P-Channel 30 V (D-S) MOSFET

PRODUCT SUMMARY		
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)[a]
- 30	0.0052 at V_{GS} = - 10 V	-85
	0.007 at V_{GS} = - 4.5 V	-80

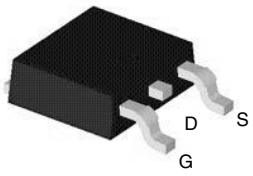
FEATURES

- Compliant to RoHS Directive 2002/95/EC

Available

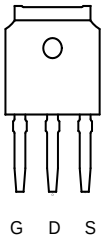
RoHS* COMPLIANT

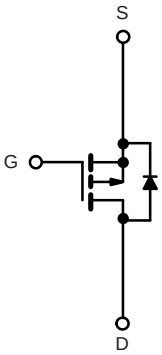
TO-252 Pin Configuration



Top View

TO-251





P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_C = 25 °C, unless otherwise noted)				
Parameter		**Symbol**	**Limit**	**Unit**
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current (T_J = 175 °C)	T_C = 25 °C	I_D	- 85[a]	A
	T_C = 125 °C		- 68	
Pulsed Drain Current		I_{DM}	- 260	
Avalanche Current		I_{AR}	- 67	
Repetitive Avalanche Energy[b]	L = 0.1 mH	E_{AR}	186	mJ
Power Dissipation	T_C = 25 °C (TO-220AB and TO-263)	P_D	187[d]	W
	T_A = 25 °C (TO-263)[c]		3.75	
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 (TO-251)[c]	R_{thJA}	40	°C/W
	Free Air (TO-252)		62.5	
Junction-to-Case		R_{thJC}	0.8	

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

* Pb containing terminations are not RoHS compliant, exemptions may apply.

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	- 30			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} = - 30 V, V_{GS} = 0 V			- 1	µA
		V_{DS} = - 24 V, V_{GS} = 0 V, T_J = 125 °C			- 50	
		V_{DS} = - 24 V, V_{GS} = 0 V, T_J = 175 °C			- 250	
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} = - 5 V, V_{GS} = - 10 V	- 120			A
Drain-Source On-State Resistance[a]	$R_{DS(on)}$	V_{GS} = - 10 V, I_D = - 30 A		0.0052	0.0063	Ω
		V_{GS} = - 10 V, I_D = - 30 A, T_J = 125 °C			0.0095	
		V_{GS} = - 10 V, I_D = - 30 A, T_J = 175 °C			0.0126	
		V_{GS} = - 4.5 V, I_D = - 20 A		0.007	0.010	
Forward Transconductance[a]	g_{fs}	V_{DS} = - 15 V, I_D = - 30 A	20			S
Dynamic[b]						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = - 15 V, f = 1 MHz		1089		pF
Output Capacitance	C_{oss}			759		
Reversen Transfer Capacitance	C_{rss}			419		
Total Gate Charge[c]	Q_g	V_{DS} = - 15 V, V_{GS} = - 10 V, I_D = - 30 A		130	280	nC
Gate-Source Charge[c]	Q_{gs}			62		
Gate-Drain Charge[c]	Q_{gd}			39		
Turn-On Delay Time[c]	$t_{d(on)}$	V_{DD} = - 15 V, R_L = 0.2 Ω $I_D \cong$ - 30 A, V_{GEN} = - 10 V, R_g = 2.5 Ω		30		ns
Rise Time[c]	t_r			268		
Turn-Off Delay Time[c]	$t_{d(off)}$			150		
Fall Time[c]	t_f			210		
Source-Drain Diode Ratings and Characteristics[b] (T_C = 25 °C)						
Continuous Current	I_S				- 85	A
Pulsed Current	I_{SM}				- 260	
Forward Voltage[a]	V_{SD}	I_F = - 1 A, V_{GS} = 0 V		- 1.2	- 1.5	V
Reverse Recovery Time	t_{rr}	I_F = - 30 A, dI/dt = 100 A/µs		55	100	ns
Peak Reverse Recovery Current	$I_{RM(REC)}$			2.5	5	A
Reverse Recovery Charge	Q_{rr}			0.07	0.25	µC

Notes:

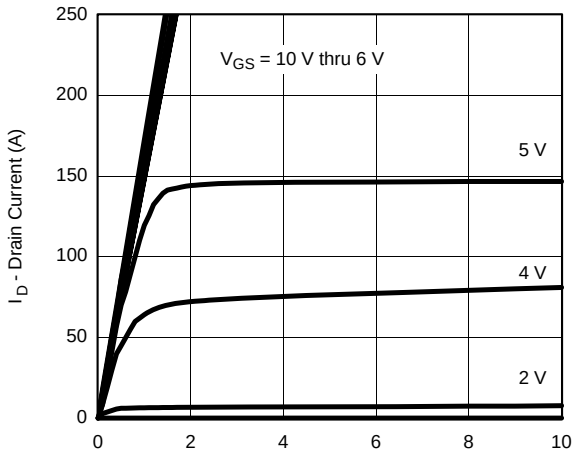
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.

