

» Applications

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

» Product Summary

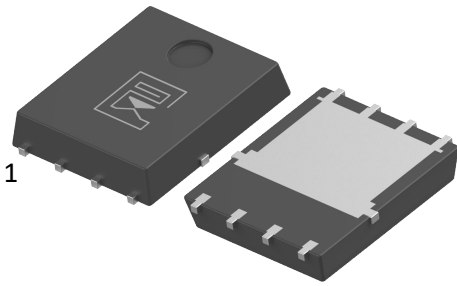
$V_{DS}$	30	V
$I_D$	352	A
$R_{DS(ON), Typ@10V}$	0.5	mΩ
$R_{DS(ON), Typ@4.5V}$	0.9	mΩ
$Q_g$	115	nC

» Features

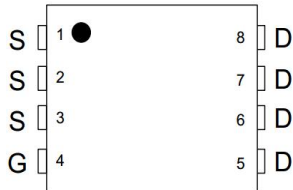
- High-Speed Switching
- Low  $R_{DS(ON)}$
- Enhanced Body diode dv/dt capability
- Enhanced Avalanche Ruggedness
- 100% UIS and RG Tested



### DFN5x6



1



S 1 ● 8 D  
S 2 7 D  
S 3 6 D  
G 4 5 D

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

» Package Marking and Ordering Information

Ordering code	Marking	Package	Packaging	Min. package quantity
MDG0D7R030SL	MDG0D7R030SL	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)	$I_D$	352	A
Continuous Drain Current Tc=100°C (Note 1)		220	A
Drain Current-Pulsed (Note 1)	$I_{DM}$	1400	A
Total Dissipation	$P_D$	138	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	$R_{\theta JC}$	0.9	°C/W
Maximum Junction-to-Ambient	$R_{\theta JA}$	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),  $L=0.5mH$ ,  $R_g=25\Omega$ .

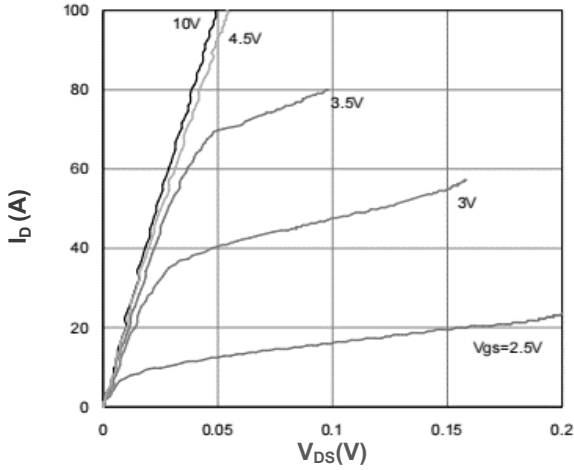
Note: This transistor is sensitive to electrostatic discharge and should be handled with care.

