

Single P-Channel Enhancement Mode MOSFET

$V_{DS}=-100V$, $I_D=-13A$, $R_{DS(ON)}=158m\Omega$

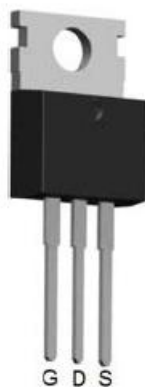
DESCRIPTION

- ◆ The OR01P13 uses advanced trench MOSFET technology to provide excellent $R_{DS(ON)}$ and gate charge for use in a wide variety of other applications. The OR01P13 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

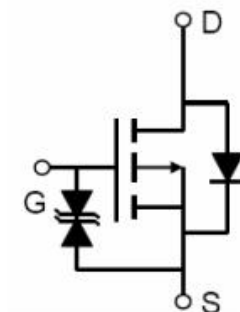
FEATURE

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

PIN CONFIGURATION



To-220 Top View



Schematic diagram

■ ABSOLUTE MAXIMUM RATINGS ($T_A=25^{\circ}\text{C}$ Unless otherwise noted)

Symbol	Parameter	Typical	Unit
V_{DSS}	Drain-Source Voltage	-100	V
V_{GSS}	Gate-Source Voltage	+20	V
I_D	Continuous Drain Current($T_J=150^{\circ}\text{C}$)	$V_{GS}=-10\text{V}$	A
I_{DM}	Pulsed Drain Current	-52	A
T_J	Operation Junction Temperature	-55~150	$^{\circ}\text{C}$
T_{STG}	Storage Temperature Range	-55~150	$^{\circ}\text{C}$
P_D	Power Dissipation($T_C=25^{\circ}\text{C}$)	42	W
E_{AS}	Single Pulse Avalanche Energy ($T_J=25^{\circ}\text{C}, V_{DD}=50\text{V}, V_{GS}=10\text{V}, R_G=25\Omega, L=0.5\text{mH}$)	68	mJ
$R_{\theta JC}$	Thermal Resistance-Junction to Ambient	3.13	$^{\circ}\text{C}/\text{W}$

