

P-Channel 60 V (D-S) MOSFET

PRODUCT SUMMARY

V _{DS} (V)	R _{DS(on)} (Ω)	I _D (A)
- 60	0.107 at V _{GS} = - 10 V	- 30 ^d
	0.130 at V _{GS} = - 4.5 V	- 20 ^d

FEATURES

- DT-Trench Power MOSFET
- 100 % RgandUIS Tested
- AEC-Q101 Qualified for Automotive Applications

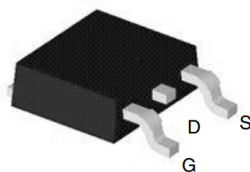


RoHS
COMPLIANT

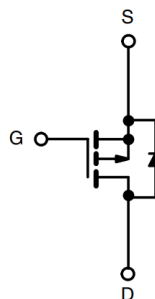
APPLICATIONS

- 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}	- 60	V	
Gate-Source Voltage	V _{GS}	± 20		
Continuous Drain Current (T _J = 175 °C)	I _D	T _C = 25 °C	- 30 ^d	
		T _C = 125 °C	- 18	
Pulsed Drain Current	I _{DM}	- 90	A	
Avalanche Current	I _{AS}	- 25		
Single Pulse Avalanche Energy ^a	L = 0.1 mH	E _{AS}	106	mJ
Power Dissipation	P _D	T _C = 25 °C	121 ^c	W
		T _A = 25 °C	2.7 ^{b, c}	
Operating Junction and Storage Temperature Range	T _J , T _{stg}	- 55 to 175	°C	

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Typical	Maximum	Unit
Junction-to-Ambient ^b	R _{thJA}	t ≤ 10 s	12	15
		Steady State	35	45
Junction-to-Case	R _{thJC}	0.8	1.1	°C/W

Notes:

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

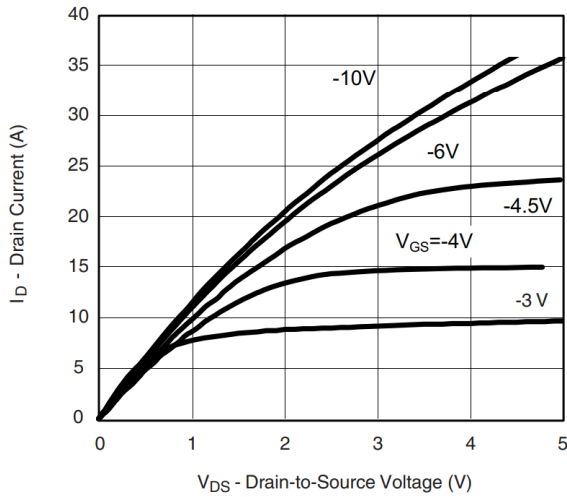
SPECIFICATIONS ($T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0\text{ V}, I_D = -250\text{ }\mu\text{A}$	- 60			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\text{ }\mu\text{A}$	- 1		- 3	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -48\text{ V}, V_{GS} = 0\text{ V}$			- 1	μA
		$V_{DS} = -48\text{ V}, V_{GS} = 0\text{ V}, T_J = 125\text{ }^\circ\text{C}$			- 50	
		$V_{DS} = -48\text{ V}, V_{GS} = 0\text{ V}, T_J = 150\text{ }^\circ\text{C}$			- 100	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} = -5\text{ V}, V_{GS} = -10\text{ V}$	- 50			A
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = -10\text{ V}, I_D = -5\text{ A}$		0.107	0.119	Ω
		$V_{GS} = -10\text{ V}, I_D = -10\text{ A}, T_J = 125\text{ }^\circ\text{C}$			0.131	
		$V_{GS} = -10\text{ V}, I_D = -10\text{ A}, T_J = 150\text{ }^\circ\text{C}$			0.155	
Forward Transconductance ^a	g_{fs}	$V_{DS} = -5\text{ V}, I_D = -10\text{ A}$		11		S
Dynamic^b						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = -25\text{ V}, f = 1\text{ MHz}$		1563		pF
Output Capacitance	C_{oss}			210		
Reverse Transfer Capacitance	C_{rss}			75		
Total Gate Charge ^c	Q_g	$V_{DS} = -30\text{ V}, V_{GS} = -10\text{ V}, I_D = -40\text{ A}$		20	28	nC
Gate-Source Charge ^c	Q_{gs}			11		
Gate-Drain Charge ^c	Q_{gd}			13		
Turn-On Delay Time ^c	$t_{d(on)}$	$V_{DD} = -30\text{ V}, R_L = 0.6\text{ }\Omega$ $I_D \cong -40\text{ A}, V_{GEN} = -10\text{ V}, R_G = 6\text{ }\Omega$		10		ns
Rise Time ^c	t_r			13		
Turn-Off Delay Time ^c	$t_{d(off)}$			35		
Fall Time ^c	t_f			15		
Source-Drain Diode Ratings and Characteristics $T_C = 25\text{ }^\circ\text{C}$ ^b						
Continuous Current	I_S				- 30	A
Pulsed Current	I_{SM}				- 60	
Forward Voltage ^a	V_{SD}	$I_F = -30\text{ A}, V_{GS} = 0\text{ V}$		- 1	- 1.6	V
Reverse Recovery Time	t_{rr}	$I_F = -30\text{ A}, dI/dt = 100\text{ A}/\mu\text{s}$		25	33	ns

