P-Channel 40 V (D-S) MOSFEET

PRODUCT SUMMARY		
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)
- 40	0.0073 at V_{GS} = - 10 V	- 78[d]
	0.0095 at V_{GS} = - 4.5 V	- 70[d]

FEATURES

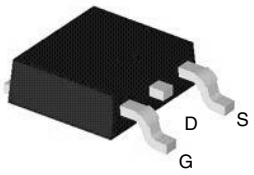
- DT-Trench Power MOSFET
- 100 % Rg and UIS Tested

RoHS COMPLIANT

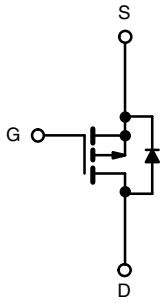
APPLICATIONS

- Load Switch

TO-252 Pin Configuration



Top View



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_A = 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)	T_C = 25 °C	I_D	- 78[d]	A
	T_C = 125 °C		- 46	
Pulsed Drain Current		I_{DM}	- 310	
Avalanche Current		I_{AR}	- 70	
Repetitive Avalanche Energy[a]	L = 0.1 mH	E_{AR}	155	mJ
Power Dissipation	T_C = 25 °C	P_D	95[c]	W
	T_A = 25 °C		3.3[b, c]	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 150	°C

THERMAL RESISTANCE RATINGS					
Parameter		**Symbol**	**Typical**	**Maximum**	**Unit**
Junction-to-Ambient[b]	t ≤ 10 s	R_{thJA}	20	30	°C/W
	Steady State		40	60	
Junction-to-Case		R_{thJC}	-	2.0	

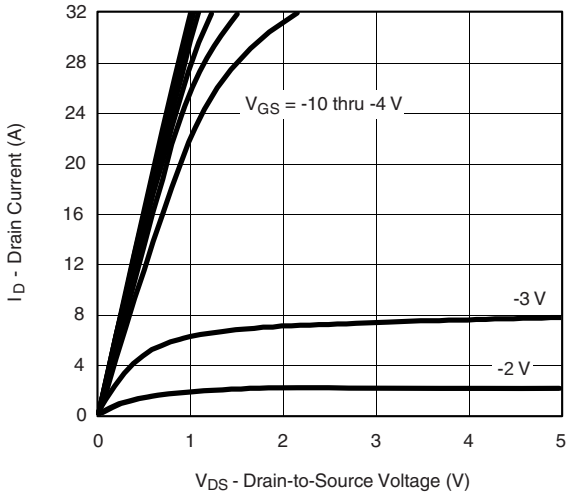
Notes:
a. Duty cycle ≤ 1 %.
b. When mounted on 1" square PCB (FR-4 material).
c. See SOA curve for voltage derating.
d. Package limited.

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 Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = - 250 µA	- 1		- 3	
Gate-Body 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 = 125 °C			- 50	
		V_{DS} = - 32 V, V_{GS} = 0 V, T_J = 150 °C			- 100	
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} = - 5 V, V_{GS} = - 10 V	- 78			A
Drain-Source On-State Resistance[a]	$R_{DS(on)}$	V_{GS} = - 10 V, I_D = - 30 A		0.0073	0.009	Ω
		V_{GS} = - 4.5 V, I_D = - 20 A		0.0095	0.012	
Forward Transconductance[a]	g_{fs}	V_{DS} = - 15 V, I_D = - 30 A		69		S
Dynamic[b]						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = - 20 V, f = 1 MHz		10810		pF
Output Capacitance	C_{oss}			482		
Reverse Transfer Capacitance	C_{rss}			101		
Total Gate Charge[c]	Q_g	V_{DS} = - 20 V, V_{GS} = - 10 V, I_D = -30 A		59		nC
Gate-Source Charge[c]	Q_{gs}			20		
Gate-Drain Charge[c]	Q_{gd}			7		
Turn-On Delay Time[c]	$t_{d(on)}$	V_{DD} = - 20 V, R_L = 0.6 Ω $I_D \cong$ - 5 A, V_{GEN} = - 10 V, R_G = 6Ω		15		ns
Rise Time[c]	t_r			30		
Turn-Off Delay Time[c]	$t_{d(off)}$			82		
Fall Time[c]	t_f			25		
Source-Drain Diode Ratings and Characteristics T_C = 25 °C[b]						
Continuous Current	I_S				- 78	A
Forward Voltage[a]	V_{SD}	I_F = - 1 A, V_{GS} = 0 V		- 0.7	- 1.2	V
Reverse Recovery Time	t_{rr}	I_F = - 10 A, dI/dt = 100 A/µs		49		ns
Reverse Recovery Charge	Q_{rr}	I_F = - 10 A, dI/dt = 100 A/µs		52		nC

