

## P-Channel 40 V (D-S) MOSFEET

### PRODUCT SUMMARY

V <sub>DS</sub> (V)	R <sub>DS(on)</sub> (mΩ)	I <sub>D</sub> (A)
- 40	3.5 at V <sub>GS</sub> = - 10 V	- 100 <sup>d</sup>
	5 at V <sub>GS</sub> = - 4.5 V	- 85 <sup>d</sup>

### FEATURES

- DT-Trench Power MOSFET
- 100 % Rg and UIS Tested

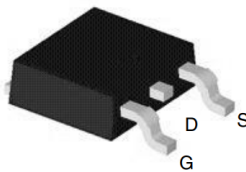
### APPLICATIONS

- Load Switch
- DC/DC Converter

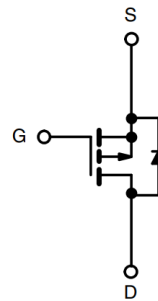


RoHS  
COMPLIANT

TO-252 Pin Configuration



Top View



P-Channel MOSFET

### ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = 25 °C, unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V <sub>DS</sub>	- 40	V
Gate-Source Voltage	V <sub>GS</sub>	± 20	
Continuous Drain Current (T <sub>J</sub> = 175 °C)	I <sub>D</sub>	T <sub>C</sub> = 25 °C	- 100 <sup>d</sup>
		T <sub>C</sub> = 125 °C	- 65
Pulsed Drain Current	I <sub>DM</sub>	- 380	A
Avalanche Current single pulse	I <sub>AS</sub>	- 95	
Avalanche Energy single pulse <sup>a</sup>	E <sub>AS</sub>	75	mJ
Power Dissipation	P <sub>D</sub>	T <sub>C</sub> = 25 °C	128 <sup>c</sup>
		T <sub>A</sub> = 25 °C	4.1 <sup>b, c</sup>
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	- 55 to 150	°C

### THERMAL RESISTANCE RATINGS

Parameter	Symbol	Typical	Maximum	Unit
Junction-to-Ambient <sup>b</sup>	R <sub>thJA</sub>	t ≤ 10 s	18	30
		Steady State	35	60
Junction-to-Case	R <sub>thJC</sub>	-	2.0	°C/W

Notes:

- Duty cycle ≤ 1 %.
- When mounted on 1" square PCB (FR-4 material).
- See SOA curve for voltage derating.
- Package limited.

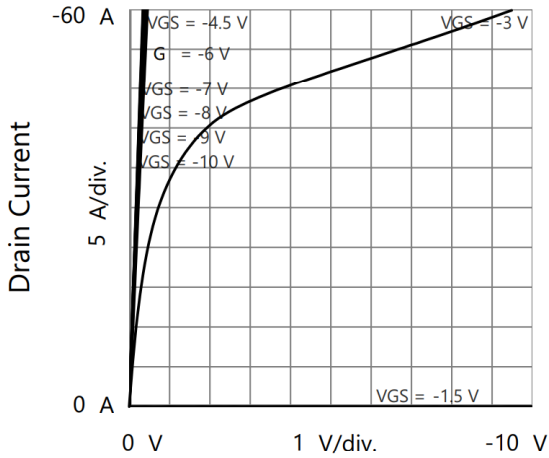
<b>SPECIFICATIONS</b> ( $T_J = 25\text{ }^\circ\text{C}$ , unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{DS}$	$V_{GS} = 0\text{ V}, I_D = -250\text{ }\mu\text{A}$	- 40			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\text{ }\mu\text{A}$	- 1		- 3	V
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -40\text{ V}, V_{GS} = 0\text{ V}$			- 1	$\mu\text{A}$
		$V_{DS} = -32\text{ V}, V_{GS} = 0\text{ V}, T_J = 125\text{ }^\circ\text{C}$			- 50	
		$V_{DS} = -32\text{ V}, V_{GS} = 0\text{ V}, T_J = 150\text{ }^\circ\text{C}$			- 100	
On-State Drain Current <sup>a</sup>	$I_{D(on)}$	$V_{DS} = -5\text{ V}, V_{GS} = -10\text{ V}$	- 100			A
Drain-Source On-State Resistance <sup>a</sup>	$R_{DS(on)}$	$V_{GS} = -10\text{ V}, I_D = -30\text{ A}$		3.5	4.8	m $\Omega$
		$V_{GS} = -4.5\text{ V}, I_D = -20\text{ A}$		5	6.5	
Forward Transconductance <sup>a</sup>	$g_{fs}$	$V_{DS} = -5\text{ V}, I_D = -30\text{ A}$		89		S
<b>Dynamic<sup>b</sup></b>						
Input Capacitance	$C_{iss}$	$V_{GS} = 0\text{ V}, V_{DS} = -20\text{ V}, f = 1\text{ MHz}$		8103		pF
Output Capacitance	$C_{oss}$			567		
Reverse Transfer Capacitance	$C_{rss}$			405		
Total Gate Charge <sup>c</sup>	$Q_g$	$V_{DS} = -20\text{ V}, V_{GS} = -10\text{ V}, I_D = -30\text{ A}$		52		nC
Gate-Source Charge <sup>c</sup>	$Q_{gs}$			33		
Gate-Drain Charge <sup>c</sup>	$Q_{gd}$			15		
Turn-On Delay Time <sup>c</sup>	$t_{d(on)}$	$V_{DD} = -20\text{ V}, R_L = 0.6\text{ }\Omega$ $I_D \approx -30\text{ A}, V_{GEN} = -10\text{ V}, R_G = 6\text{ }\Omega$		39		ns
Rise Time <sup>c</sup>	$t_r$			20		
Turn-Off Delay Time <sup>c</sup>	$t_{d(off)}$			72		
Fall Time <sup>c</sup>	$t_f$			57		
<b>Source-Drain Diode Ratings and Characteristics</b> $T_C = 25\text{ }^\circ\text{C}^b$						
Continuous Current	$I_S$				-100	A
Forward Voltage <sup>a</sup>	$V_{SD}$	$I_F = -1\text{ A}, V_{GS} = 0\text{ V}$		- 0.7	- 1.0	V
Reverse Recovery Time	$t_{rr}$	$I_F = -30\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		50		ns
Reverse Recovery Charge	$Q_{rr}$	$I_F = -30\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		63		nC

