

P-Channel 60 V (D-S) MOSFET

PRODUCT SUMMARY		
V _{DS} (V)	R _{DS(on)} (Ω)	I _D (A)
- 60	0.012 at V _{GS} = - 10 V	- 60 ^d
	0.014 at V _{GS} = - 4.5 V	- 55 ^d

FEATURES

- DT-Trench Power MOSFET
- Material categorization:

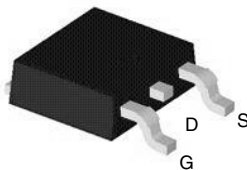


RoHS
COMPLIANT

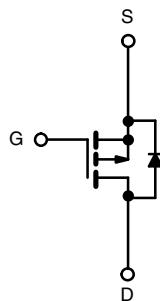
APPLICATIONS

- 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)	T _C = 25 °C	I _D	-60 ^d	A
	T _C = 100 °C		-49	
Pulsed drain current		I _{DM}	-240	
Avalanche current		I _{AR}	-55	
Repetitive avalanche energy ^a	L = 0.1 mH	E _{AR}	255	mJ
Power dissipation	T _C = 25 °C	P _D	196 ^c	W
	T _C = 75 °C		119 ^{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}	10	14	°C/W
	Steady state		20	30	
Junction-to-case		R _{thJC}	0.5	0.75	

Notes

- Duty cycle ≤ 1%
- When mounted on 1" square PCB (FR4 material)
- See SOA curve for voltage derating
- Package limited 60A

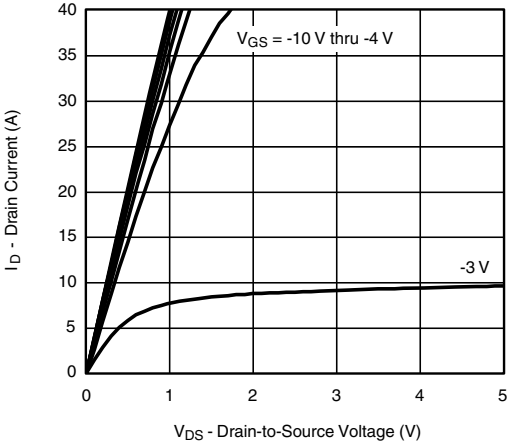
SPECIFICATIONS ($T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Static						
Drain-source breakdown voltage	V_{DS}	$V_{GS} = 0\text{ V}, I_D = -250\text{ }\mu\text{A}$	-60	-	-	V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\text{ }\mu\text{A}$	-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	
		$V_{DS} = -48\text{ V}, V_{GS} = 0\text{ V}, T_J = 175\text{ }^\circ\text{C}$	-	-	-150	
On-state drain current ^a	$I_{D(on)}$	$V_{DS} \geq -5\text{ V}, V_{GS} = -10\text{ V}$	-60	-	-	A
Drain-source on-state resistance ^a	$R_{DS(on)}$	$V_{GS} = -10\text{ V}, I_D = -20\text{ A}$	-	0.012	0.015	Ω
		$V_{GS} = -4.5\text{ V}, I_D = -15\text{ A}$	-	0.014	0.022	
Forward transconductance ^a	g_{fs}	$V_{DS} = -15\text{ V}, I_D = -20\text{ A}$	-	64	-	S
Dynamic ^b						
Input capacitance	C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = -30\text{ V}, f = 1\text{ MHz}$	-	10250	-	pF
Output capacitance	C_{oss}		-	599	-	
Reverse transfer capacitance	C_{rss}		-	112	-	
Total gate charge ^c	Q_g	$V_{DS} = -30\text{ V}, V_{GS} = -10\text{ V}, I_D = -20\text{ A}$	-	120	-	nC
Gate-source charge ^c	Q_{gs}		-	69	-	
Gate-drain charge ^c	Q_{gd}		-	38	-	
Turn-on delay time ^c	$t_{d(on)}$	$V_{DD} = -30\text{ V}, R_L = 0.6\text{ }\Omega$ $I_D \cong -20\text{ A}, V_{GEN} = -10\text{ V}, R_G = 6\text{ }\Omega$	-	18	-	ns
Rise time ^c	t_r		-	71	-	
Turn-off delay time ^c	$t_{d(off)}$		-	125	-	
Fall time ^c	t_f		-	135	-	
Source-Drain Diode Ratings and Characteristics ($T_C = 25\text{ }^\circ\text{C}$) ^b						
Continuous current	I_S		-	-	-60	A
Pulsed current	I_{SM}		-	-	-240	
Forward voltage ^a	V_{SD}	$I_F = -20\text{ A}, V_{GS} = 0\text{ V}$	-	0.8	-	V
Reverse recovery time	t_{rr}	$I_F = -20\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$	-	45	-	ns

