

P-Channel 40-V (D-S) MOSFET

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

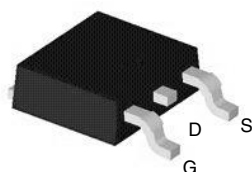
- DT-Trench Power MOSFET
- 100 % Rg and UIS Tested
- High density cell design for ultra low Rdson
- Good stability and uniformity with high EAS
- AEC-Q101 Qualified for Automotive Applications


RoHS
 COMPLIANT

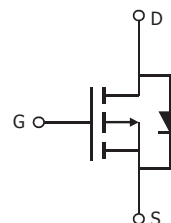
APPLICATIONS

- 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 = 175 °C) ^a	I _D	T _C = 25 °C - 60	A
		T _C = 100 °C - 46	
Pulsed Drain Current ^b	I _{DM}	- 180	
Maximum Power Dissipation ^c	P _D	T _C = 25 °C 78.5	W
		T _C = 100 °C 39.2	
Operating Junction and Storage Temperature Range	T _J , T _{stg}	- 55 to +175	°C

THERMAL RESISTANCE RATINGS

PARAMETER	SYMBOL	LIMIT	UNIT
Junction-to-Ambient (PCB Mount) ^d	R _{thJA}	48	°C/W
Junction-to-Case (Drain)	R _{thJC}	1.91	