Notes:

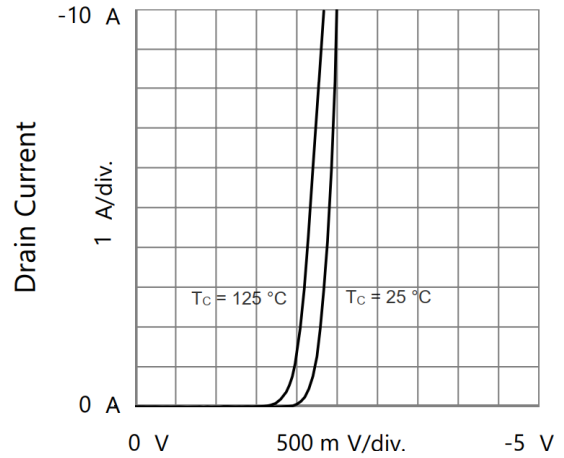
- Pulse test; pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$ .
- Guaranteed by design, not subject to production testing.
- Independent of operating temperature.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

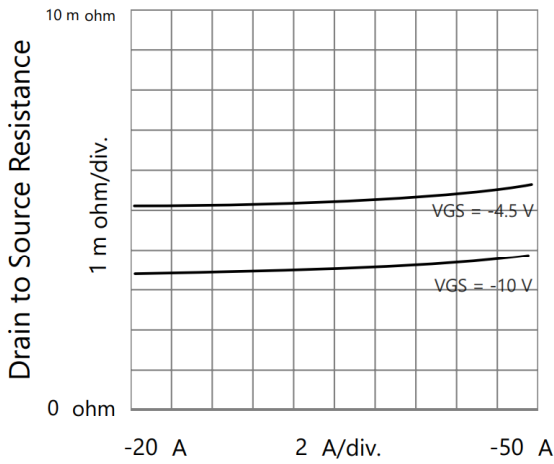
**TYPICAL CHARACTERISTICS** (25 °C, unless otherwise noted)



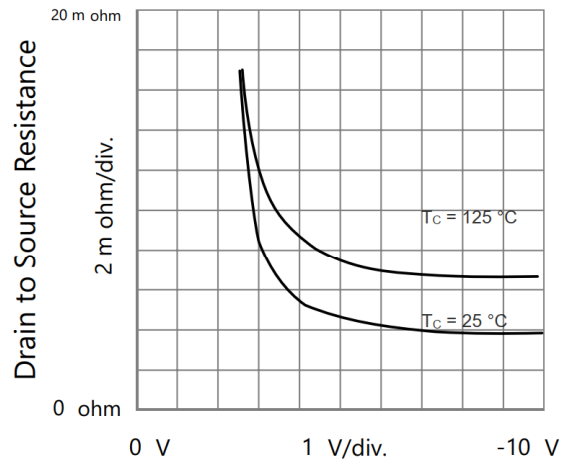
Drain to Source Voltage  
Output Characteristics



