

**MOSFETs Silicon 100V P-Channel MOS**
**■ Applications**

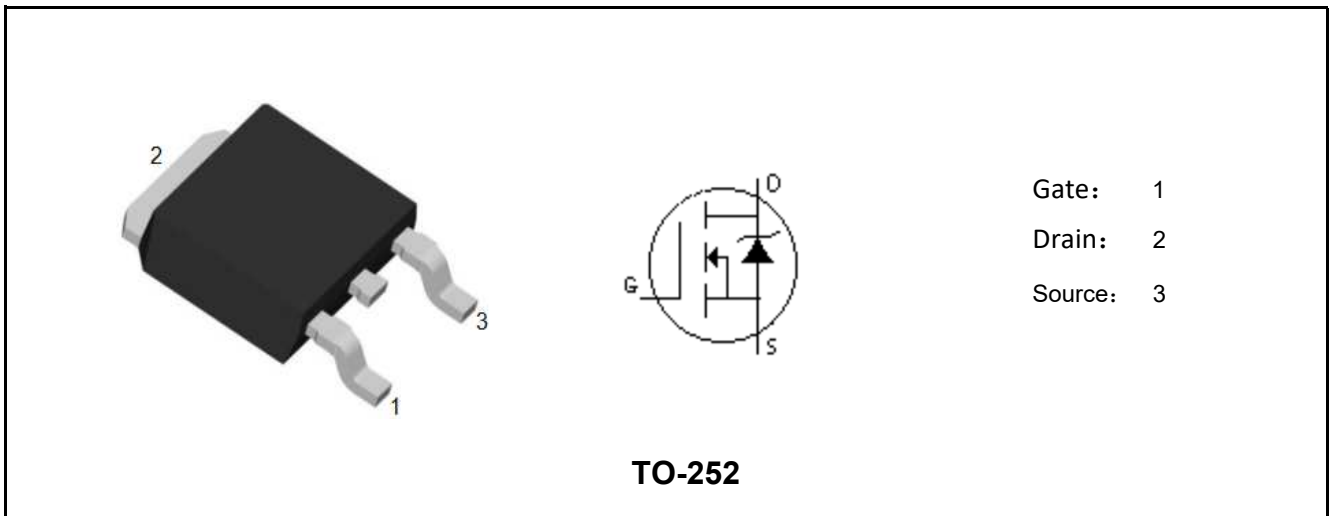
- Synchronous Rectification
- Industrial and Motor Drive
- DC/DC and AC/DC Converters
- Power Tools

**■ Features**

- High-Speed Switching
- Low gate charge
- low reverse transmission capacitance
- Improved dv/dt capability
- RoHS and Halogen-Free Compliant
- 100% UIS and RG Tested

**■ Product Summary**

$V_{DS}$	-100	V
$I_D$	-30	A
$R_{DS(ON), Typ@10V}$	40	m $\Omega$
$R_{DS(ON), Typ@4.5V}$	43	m $\Omega$
$Q_g$	80	nC



Marking	Package	Packaging	Min. package quantity
MK050P100TL	TO-252	Tape & Reel	3000



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

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	$V_{DS}$	-100	V
Gate-Source Voltage	$V_{GS}$	±20	V
Continuous Drain Current    Tc=25°C    (Note 1)	$I_D$	-30	A
Continuous Drain Current    Tc=100°C    (Note 1)		-20	A
Drain Current-Pulsed    (Note 1)	$I_{DM}$	-120	A
Total Dissipation	$P_D$	104	W
Junction Temperature	$T_J$	150	°C
Storage Temperature	$T_{stg}$	-55-150	°C
Single Pulse Avalanche Energy    (Note 2)	$E_{AS}$	290	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	$R_{\theta JC}$	1.2	°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:  $V_{DD}=50V$ ,  $T_{ch}=25^\circ C$ (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.



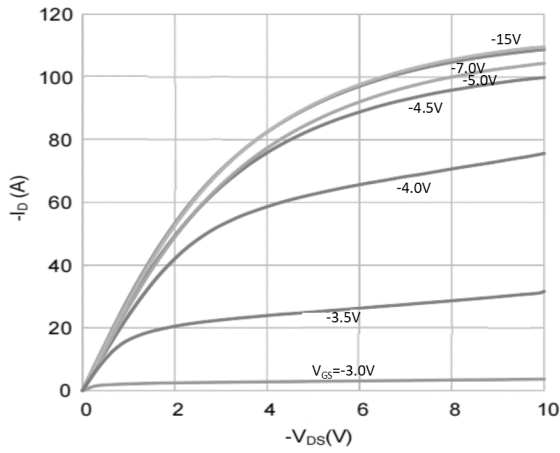
**■ Electrical Characteristics (Tc=25°C unless otherwise noted)**

