

P-Channel 60 V (D-S) MOSFET

PRODUCT SUMMARY		
V _{DS} (V)	R _{DS(on)} (Ω)	I _D (A)
- 60	0.016 at V _{GS} = - 10 V	- 50 ^d
	0.020 at V _{GS} = - 4.5 V	- 45 ^d

FEATURES

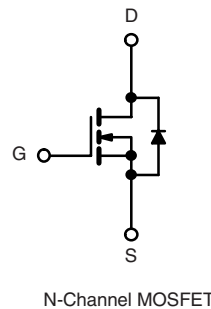
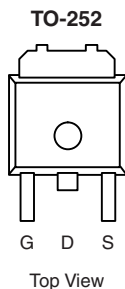
- DT-Trench Power MOSFET
- Material categorization:



RoHS
COMPLIANT

APPLICATIONS

- Load Switch



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	-50 ^d	A
	T _C = 100 °C		-39	
Pulsed drain current		I _{DM}	-200	
Avalanche current		I _{AR}	-50	
Repetitive avalanche energy ^a	L = 0.1 mH	E _{AR}	245	mJ
Power dissipation	T _C = 25 °C	P _D	186 ^c	W
	T _C = 75 °C		111 ^{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	15	°C/W
	Steady state		20	30	
Junction-to-case		R _{thJC}	0.5	0.75	

Notes

- uty cycle ≤ 1%
- When mounted on 1" square PCB (FR4 material)
- See SOA curve for voltage derating
- Package limited 50A

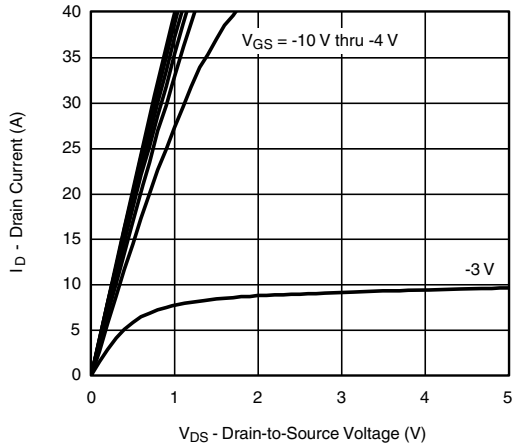
SPECIFICATIONS ($T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Static						
Drain-source breakdown voltage	V_{DS}	$V_{GS} = 0\text{ V}, I_D = -250\text{ }\mu\text{A}$	-60	-	-	V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\text{ }\mu\text{A}$	-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	$I_{D(on)}$	$V_{DS} \geq -5\text{ V}, V_{GS} = -10\text{ V}$	-50	-	-	A
Drain-source on-state resistance ^a	$R_{DS(on)}$	$V_{GS} = -10\text{ V}, I_D = -20\text{ A}$	-	0.016	0.022	Ω
		$V_{GS} = -4.5\text{ V}, I_D = -15\text{ A}$	-	0.020	0.028	
Forward transconductance ^a	g_{fs}	$V_{DS} = -15\text{ V}, I_D = -20\text{ A}$	-	64	-	S
Dynamic ^b						
Input capacitance	C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = -30\text{ V}, f = 1\text{ MHz}$	-	7750	-	pF
Output capacitance	C_{oss}		-	580	-	
Reverse transfer capacitance	C_{rss}		-	105	-	
Total gate charge ^c	Q_g	$V_{DS} = -30\text{ V}, V_{GS} = -10\text{ V}, I_D = -20\text{ A}$	-	110	-	nC
Gate-source charge ^c	Q_{gs}		-	63	-	
Gate-drain charge ^c	Q_{gd}		-	28	-	
Turn-on delay time ^c	$t_{d(on)}$	$V_{DD} = -30\text{ V}, R_L = 0.6\text{ }\Omega$ $I_D \cong -20\text{ A}, V_{GEN} = -10\text{ V}, R_G = 6\text{ }\Omega$	-	15	-	ns
Rise time ^c	t_r		-	70	-	
Turn-off delay time ^c	$t_{d(off)}$		-	175	-	
Fall time ^c	t_f		-	175	-	
Source-Drain Diode Ratings and Characteristics ($T_C = 25\text{ }^\circ\text{C}$) ^b						
Continuous current	I_S		-	-	-50	A
Pulsed current	I_{SM}		-	-	-200	
Forward voltage ^a	V_{SD}	$I_F = -20\text{ A}, V_{GS} = 0\text{ V}$	-	0.8	1.2	V
Reverse recovery time	t_{rr}	$I_F = -20\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$	-	45	-	ns