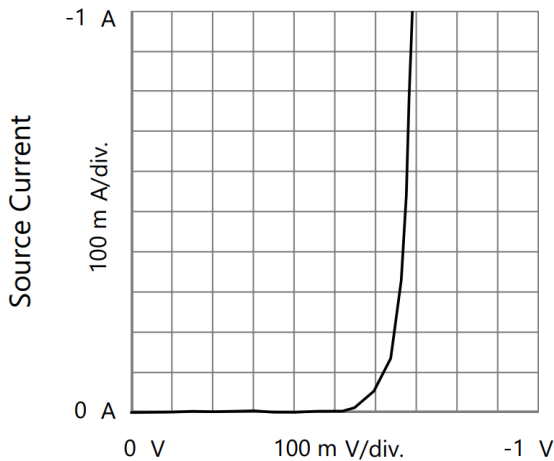
Gate to Source Voltage  
Transfer Characteristics



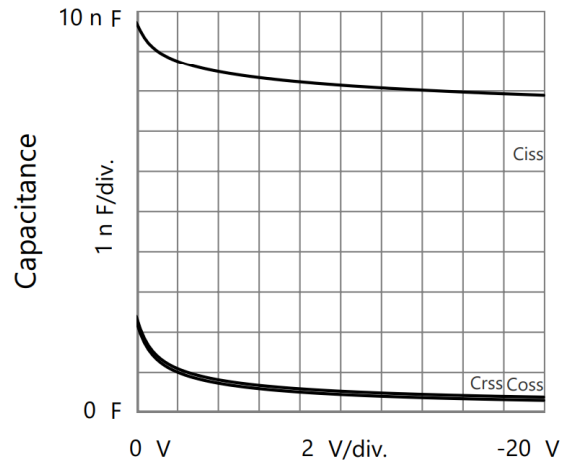
Drain Current  
Drain to Source Resistance vs. Drain Current



Gate to Source Voltage  
Drain to Source Resistance vs. Gate to Source Voltage

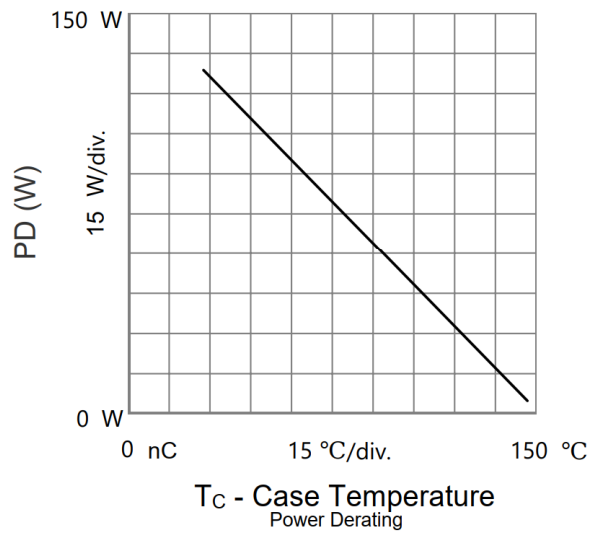
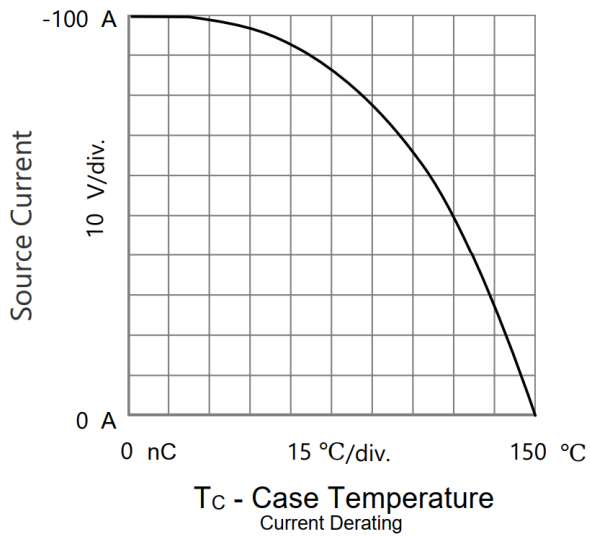
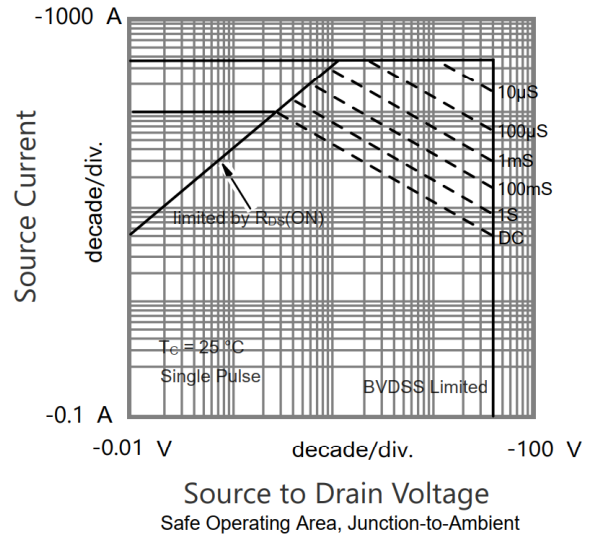
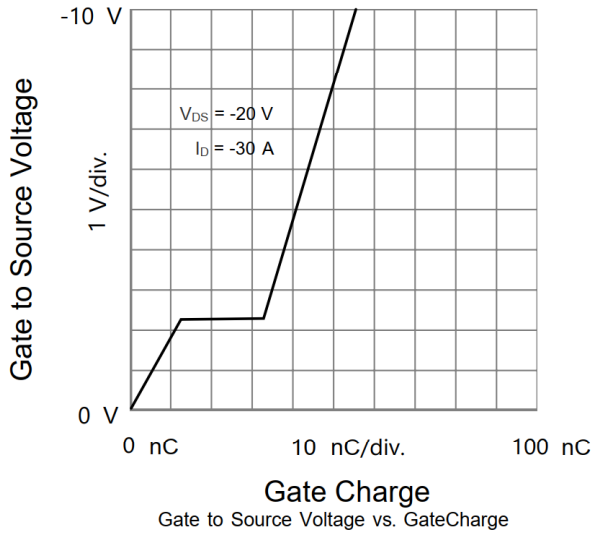