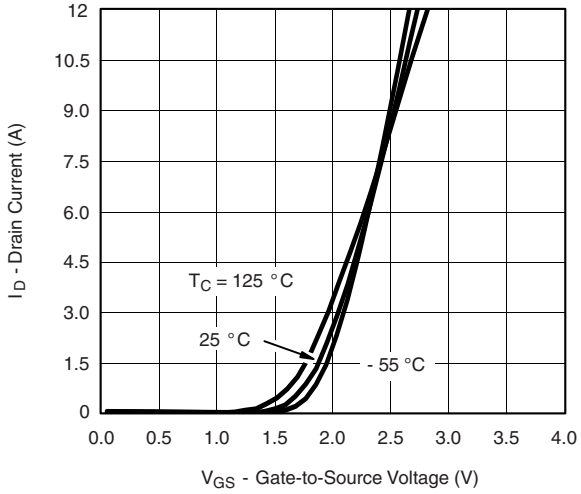
Notes:
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.
b. Guaranteed by design, not subject to production testing.
c. Independent of operating temperature.

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.

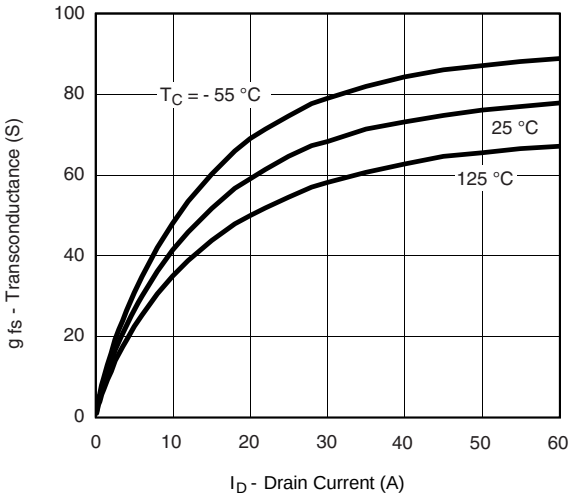
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