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

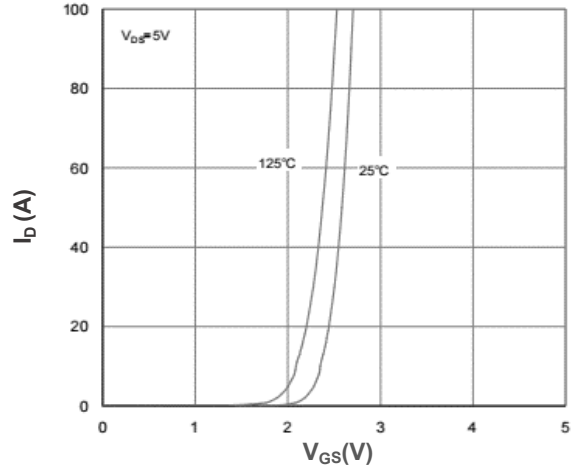
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static Parameters</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	30	-	-	V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=30V, V_{GS}=0V$	-	-	1	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	1.0	1.6	2.4	V
Drain-Source On Resistance	$R_{DS(ON)}$	$V_{GS}=4.5V, I_D=15A$	-	0.9	1.1	m $\Omega$
		$T_J=125^\circ C$	-	1.2	-	
		$V_{GS}=10V, I_D=20A$	-	0.5	0.7	
		$T_J=125^\circ C$	-	0.8	-	
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{ISS}$	$V_{DS}=15V, V_{GS}=0V,$ $f=1.0MHz$	-	6750	-	pF
Output Capacitance	$C_{OSS}$		-	3200	-	pF
Reverse Transfer Capacitance	$C_{RSS}$		-	140	-	pF
Gate Resistance	$R_g$	$V_{DS}=0V, V_{GS}=0V,$ $f=1.0MHz$	-	2.6	-	$\Omega$
<b>Switching Paramters</b>						
Turn-On Delay Time	$t_{d(on)}$	$V_{DS}=15V, I_D=20A,$ $V_{GS}=10V, R_G=3\Omega$	-	20	-	ns
Turn-On Rise Time	$t_r$		-	15	-	ns
Turn-Off Delay Time	$t_{d(off)}$		-	50	-	ns
Turn-Off Rise Time	$t_f$		-	8	-	ns
Total Gate Charge	$Q_g$	$V_{DS}=15V, I_D=20A,$ $V_{GS}=10V$	-	115	-	nC
Gate-Source Charge	$Q_{gs}$		-	11	-	nC
Gate-Drain Charge	$Q_{gd}$		-	25	-	nC
<b>Source-Drain Characteristics</b>						
Diode Forward Voltage	$V_{sd}$	$V_{GS}=0V, I_S=20A$	-	0.8	1.2	V
Reverse Recovery Time	$t_{rr}$	$V_R=15V, I_F=20A,$ $di/dt=100A/\mu s$	-	207	-	ns
Reverse Recovery Charge	$Q_{rr}$		-	0.5	-	$\mu C$