Source to Drain Voltage  
Body Diode Forward Characteristics

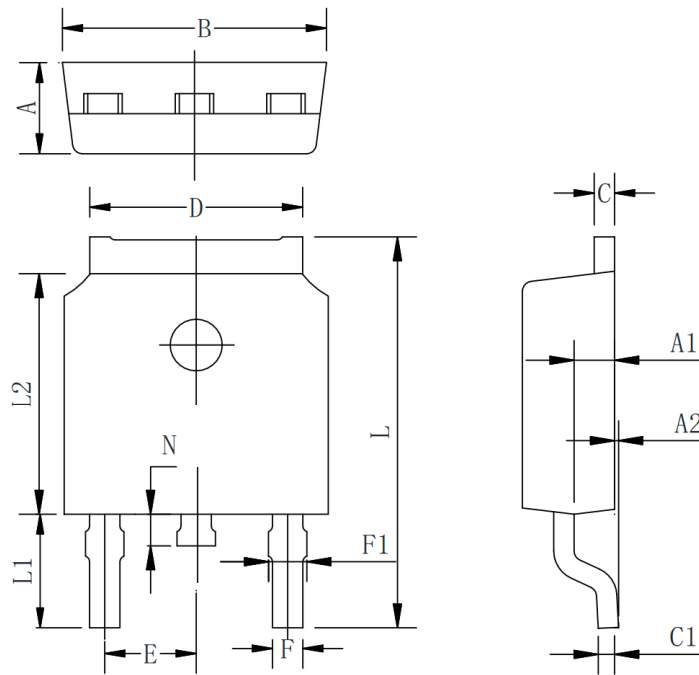


Drain to Source Voltage  
Capacitances

**TYPICAL CHARACTERISTICS** (25 °C, unless otherwise noted)



## TO-252-2L PACKAGE OUTLINE



COMMON DIMENSIONS  
(UNITS OF MEASURE=MILLIMETER)

Symbol	Min	Typ	Max
A	2.10	2.30	2.50
A1	0.88	1.01	1.16
A2	0.00	0.15	0.28
B	6.40	6.60	6.80
C	0.42	0.50	0.63
C1	0.42	0.50	0.63
D	5.08	5.32	5.65
E	2.286 TYP		
F	0.63	0.76	0.89
F1	0.64	0.86	1.08
L	9.30	9.90	10.80
L1	2.4	2.8	3.6
L2	5.90	6.10	6.55
N	0.57	0.80	1.05

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