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static Parameters</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-100	-	-	V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=-100V, V_{GS}=0V$	-	-	-1	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS}=V_{DS}, I_D=-250\mu A$	-1.5	-2	-2.5	V
Drain-Source On Resistance	$R_{DS(ON)}$	$V_{GS}=-4.5V, I_D=-15A$	-	43	55	m $\Omega$
		Tj=125°C	-	70	-	
		$V_{GS}=-10V, I_D=-20A$	-	40	50	
		Tj=125°C	-	66	-	
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=-35V, V_{GS}=0V,$ $f=1.0MHz$	-	4250	-	pF
Output Capacitance	$C_{oss}$		-	205	-	pF
Reverse Transfer Capacitance	$C_{rss}$		-	140	-	pF
Gate Resistance	$R_g$	$V_{DS}=0V, V_{GS}=0V,$ $f=1.0MHz$	-	11.4	-	$\Omega$
<b>Switching Paramters</b>						
Turn-On Delay Time	$t_{d(on)}$	$V_{DS}=-50V, I_D=-15A,$ $V_{GS}=-10V, R_G=10\Omega$	-	10	-	ns
Turn-On Rise Time	$t_r$		-	40	-	ns
Turn-Off Delay Time	$t_{d(off)}$		-	260	-	ns
Turn-Off Fall Time	$t_f$		-	90	-	ns
Total Gate Charge	$Q_g$	$V_{DS}=-50V, I_D=-15A,$ $V_{GS}=-10V$	-	80	-	nC
Gate-Source Charge	$Q_{gs}$		-	20	-	nC
Gate-Drain Charge	$Q_{gd}$		-	15	-	nC
<b>Source-Drain Characteristics</b>						
Diode Forward Voltage	$V_{sd}$	$V_{GS}=0V, I_S=-10A$	-	-0.8	-1.4	V
Reverse Recovery Time	$t_{rr}$	$V_R=-50V, I_F=-15A,$ $di/dt=-100A/\mu s$	-	30	-	ns
Reverse Recovery Charge	$Q_{rr}$		-	50	-	nC