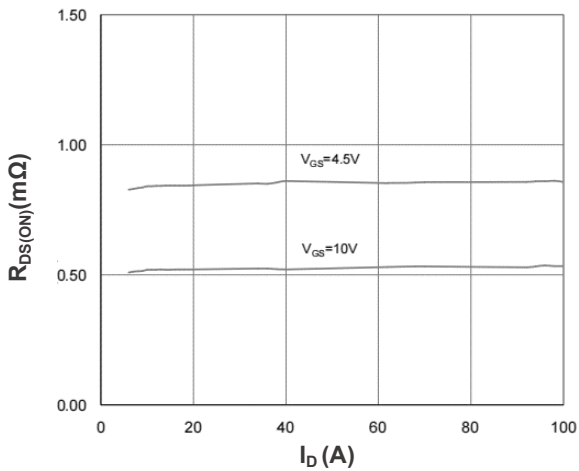
Characteristics Curves



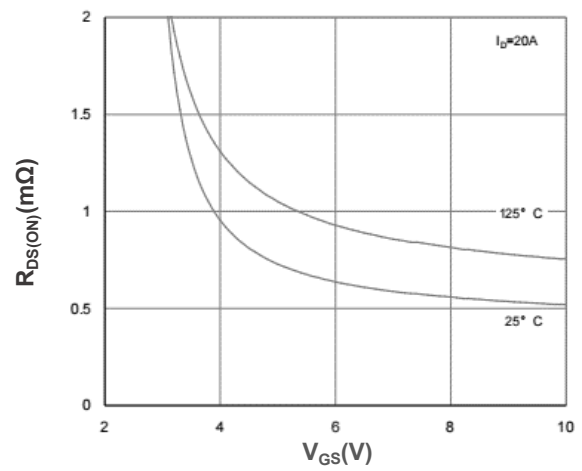
Output Characteristics



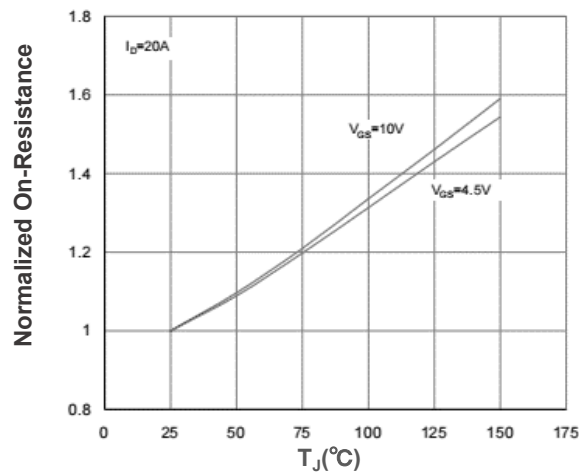
Transfer Characteristics



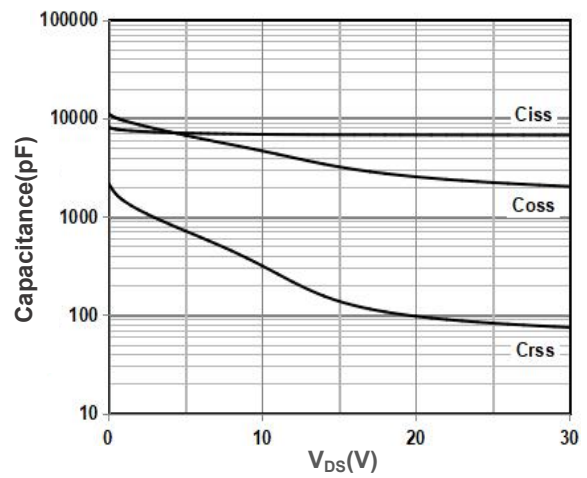
On Resistance Vs Drain Current



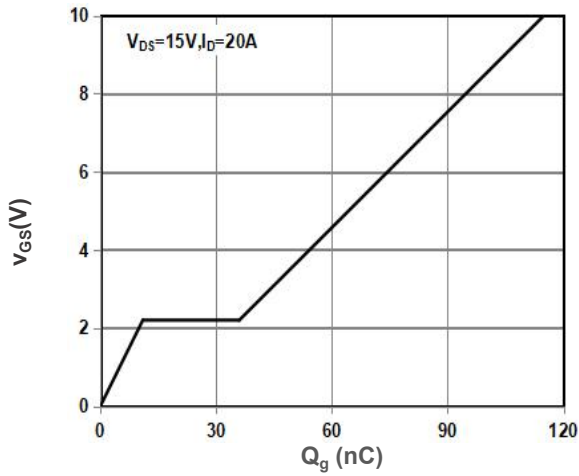
On Resistance Vs Gate Source Voltage



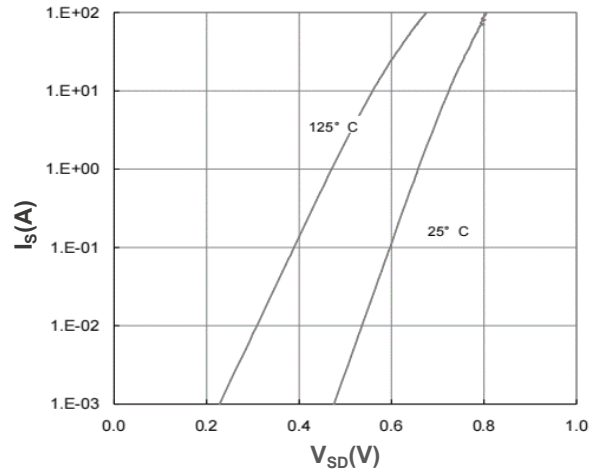
Rdson-JunctionTemperature



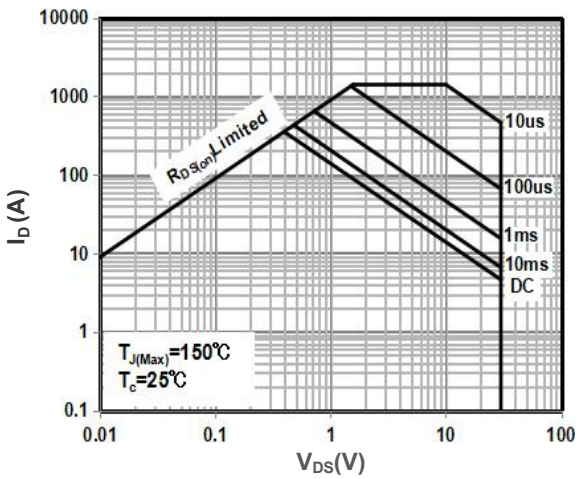
