P-Channel 40 V (D-S) MOSFET

RoHS COMPLIANT

PRODUCT SUMMARY			
V_{DS} (V)	$R_{DS(on)}$ (mΩ)(Typ.)	I_D (A)[a]	Q_g (Typ.)
- 40	12.5 at V_{GS} = - 10 V	- 60	40 nC
	16 at V_{GS} = - 4.5 V		

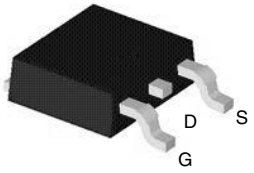
FEATURES

- DT-Trench Power MOSFET
- 100 % R_g and UIS Tested
- Excellent package for good heat dissipation

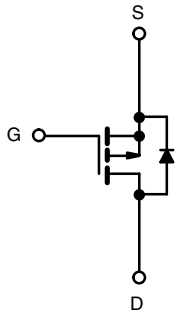
APPLICATIONS

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

TO-252 Pin Configuration



Top View



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_C = 25 °C, unless otherwise noted)				
PARAMETER		SYMBOL	LIMIT	UNIT
Drain-Source Voltage		V_{DS}	- 40	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current (T_J = 150 °C)[a]	T_C = 25 °C	I_D	- 60	A
	T_C = 100 °C		- 39.5	
Pulsed Drain Current[b]		I_{DM}	- 180	
Single Pulse Avalanche Energy		E_{AS}	110	mJ
Maximum Power Dissipation[c]	T_C = 25 °C	P_D	73.5	W
	T_C = 100 °C		29.4	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to +150	°C

THERMAL RESISTANCE RATINGS				
PARAMETER		SYMBOL	LIMIT	UNIT
Junction-to-Ambient	PCB mount [d]	R_{thJA}	50	°C/W
Junction-to-Case		R_{thJC}	1.7	

Notes

a. Calculated continuous current based on maximum allowablejunction temperature.
b. Repetitive rating; pulse width limited by max. junction temperature.
c. Pd is based on max. junction temperature, using junction-case thermal resistance.
d. The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper,in a still air environment with Ta=25 °C.

SPECIFICATIONS (T_J = 25 °C, unless otherwise noted)						
Parameter	**Symbol**	**Test Conditions**	**Min.**	**Typ.**	**Max.**	**Unit**
Static						
Drain-Source Breakdown Voltage	V_{DS}	V_{GS} = 0 V, I_D = - 250 µA	- 40			V
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = - 250 µA	- 1		- 3	V
Gate-Source Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = - 40 V, V_{GS} = 0 V			- 1	µA
		V_{DS} = - 32 V, V_{GS} = 0 V, T_J = 55 °C			- 10	
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} = - 5 V, V_{GS} = - 10 V	- 60			A
Drain-Source On-State Resistance[a]	$R_{DS(on)}$	V_{GS} = - 10 V, I_D = - 20 A		12.5	15	mΩ
		V_{GS} = - 4.5 V, I_D = - 10 A		16	21	
Forward Transconductance[a]	g_{fs}	V_{DS} = - 5 V, I_D = - 20 A		45		S
Dynamic[b]						
Input Capacitance	C_{iss}	V_{DS} = - 20 V, V_{GS} = 0 V, f = 1 MHz		2560		pF
Output Capacitance	C_{oss}			207		
Reverse Transfer Capacitance	C_{rss}			197		
Total Gate Charge	Q_g	V_{DS} = - 20 V, V_{GS} = - 10 V, I_D = - 20 A		40		nC
Gate-Source Charge	Q_{gs}			7		
Gate-Drain Charge	Q_{gd}			8.5		
Gate Resistance	R_g	f = 1 MHz		3.2		Ω
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = - 20 V, I_D = - 20 A, V_{GEN} = - 10 V, R_g = 3 Ω		12		ns
Rise Time	t_r			20		
Turn-Off Delay Time	$t_{d(off)}$			40		
Fall Time	t_f			27		
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	T_C = 25 °C			- 60	A
Pulse Diode Forward Current[a]	I_{SM}				- 180	
Body Diode Voltage	V_{SD}	I_S = - 1 A			- 1.2	V
Body Diode Reverse Recovery Time	t_{rr}	I_F = - 20 A, di/dt = 100 A/µs, T_J = 25 °C		38		ns
Body Diode Reverse Recovery Charge	Q_{rr}			45		nC