Notes:

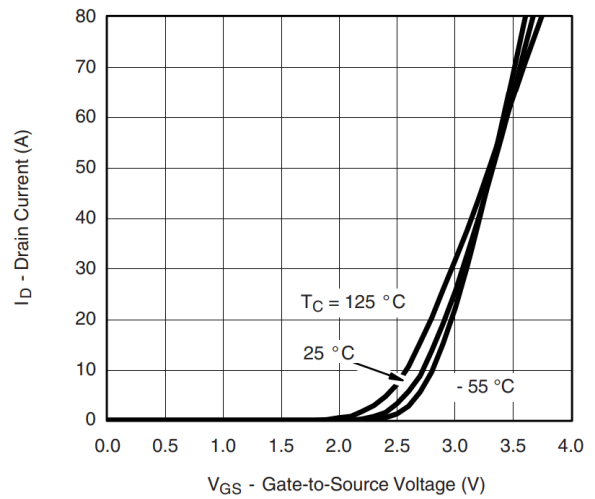
- Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.
- Independent of operating temperature.

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.

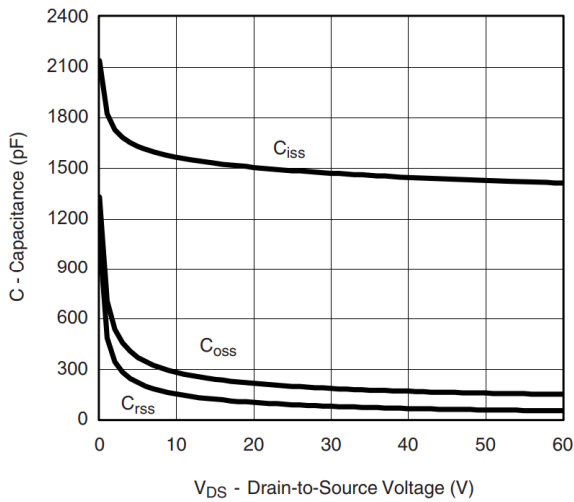
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