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

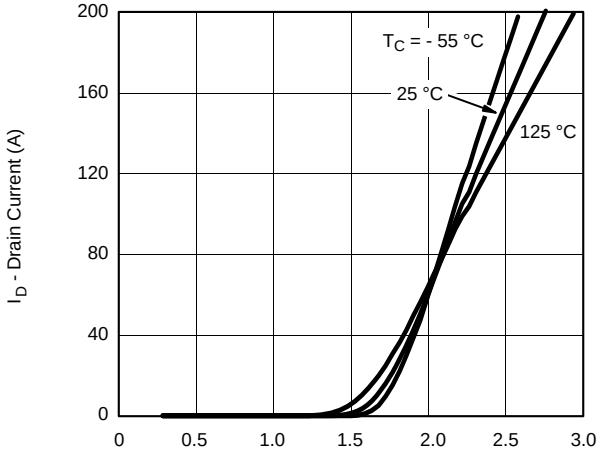
c. Independent of operating temperature.

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.

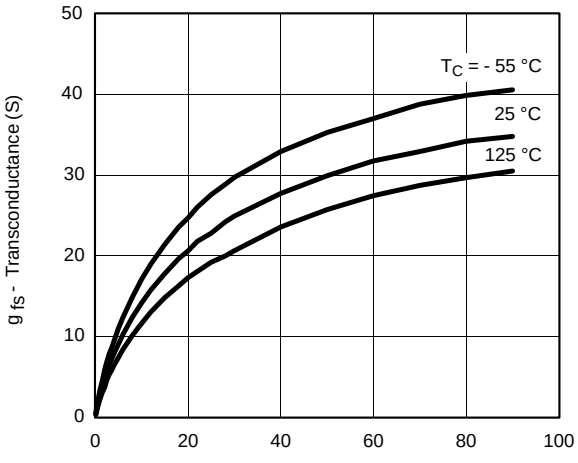
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