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

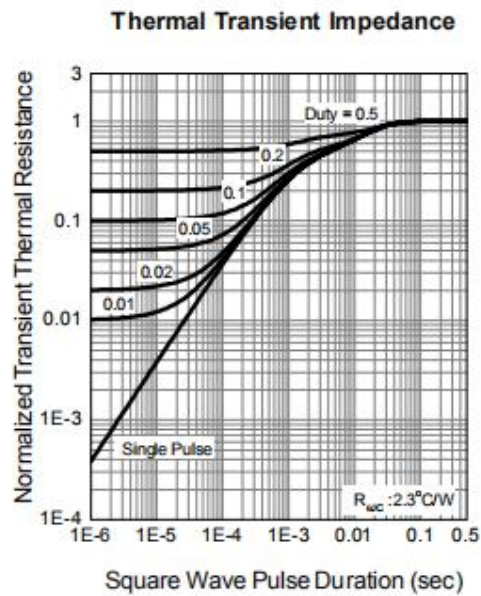
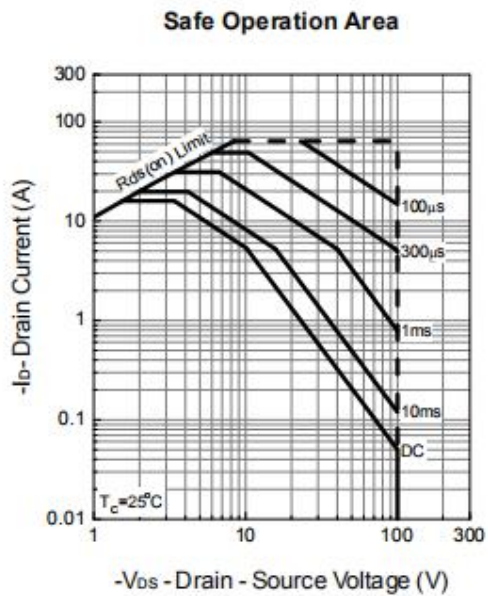
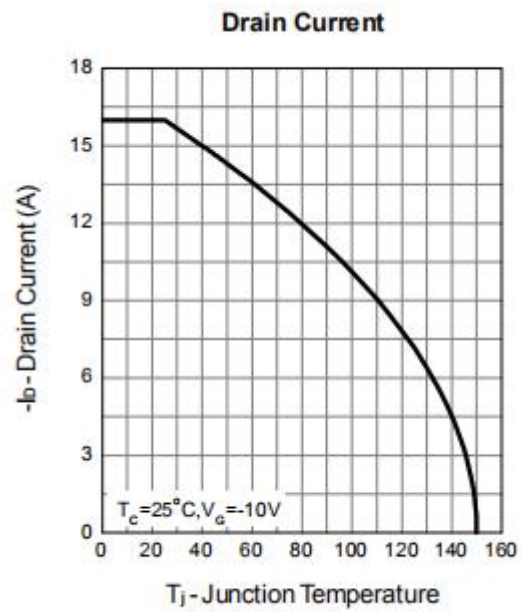
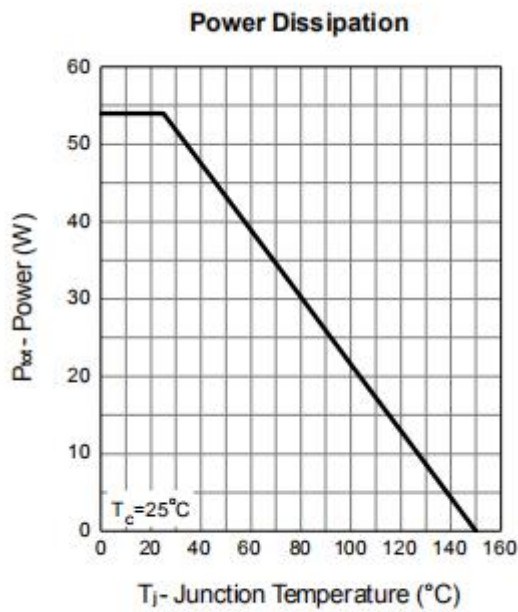
■ ELECTRICAL CHARACTERISTICS ($T_A=25^{\circ}\text{C}$ Unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0\text{V}, I_{DS}=-250\mu\text{A}$	-100	-	-	V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=-250\mu\text{A}$	-1	-1.9	-3	V
I_{GSS}	Gate Leakage Current	$V_{DS}=0\text{V}, V_{GS}=\pm 20\text{V}$	-	-	± 10	nA
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=-100\text{V}, V_{GS}=0\text{V}$ $T_C=25^{\circ}\text{C}$	-	-	1	μA
		$V_{DS}=-100\text{V}, V_{GS}=0\text{V}$ $T_C=125^{\circ}\text{C}$	-	-	± 10	μA
$R_{DS(ON)}$	Drain-Source On-Resistance	$V_{GS}=-10\text{V}, I_{DS}=-13\text{A}$	-	158	180	m Ω
Source-Drain Diode						
I_S	Diode Forward Current (Max.)		-	-	-13	A
V_{SD}	Diode Forward Voltage	$I_S=-10\text{A}, V_{GS}=0\text{V}$		-	-1.2	V
Dynamic Parameters						
Q_g	Total Gate Charge	$V_{DS}=-50\text{V}, V_{GS}=-10\text{V}$ $I_D=-10\text{A}$	-	25	-	nC
Q_{gs}	Gate-Source Charge		-	5	-	
Q_{gd}	Gate-Drain Charge		-	7	-	
C_{iss}	Input Capacitance	$V_{DS}=-25\text{V}, V_{GS}=0\text{V}$ $F=1\text{MHz}$	-	1160	-	pF
C_{oss}	Output Capacitance		-	360	-	
C_{rss}	Reverse Transfer Capacitance		-	170	-	
$t_{d(on)}$	Turn-On Time	$V_{DS}=-50\text{V}, I_D=-10\text{A}$ $V_{GS}=-10\text{V}, R_G=9.1\Omega$	-	14	-	nS
t_r			-	18	-	
$t_{d(off)}$	Turn-Off Time		-	50	-	
t_f			-	18	-	

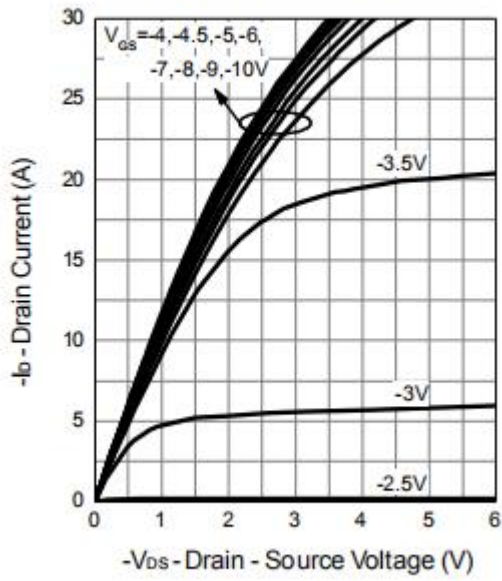
Note: 1. Pulse test: pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$;