Notes

- Calculated continuous current based on maximum allowable junction temperature.
- Repetitive rating; pulse width limited by max. junction temperature.
- P_D is based on max. junction temperature, using junction-case thermal resistance.
- The value of R_{thJA} is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with T_a=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		11		ns
Rise Time	t _r			19		
Turn-Off Delay Time	t _{d(off)}			38		
Fall Time	t _f			24		
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		40		ns
Body Diode Reverse Recovery Charge	Q _{rr}			42		nC

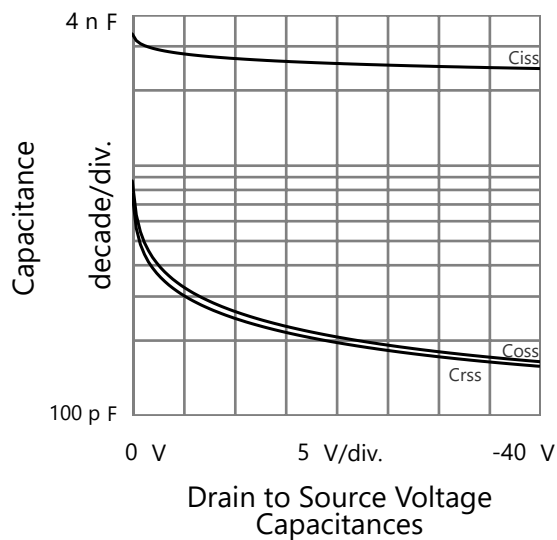
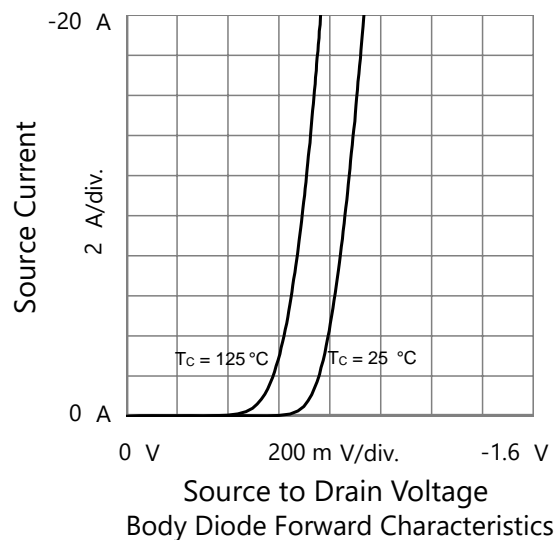
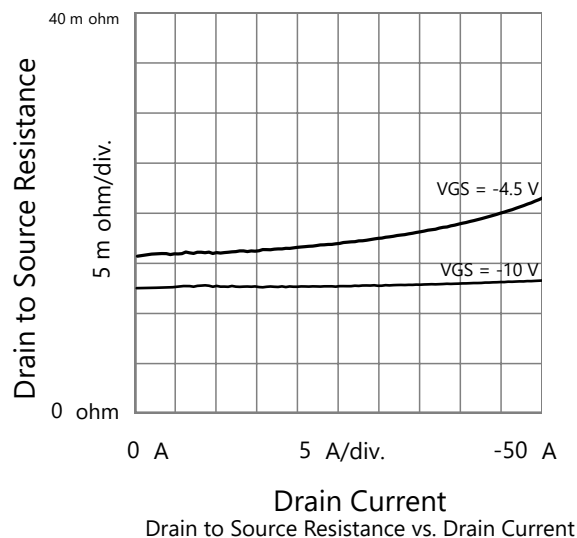
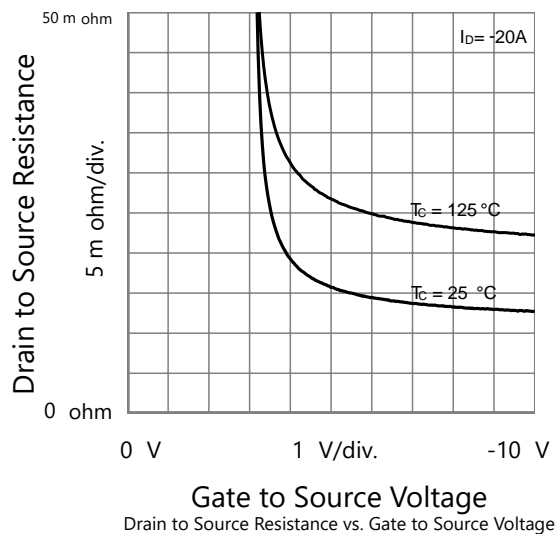
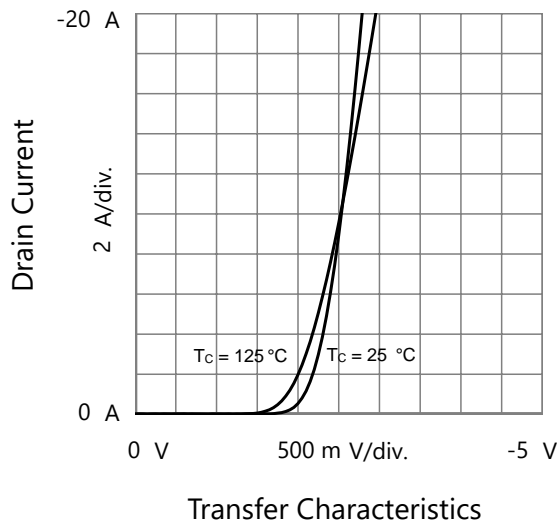
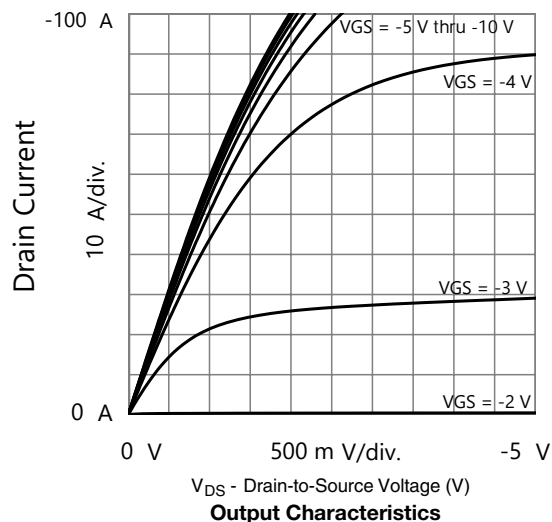
Notes:

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

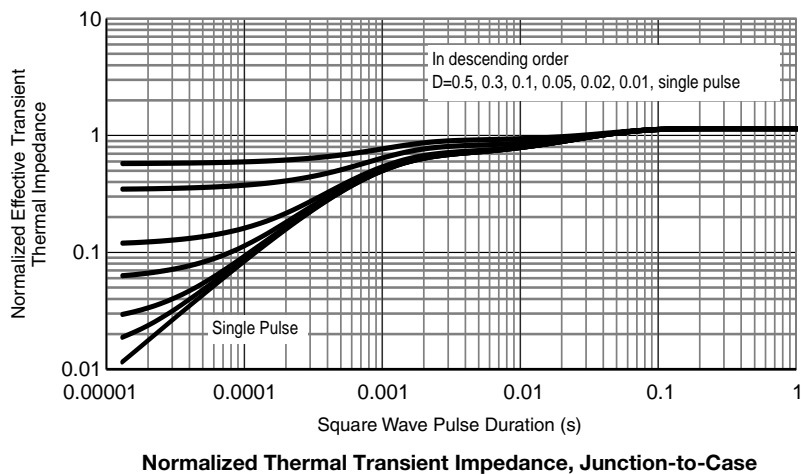
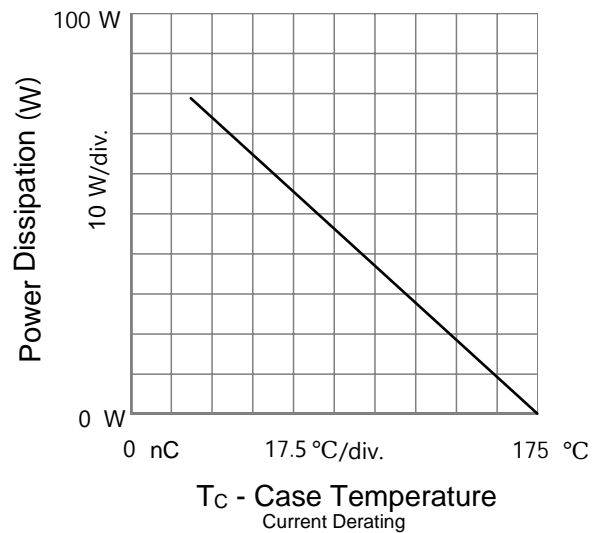
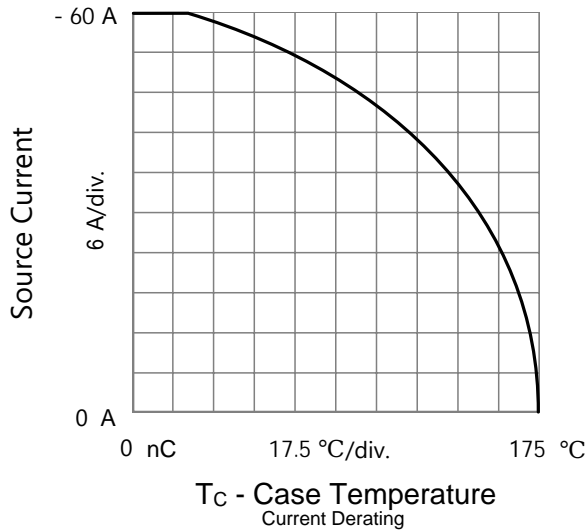
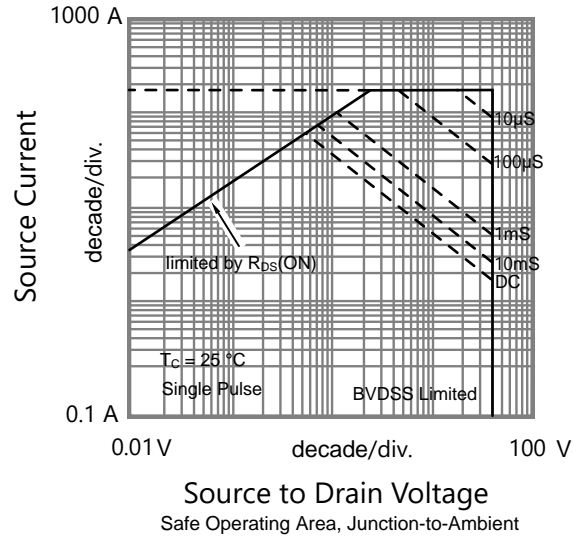
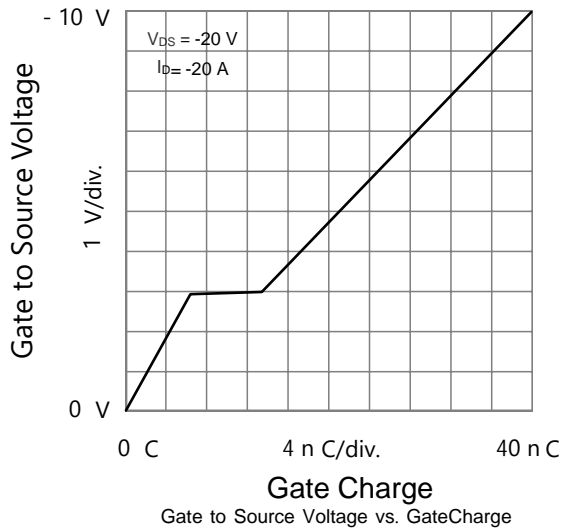
b. Guaranteed by design, not subject to production testing.

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.

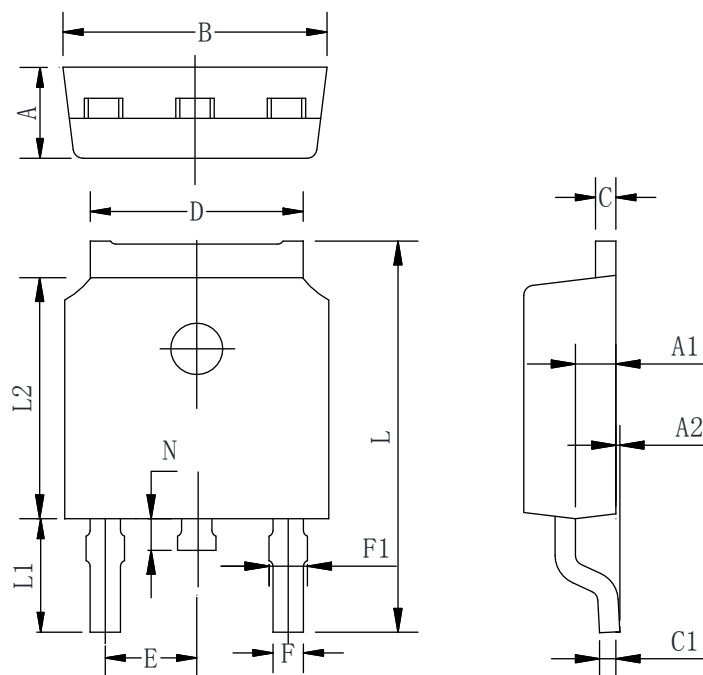
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



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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