Notes

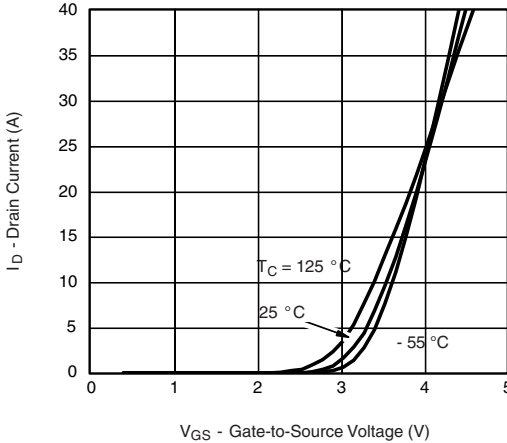
- Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\text{ }\%$
- Guaranteed by design, not subject to production testing
- Independent of operating temperature

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.

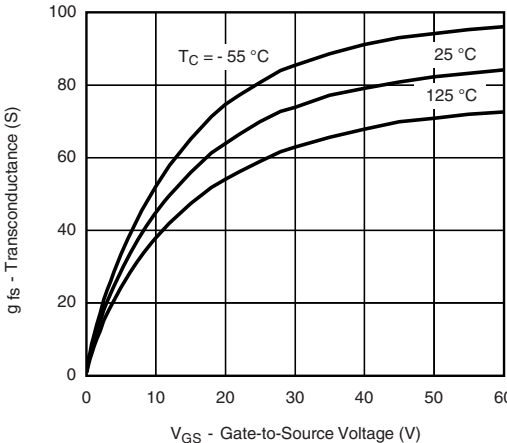
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