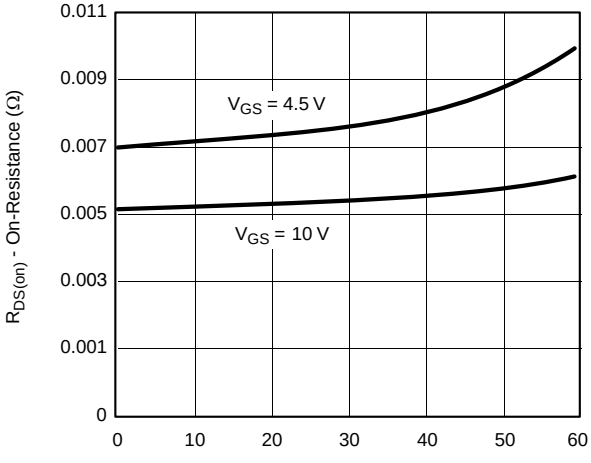
Output Characteristics



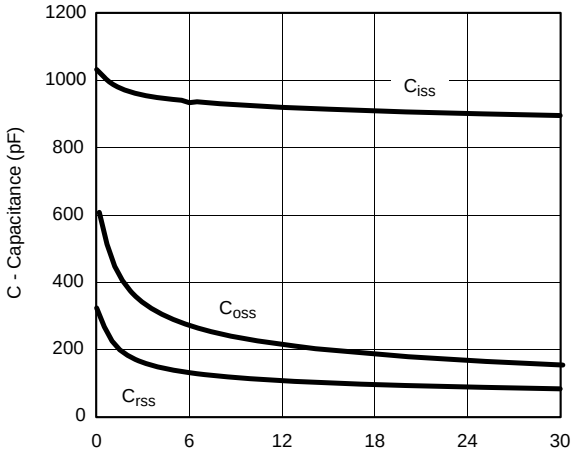
Transfer Characteristics



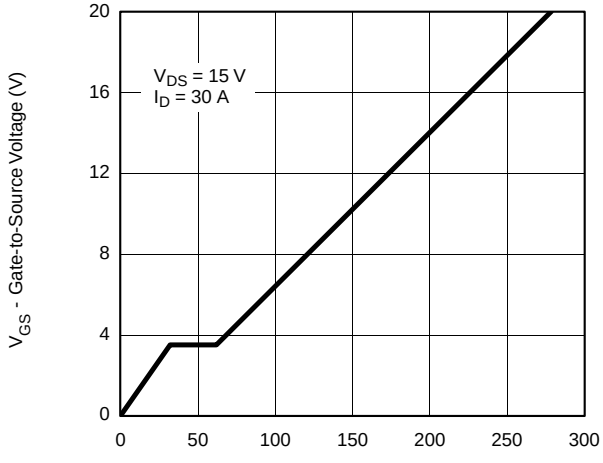
Transconductance



On-Resistance vs. Drain Current

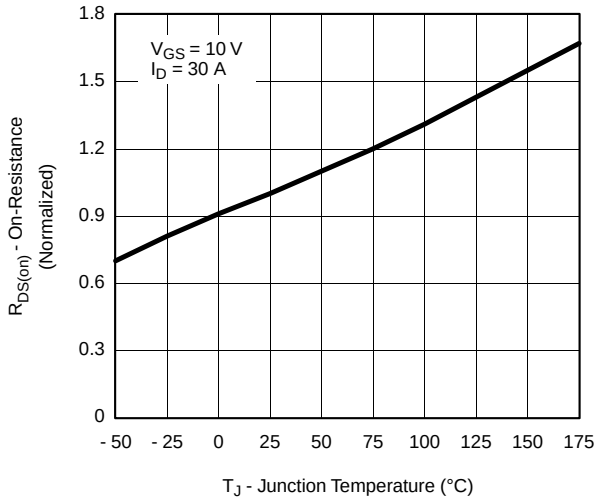


Capacitance

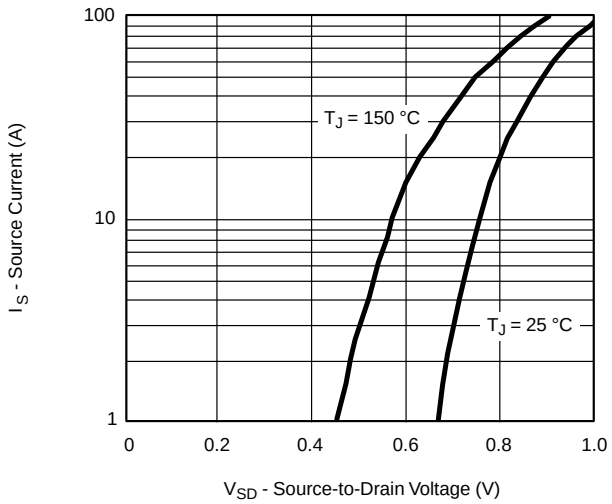


Gate Charge

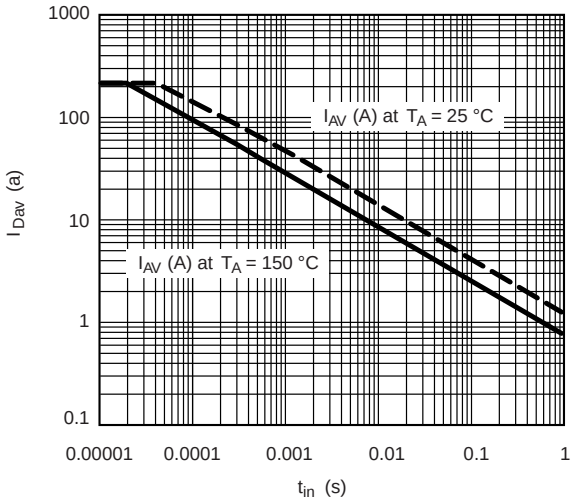
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



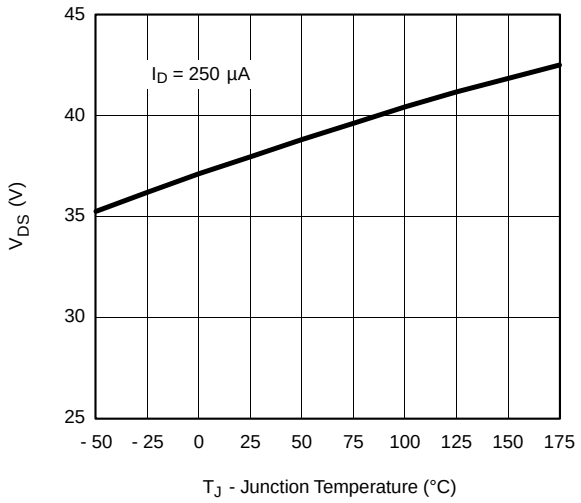
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage

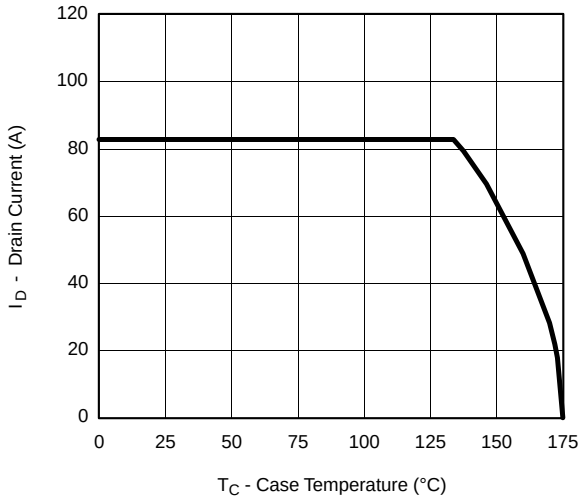


Avalanche Current vs. Time

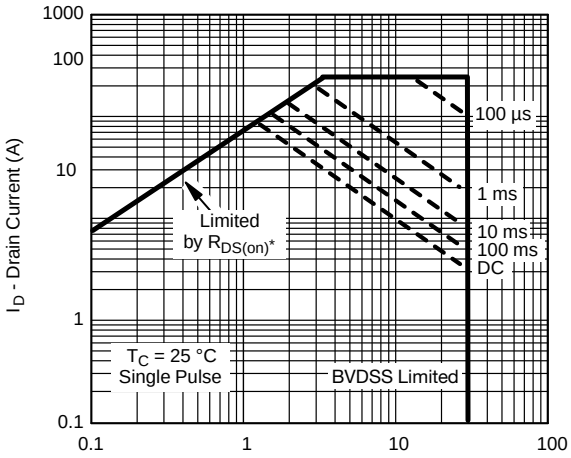


Drain Source Breakdown vs. Junction Temperature

THERMAL RATINGS

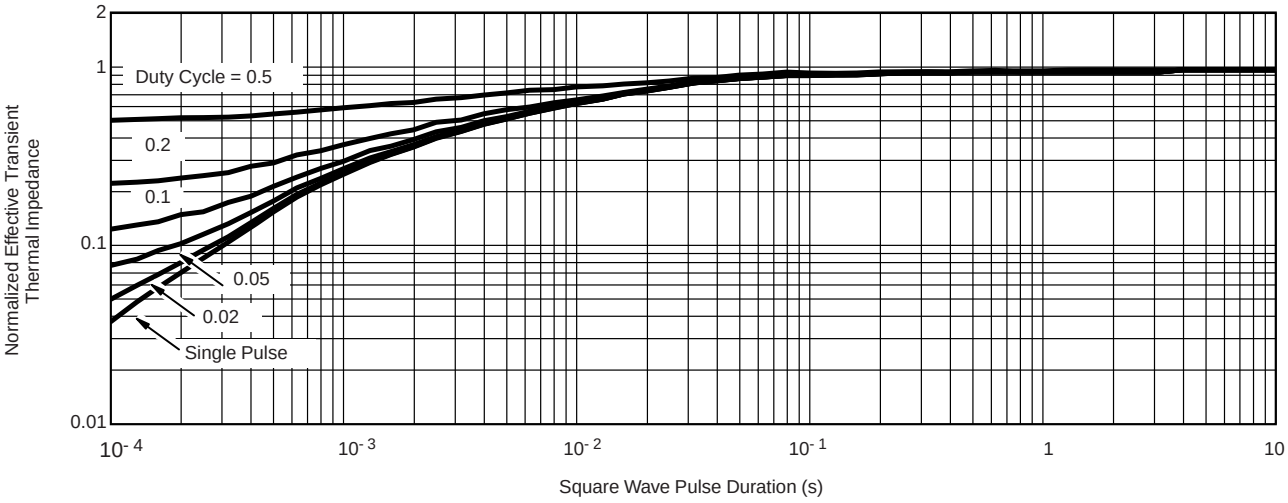


Maximum Avalanche and Drain Current vs. Case Temperature



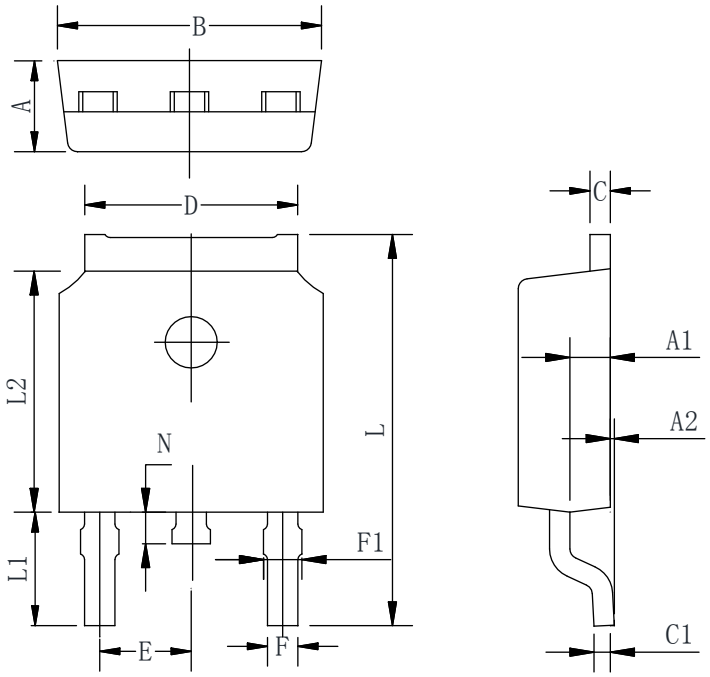
* V_{GS} > minimum V_{GS} at which $R_{DS(on)}$ is specified

Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case