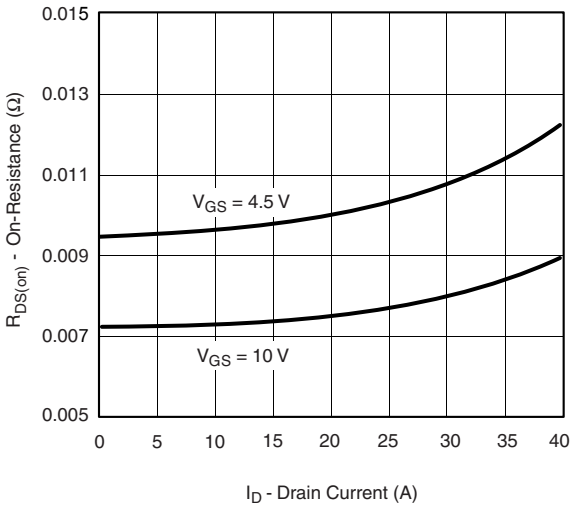
Output Characteristics



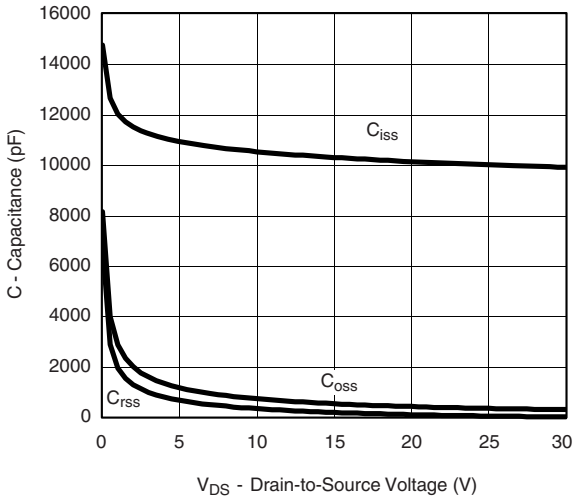
Transfer Characteristics



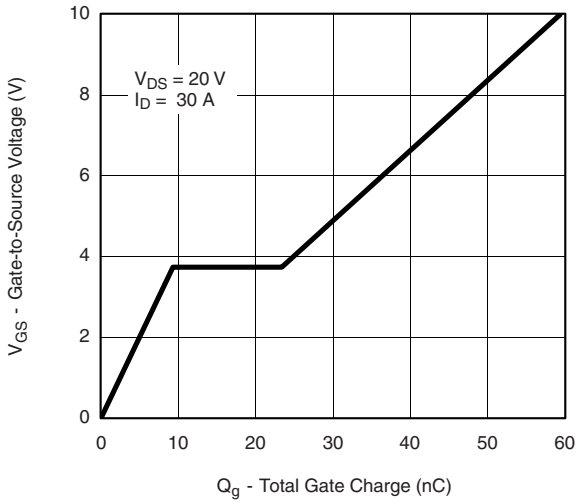
Transconductance



On-Resistance vs. Drain Current

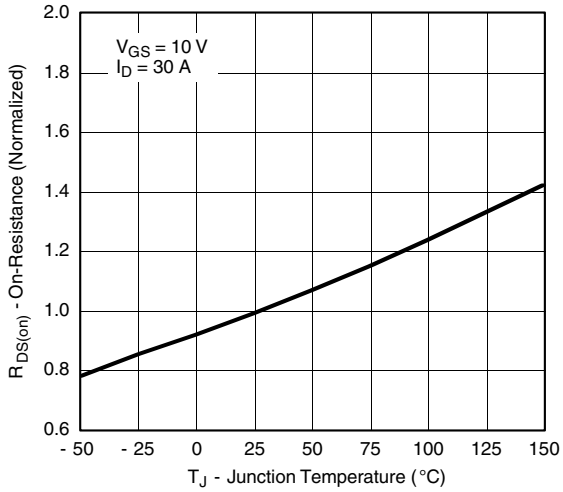


Capacitance

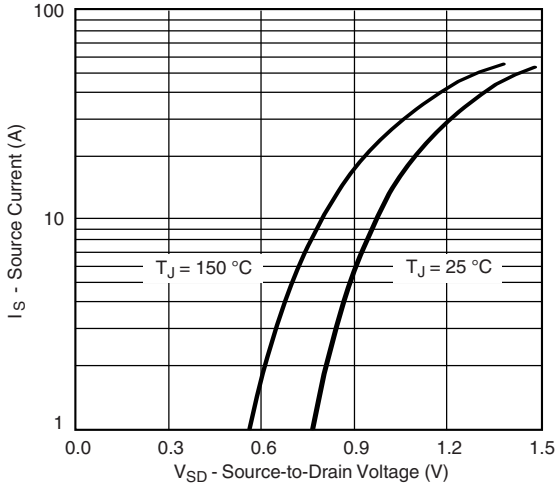


Gate Charge

TYPICAL CHARACTERISTICS

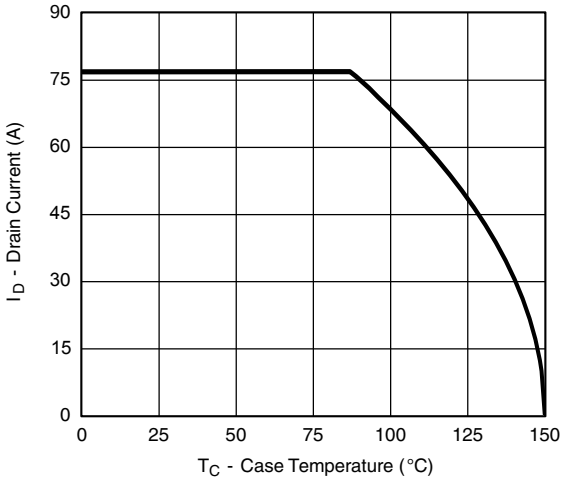