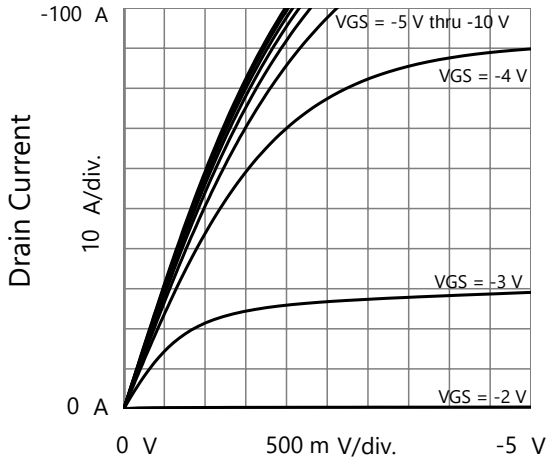
Notes:

a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.

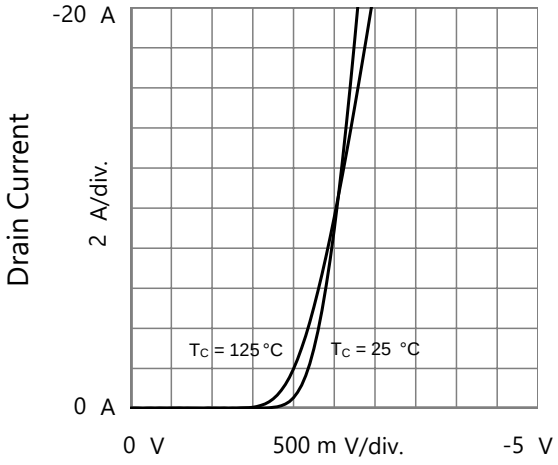
b. Guaranteed by design, not subject to production testing.

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.

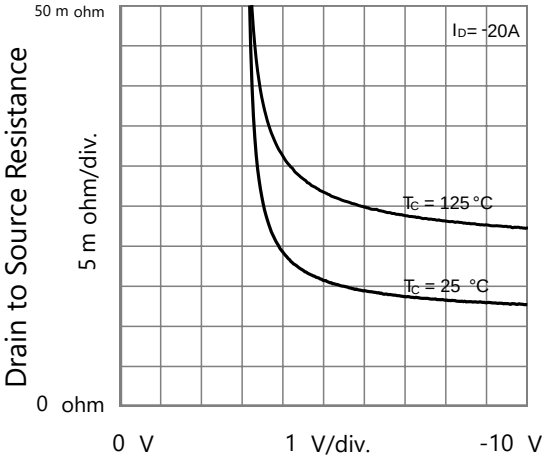
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Output Characteristics