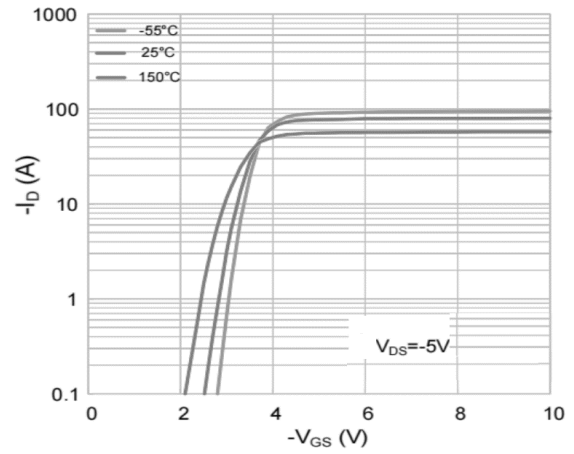




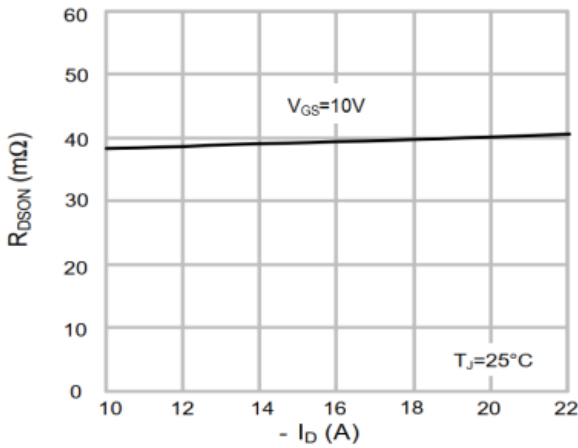
Characteristics Curves



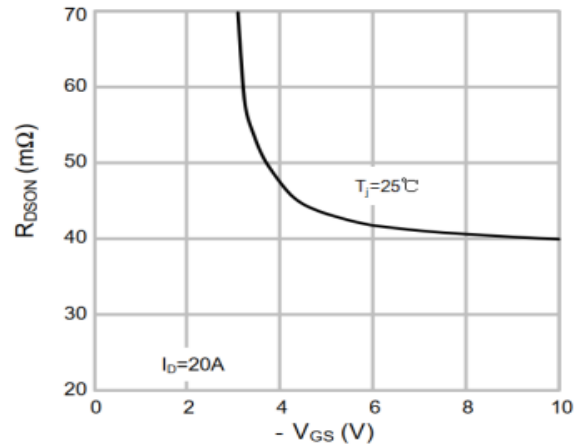
Output Characteristics



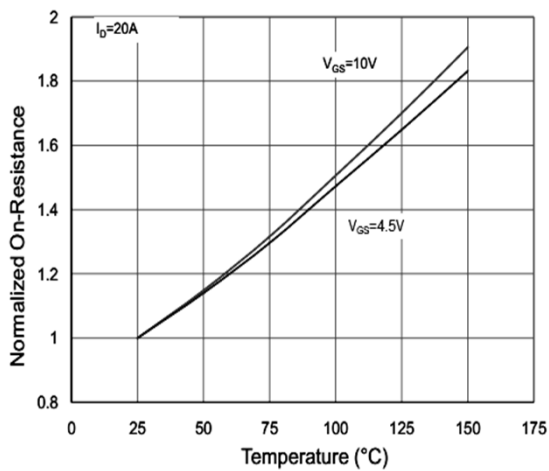
Transfer Characteristics



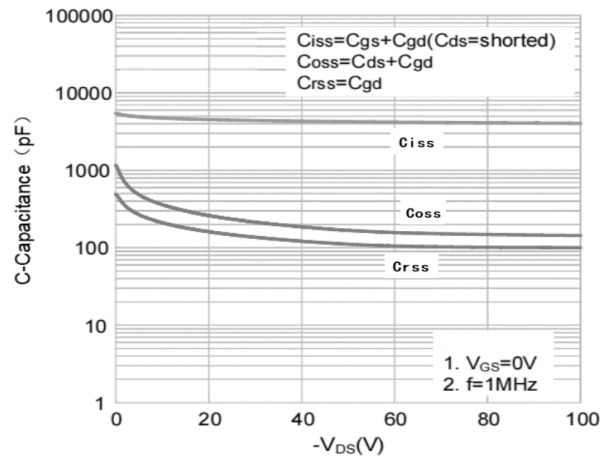
On Resistance Vs Drain Current



On Resistance Vs Gate Source Voltage

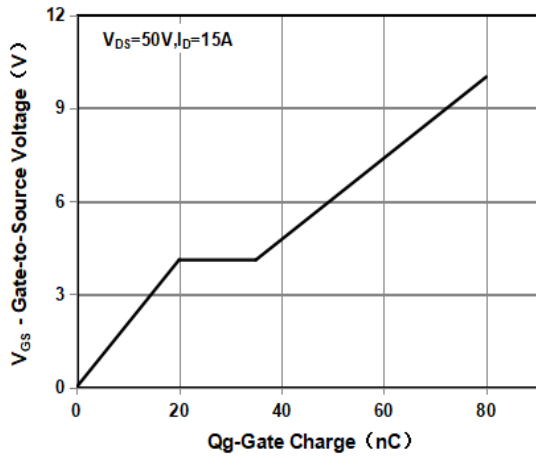


Rdson-JunctionTemperature

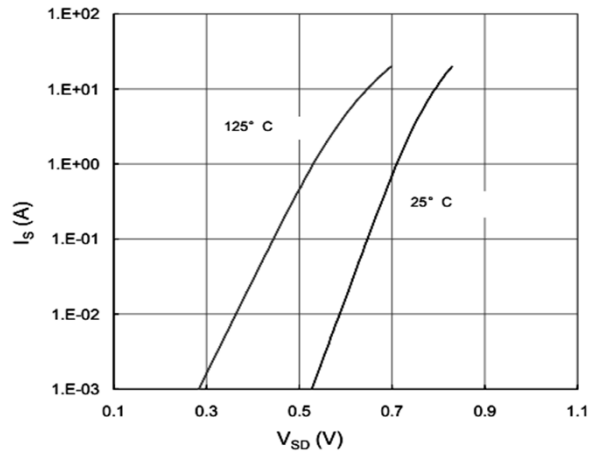


Capacitance

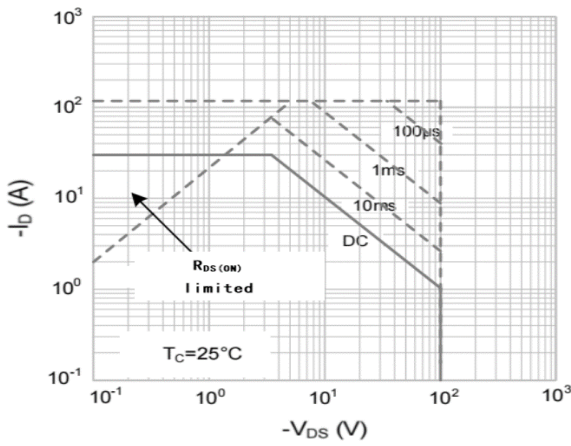




Gate Charge Waveform



Source-Drain Diode Forward Voltage



Maximum Safe Operating Area

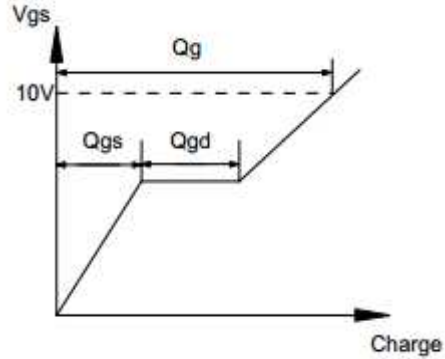
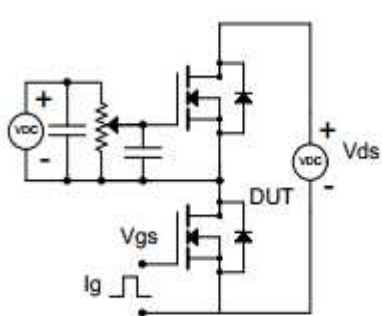