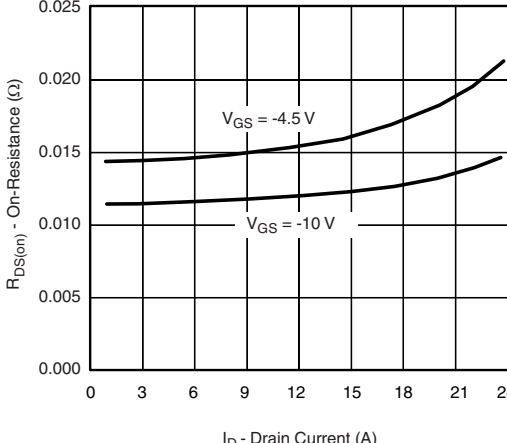
Output Characteristics



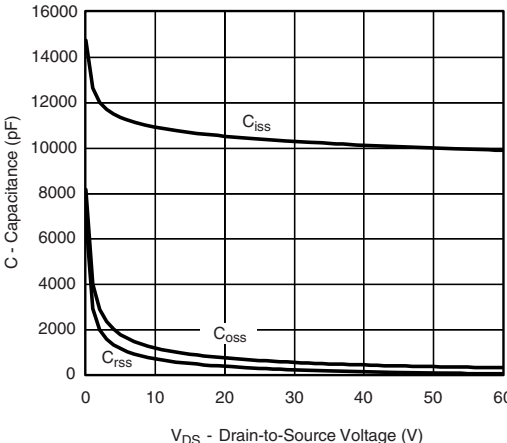
Transfer Characteristics



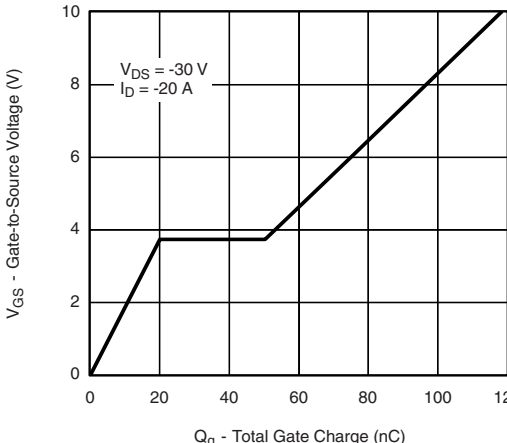
Transconductance



On-Resistance vs. Drain Current

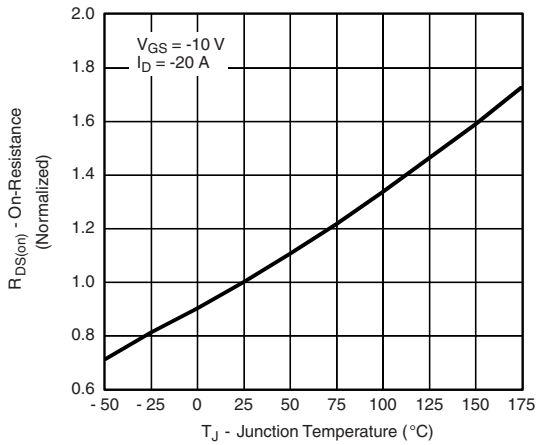


Capacitance

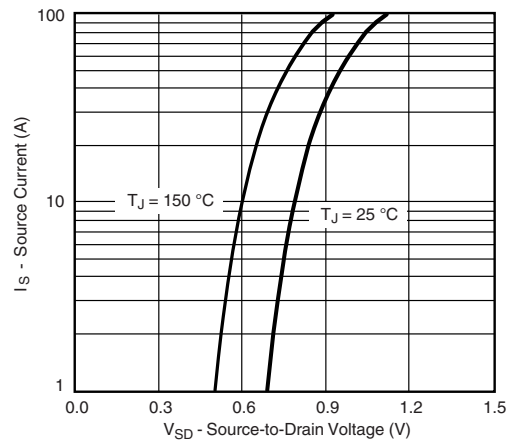


Gate Charge

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

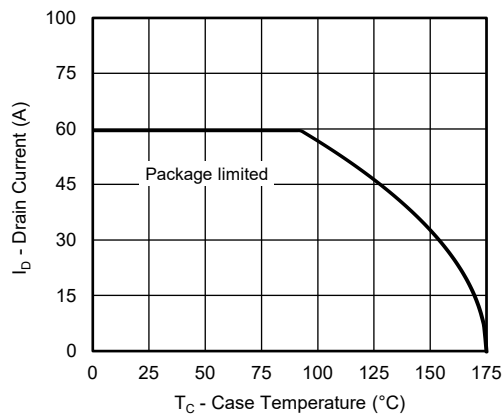