Capacitance



Gate Charge Waveform



Source-Drain Diode Forward Voltage



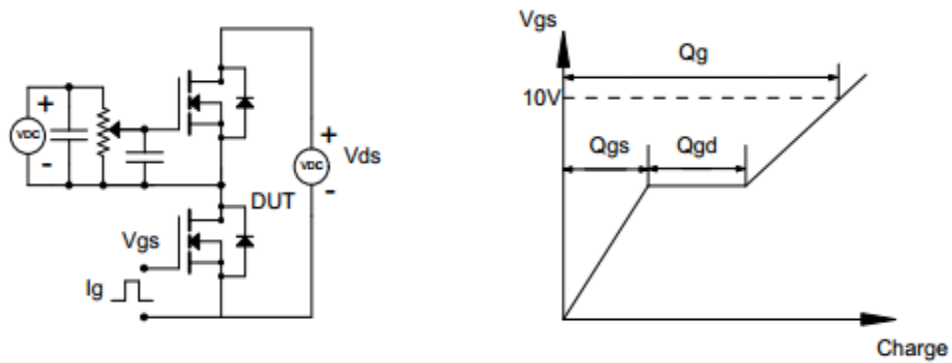
Maximum Safe Operating Area

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

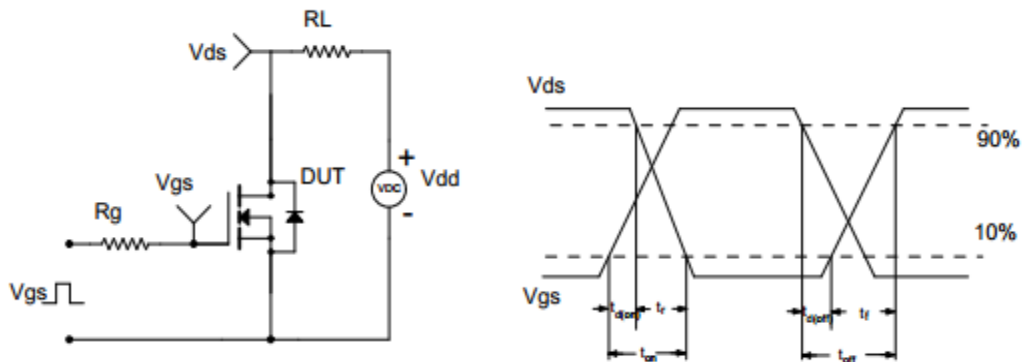


Test Circuit & Waveform

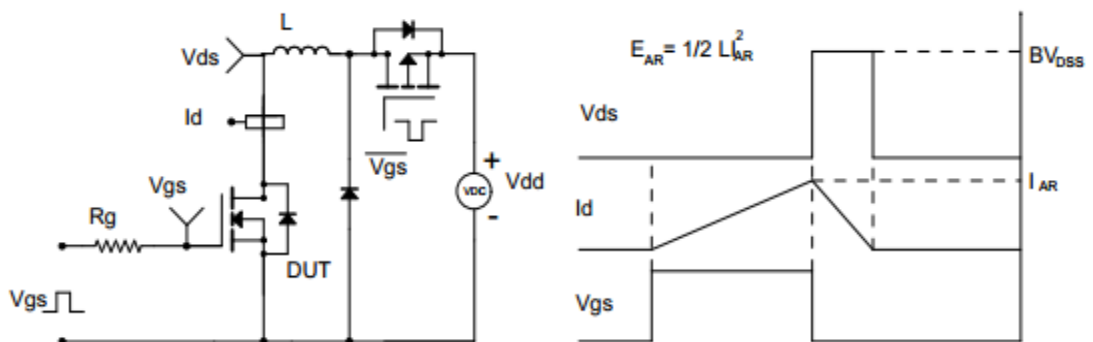
Gate Charge Test Circuit & Waveform



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	$\theta$	8°		12°
E2	5.55		5.85				