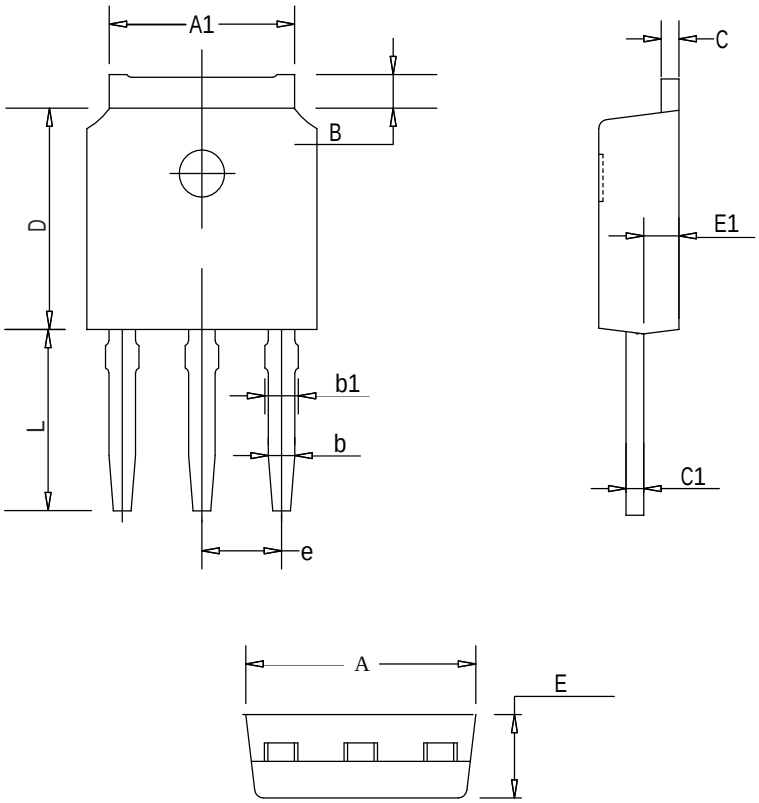
TO-252-2L PACKAGE OUTLINE



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

TO-251 PACKAGE OUTLINE



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	TYP	MAX
A	6.30	6.60	6.90
A1	5.00	5.30	5.60
B	0.80	1.00	1.20
C	0.40	0.50	0.60
C1	0.40	0.50	0.60
D	5.80	6.10	6.40
E	2.10	2.30	2.50
E1	0.80	1.00	1.20
L	4.50	5.00	5.50
e	2.10	2.30	2.50
b	0.66	0.76	0.86
b1	0.66	0.86	1.06

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