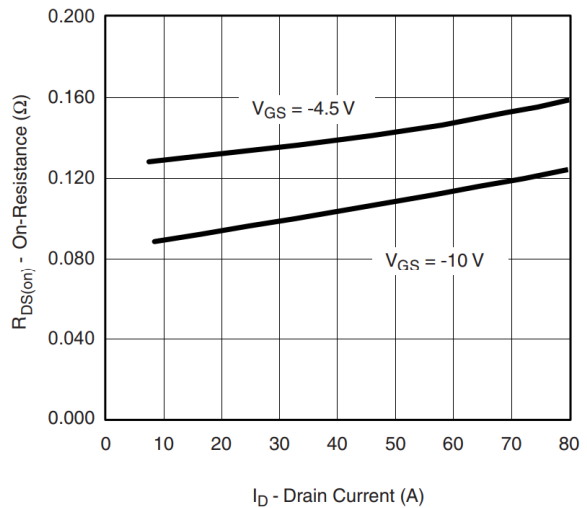
Output Characteristics



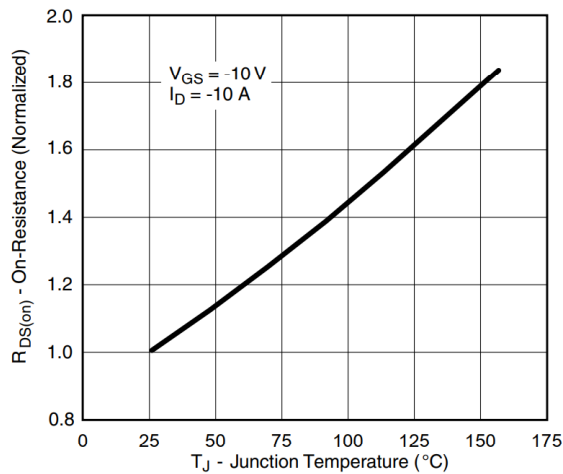
Transfer Characteristics



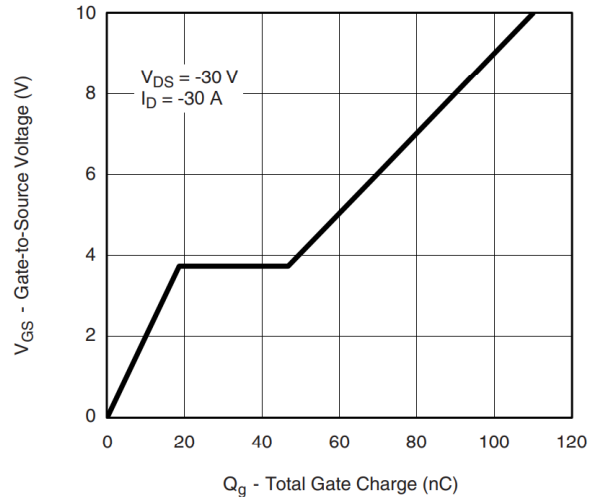
Capacitance



On-Resistance vs. Drain Current

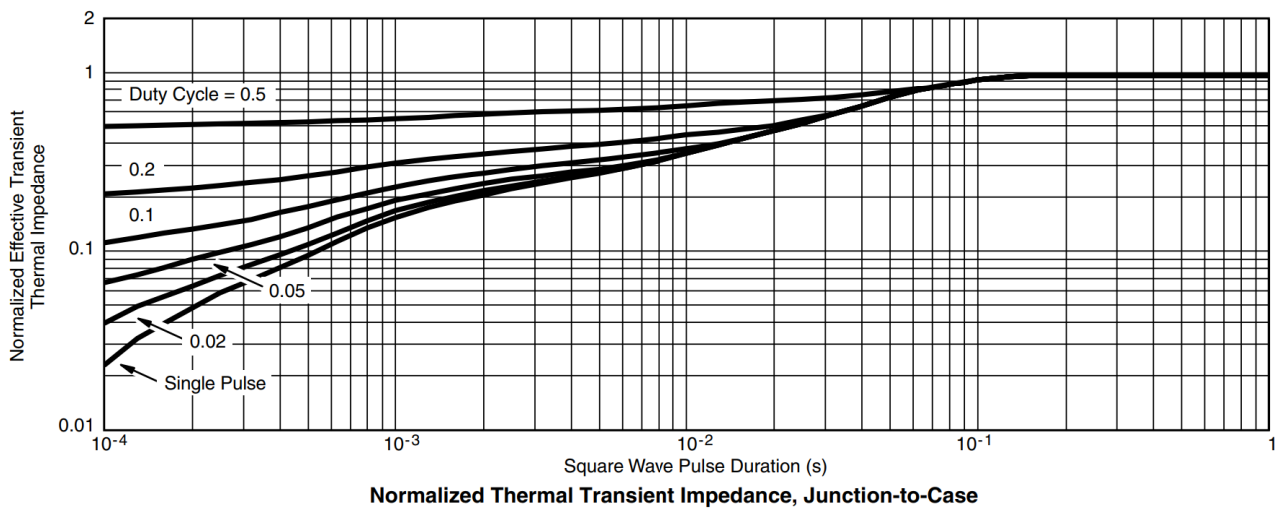
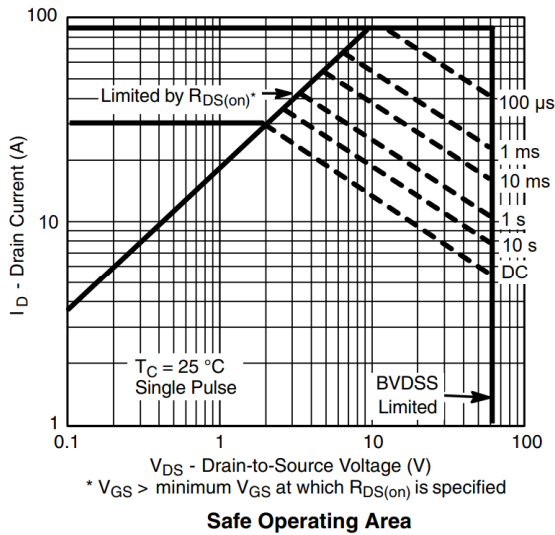
