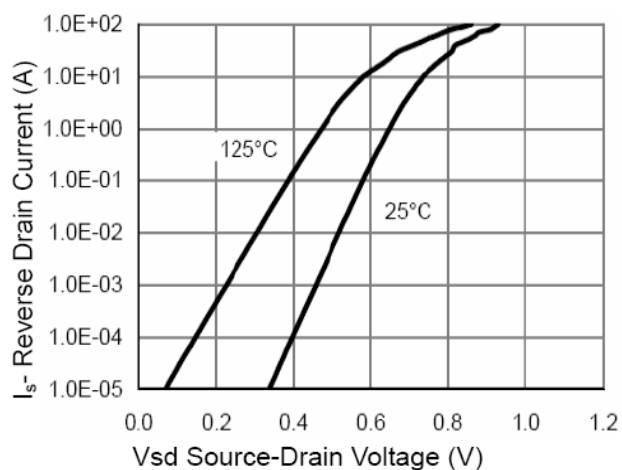


Capacitance

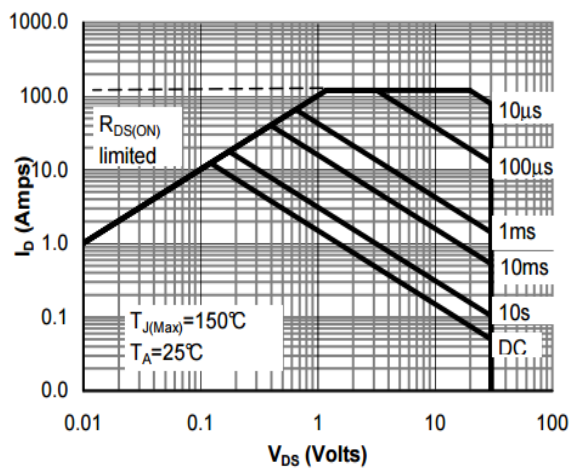




Gate Charge Waveform



Source-Drain Diode Forward Voltage



Maximum Safe Operating Area

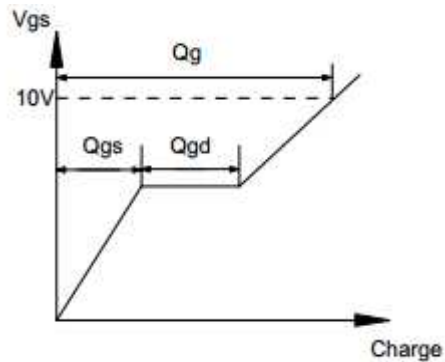
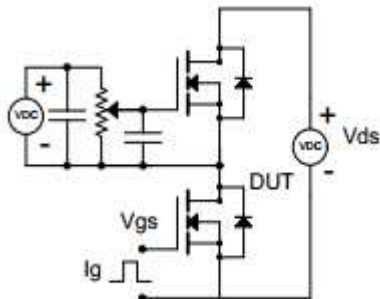
Note : The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.



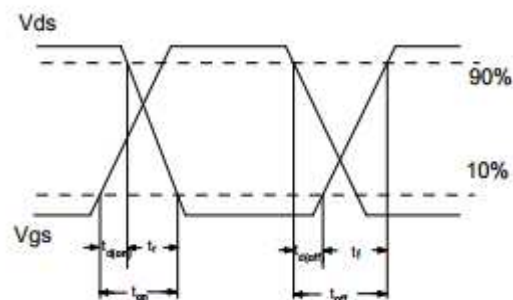
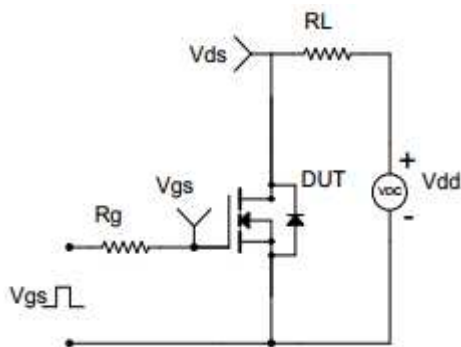


■ Test Circuit & Waveform

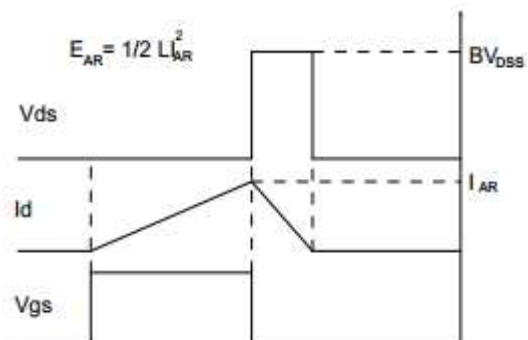
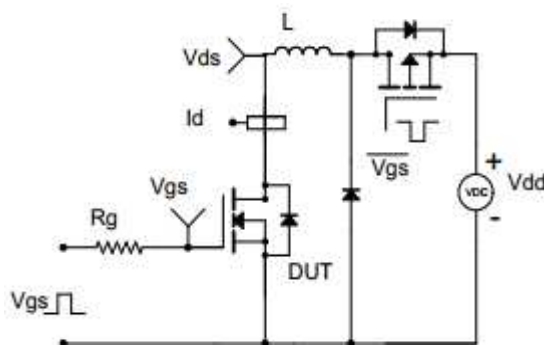
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveform



Unclamped Inductive Switching (UIS) Test Circuit & Waveform



**■ DFN5X6 Package Dimensions**

Unit: mm

Symbol	Min	Nom	Max	Symbol	Min	Nom	Max
A	0.90		1.10	k	1.15		1.35
A3	0.15		0.30	b	0.20		0.40
D	4.90		5.10	e	1.15		1.35
D1	3.90		4.10	L	0.50		0.65
D2	4.75		5.05	L1	0.43		0.55
E	5.85		6.15	H	0.55		0.68
E1	3.35		3.55	θ	8°		12°
E2	5.55		5.85				