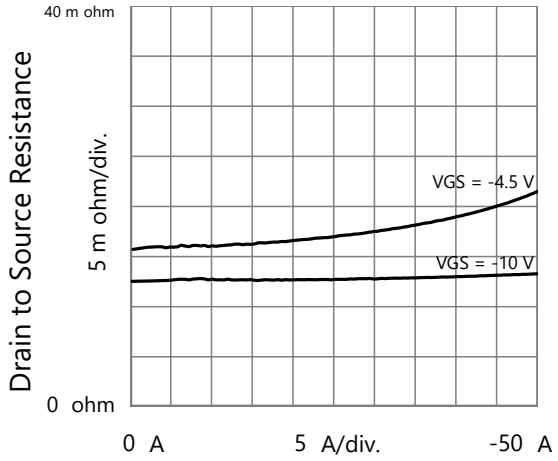


Transfer Characteristics



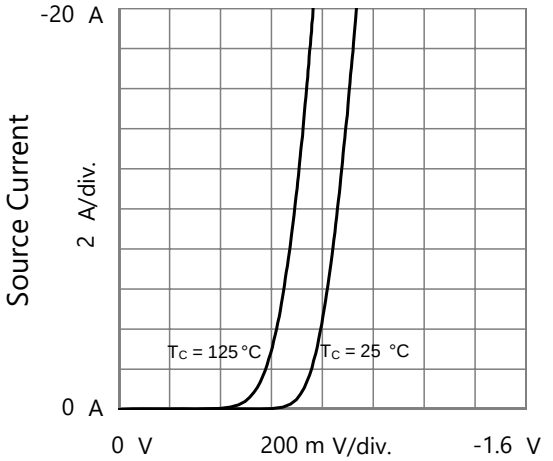
Gate to Source Voltage

Drain to Source Resistance vs. Gate to Source Voltage



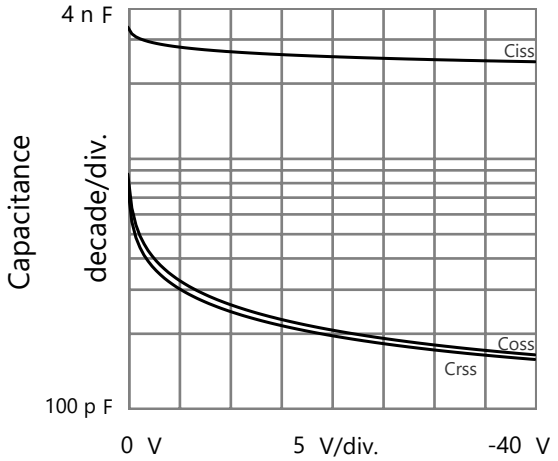
Drain Current

Drain to Source Resistance vs. Drain Current



Source to Drain Voltage

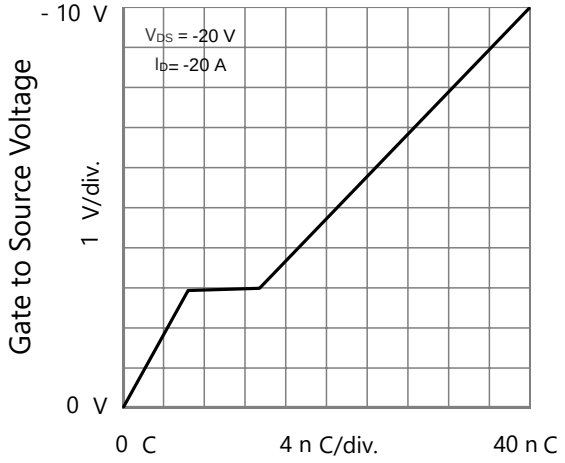
Body Diode Forward Characteristics



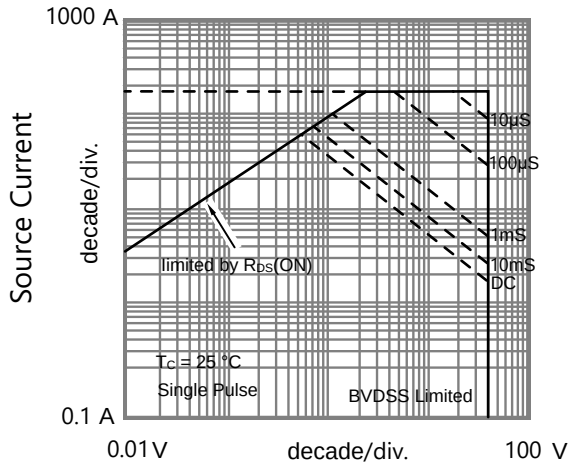
Drain to Source Voltage

Capacitances

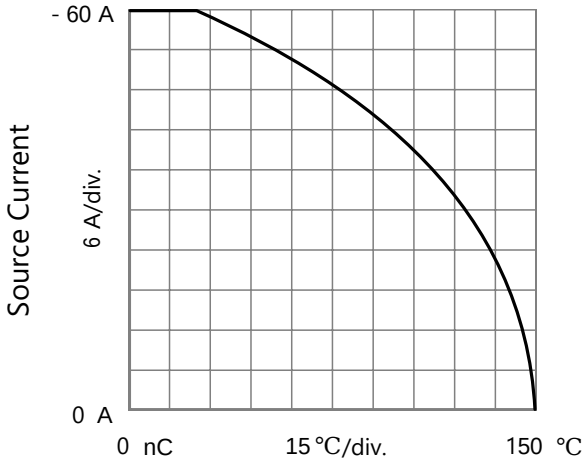
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