Note : The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.



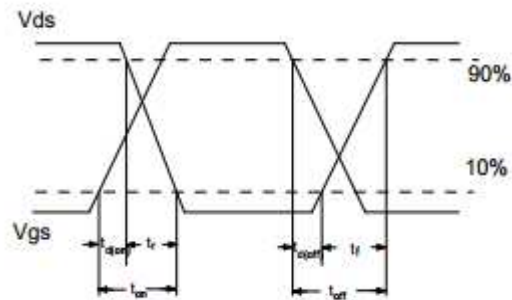
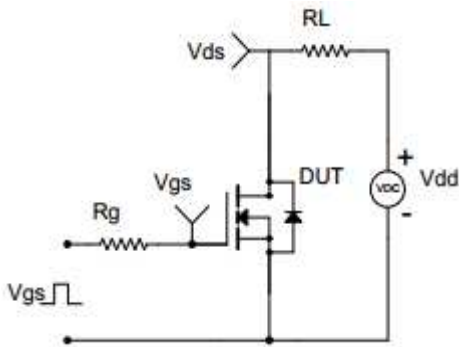


■ Test Circuit & Waveform

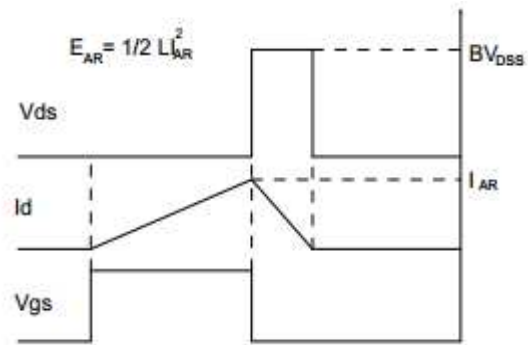
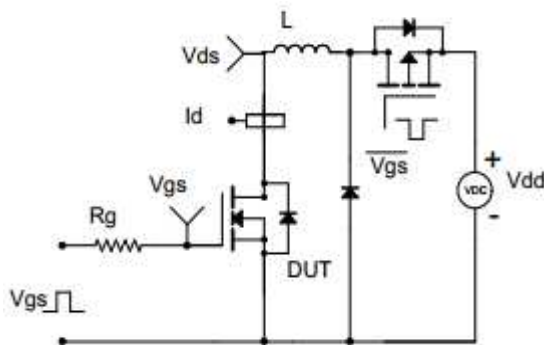
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveform



Unclamped Inductive Switching (UIS) Test Circuit & Waveform





■ TO-252 Package Dimensions

Unit: mm

Symbol	Min	Nom	Max	Symbol	Min	Nom	Max
A	2.10		2.50	E	5.80		6.30
B	0.80		1.25	e1	2.25	2.30	2.35
b	0.50		0.85	e2	4.45		4.75
b1	0.50		0.90	L1	9.50		10.20
b2	0.45		0.60	L2	0.90		1.45
C	0.45		0.60	L3	0.60		1.10
D	6.35		6.75	K	-0.1		0.10
D1	5.10		5.50				