2. Static parameters are based on package level with recommended wire-bonding

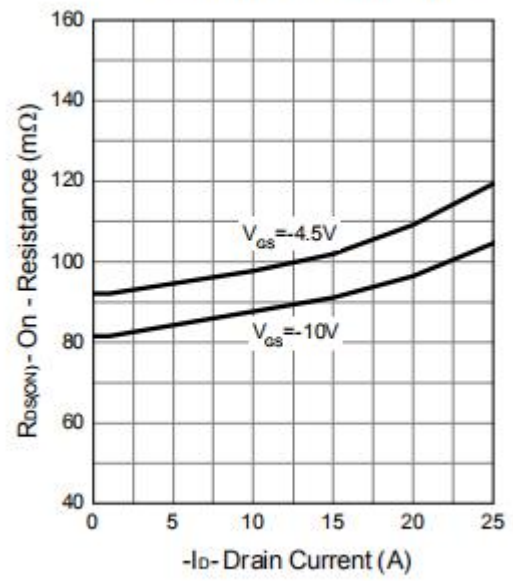
■ **TYPICAL CHARACTERISTICS** ($T_A=25^{\circ}C$ Unless otherwise noted) (Continue)



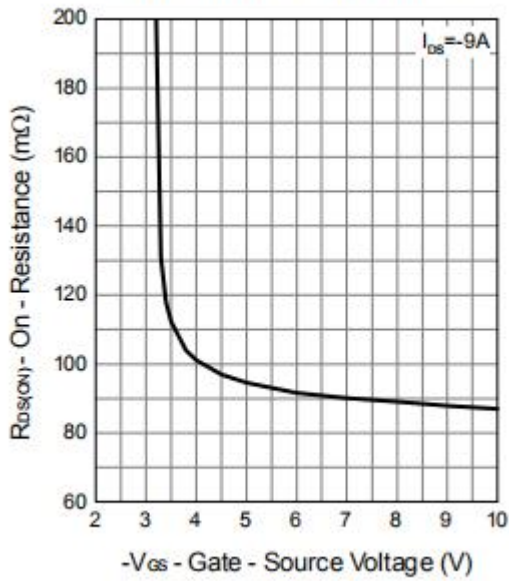
Output Characteristics



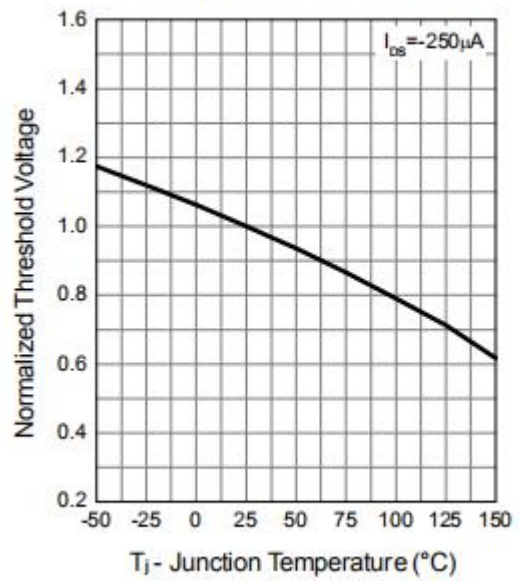
Drain-Source On Resistance



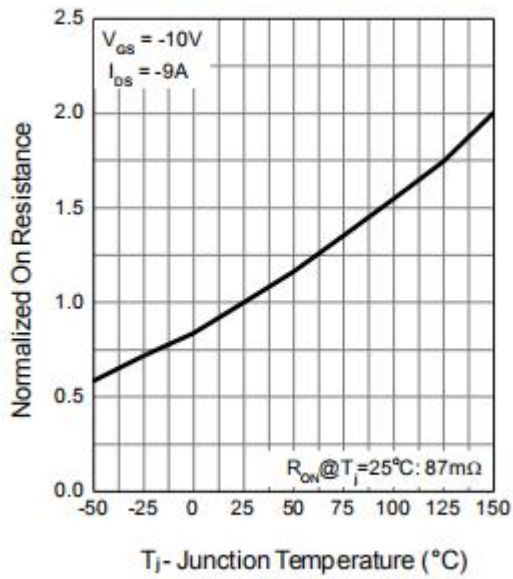