On-Resistance vs. Junction Temperature

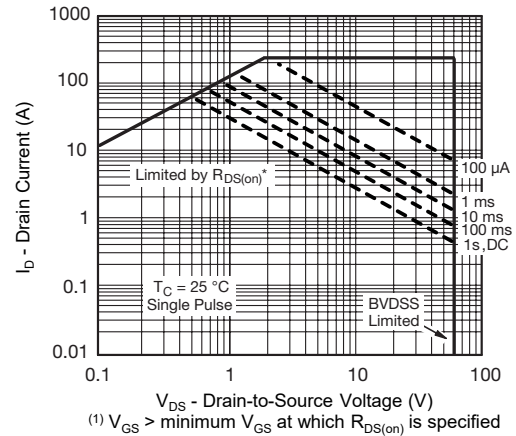


Source-Drain Diode Forward Voltage

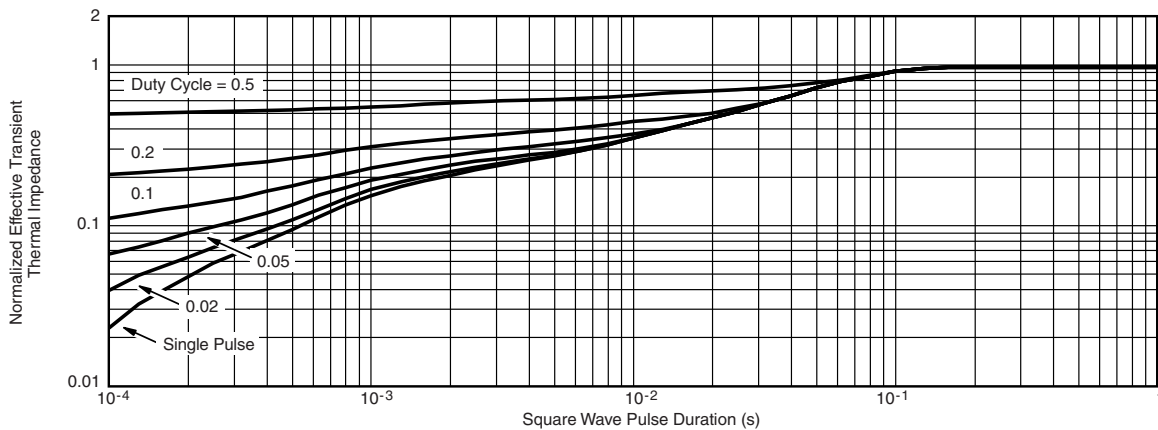
THERMAL RATINGS



Max. Avalanche and Drain Current vs. Case Temperature

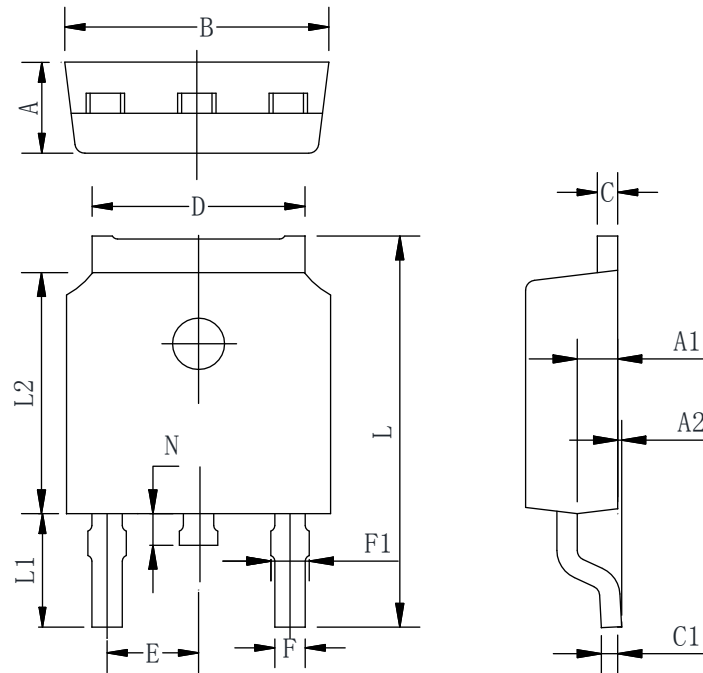


Safe Operating Area



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

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