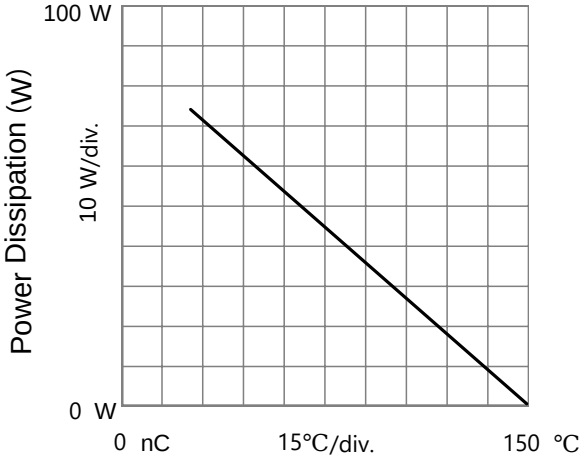
Gate Charge
Gate to Source Voltage vs. GateCharge



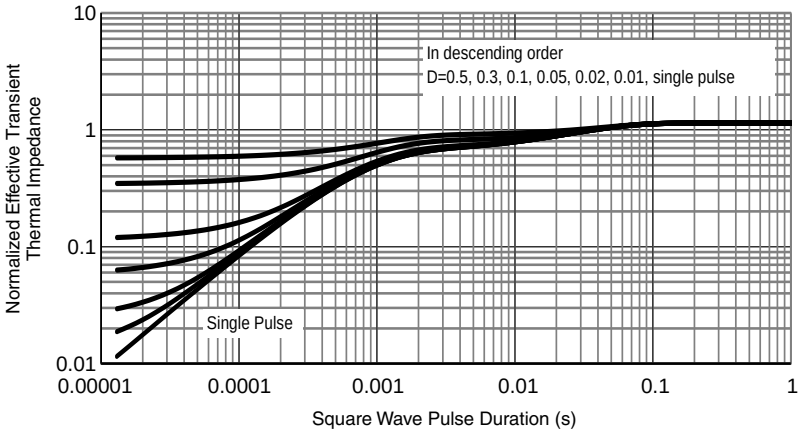
Source to Drain Voltage
Safe Operating Area, Junction-to-Ambient



T_C - Case Temperature
Current Derating

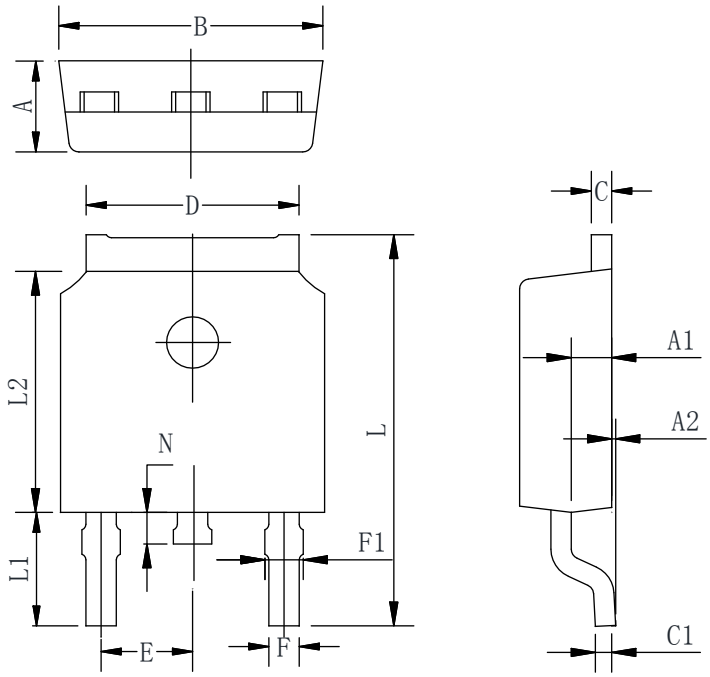


T_C - Case Temperature
Current Derating



Normalized Thermal Transient Impedance, Junction-to-Case

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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