Gate-Source On Resistance



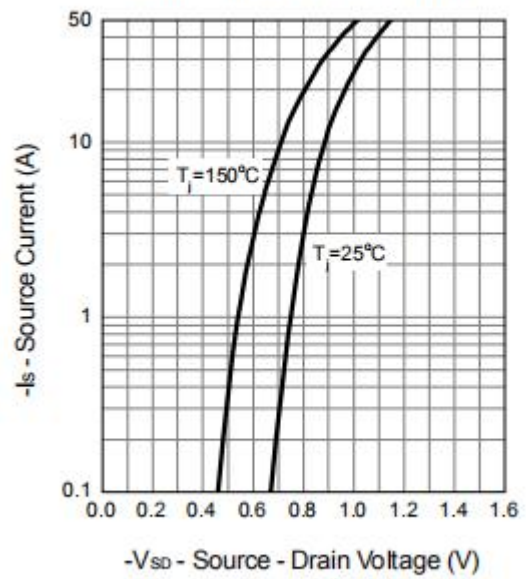
Gate Threshold Voltage



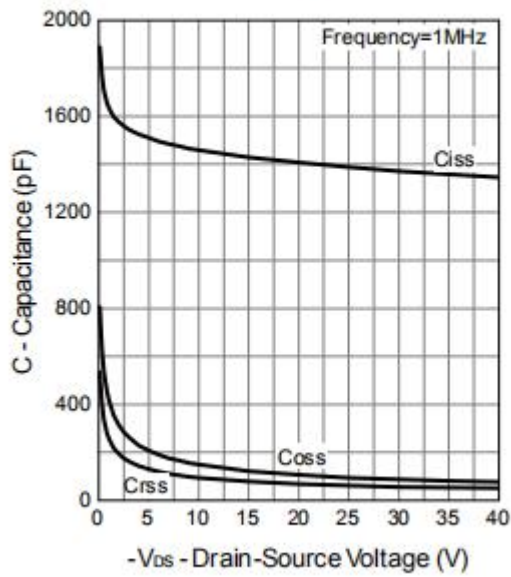
Drain-Source On Resistance



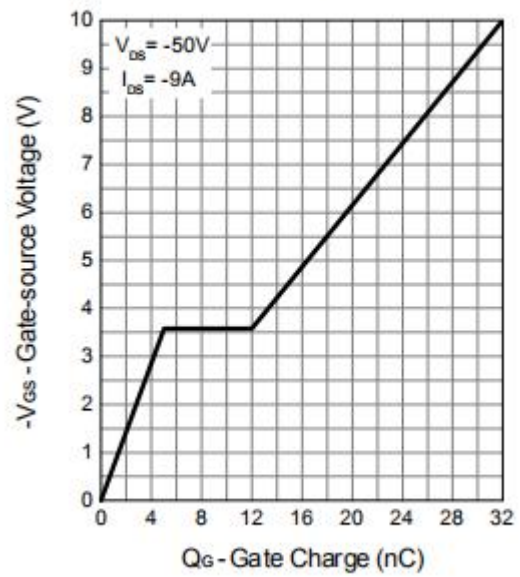
Source-Drain Diode Forward

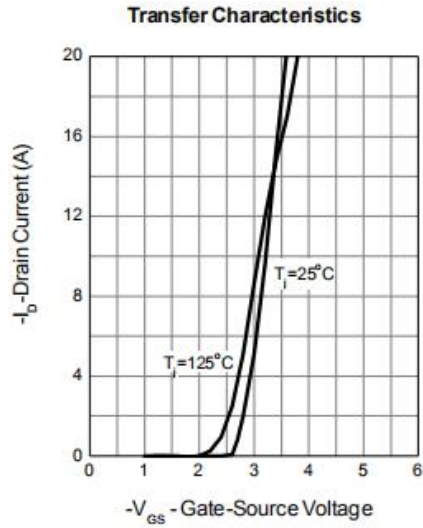


Capacitance

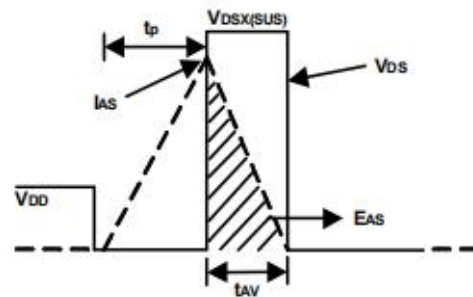
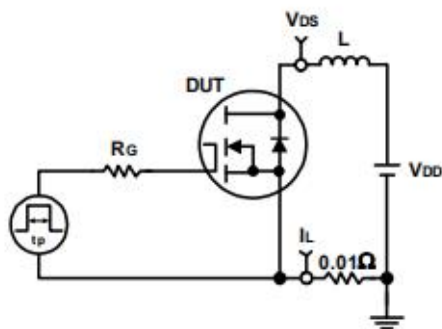