On-Resistance vs. Junction Temperature

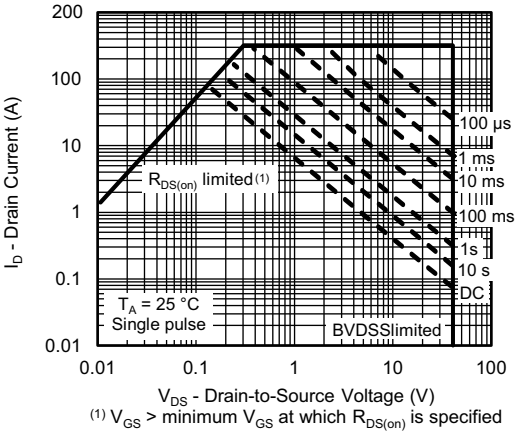


Source-Drain Diode Forward Voltage

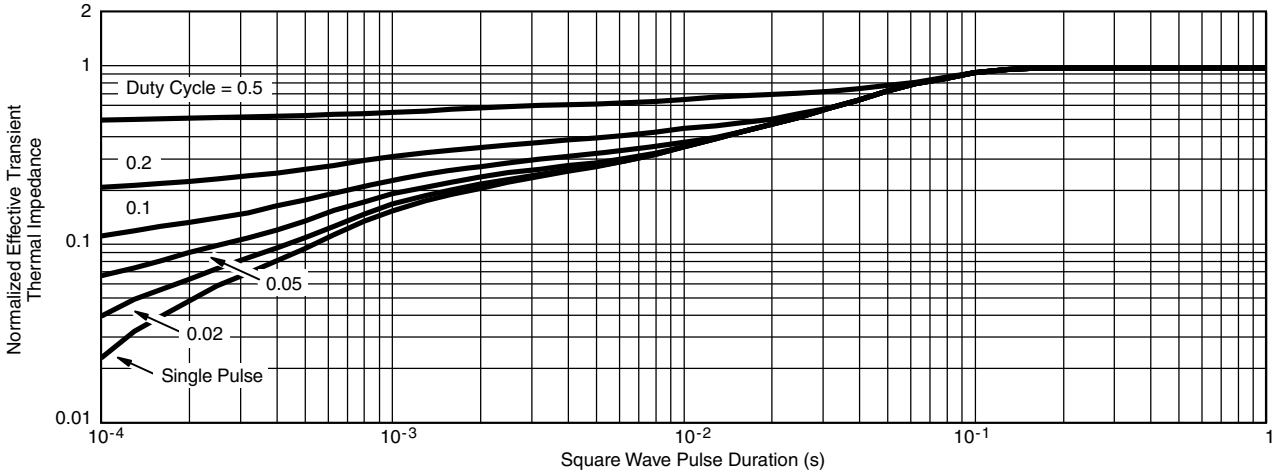
THERMAL RATINGS (25 °C, unless otherwise noted)



Drain Current vs. Case Temperature

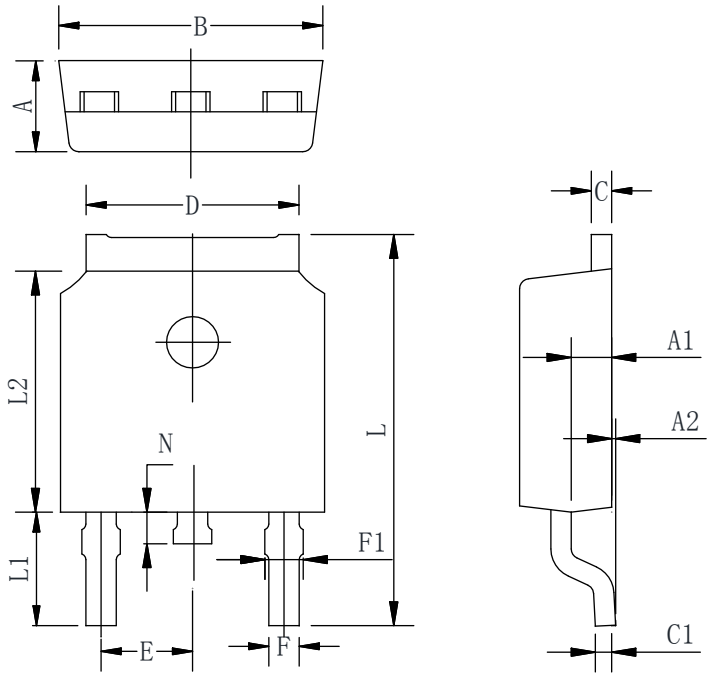


Safe Operating Area, Junction-to-Ambient



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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