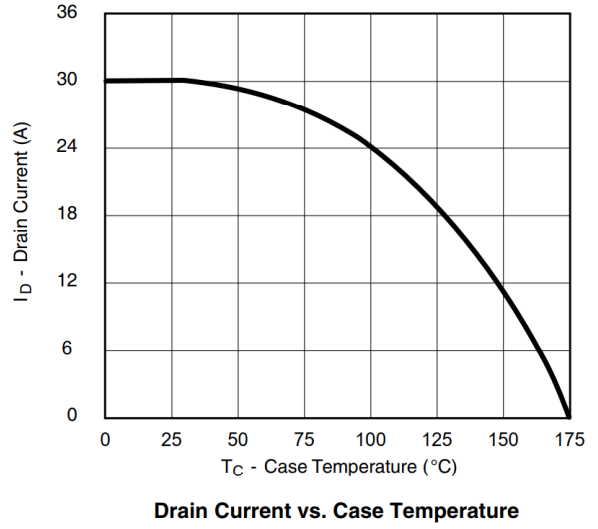
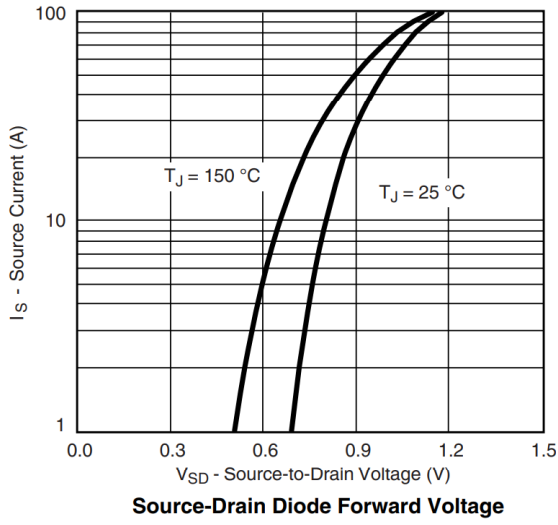


On-Resistance vs. Junction Temperature

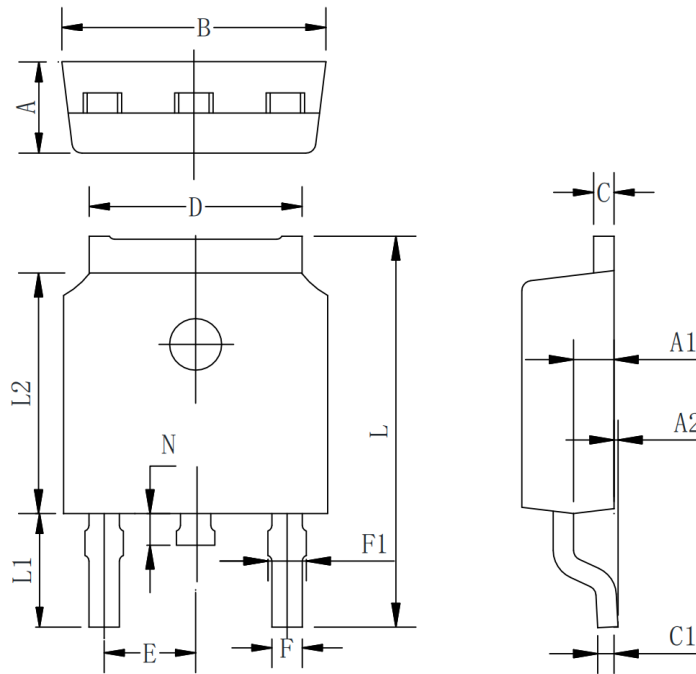


Gate Charge

TYPICAL CHARACTERISTICS



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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