Gate Charge

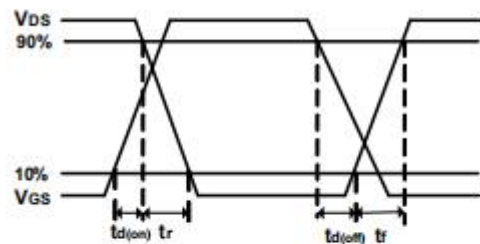
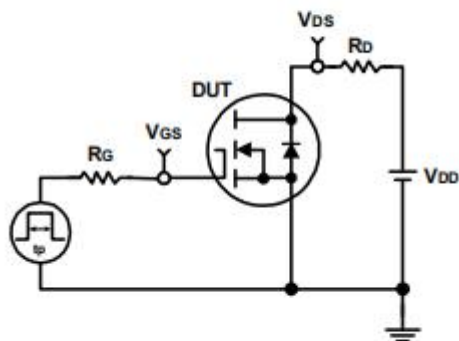




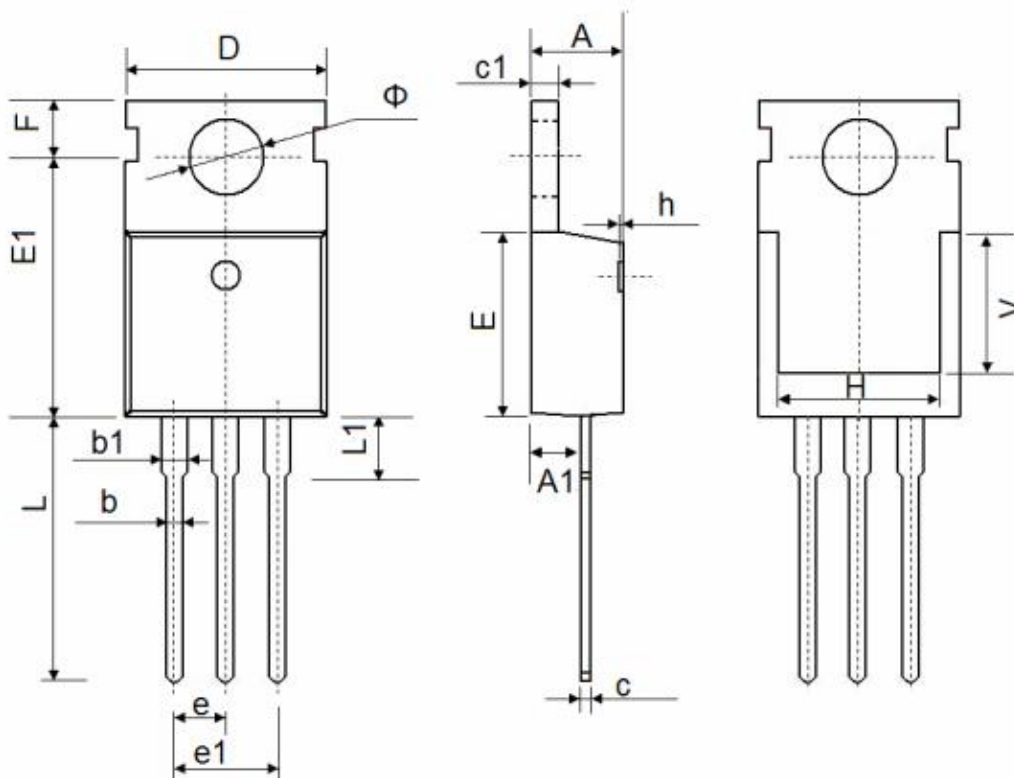
Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms



TO-220-3L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181
A1	2.250	2.550	0.089	0.100
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	9.910	10.250	0.390	0.404
E	8.9500	9.750	0.352	0.384
E1	12.650	12.950	0.498	0.510
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
H	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.900	13.400	0.508	0.528
L1	2.850	3.250	0.112	0.128
V	7.500 REF.		0.295 REF.	
Φ	3.400	3.800	0.134	0.150