Notes

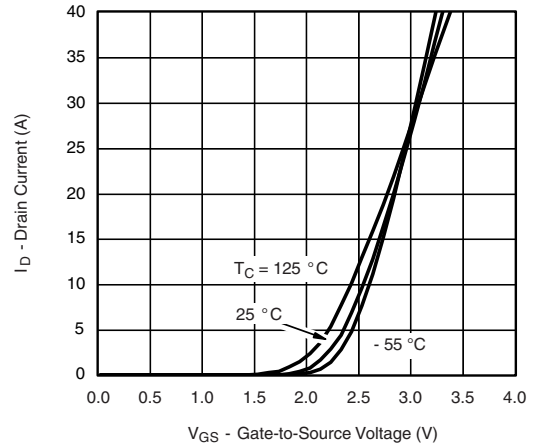
- Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$
- Guaranteed by design, not subject to production testing
- Independent of operating temperature

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.

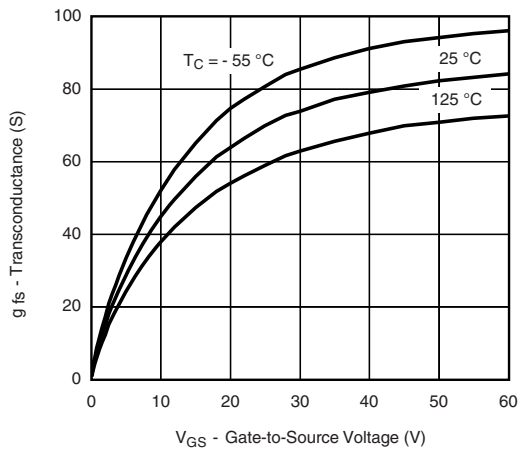
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



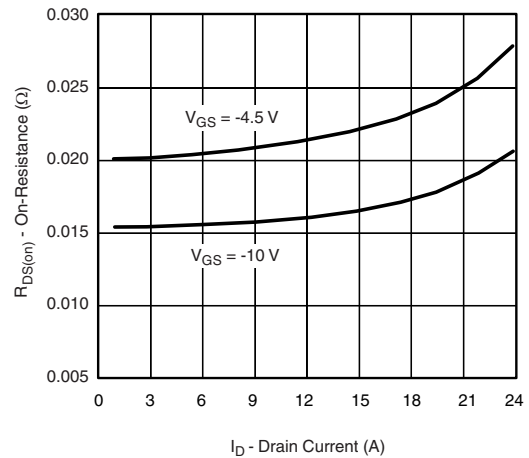
Output Characteristics



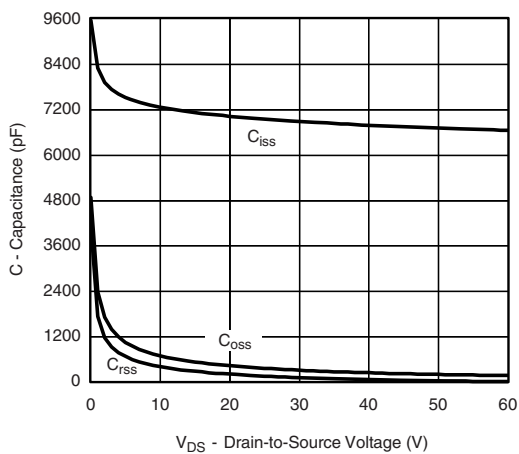
Transfer Characteristics



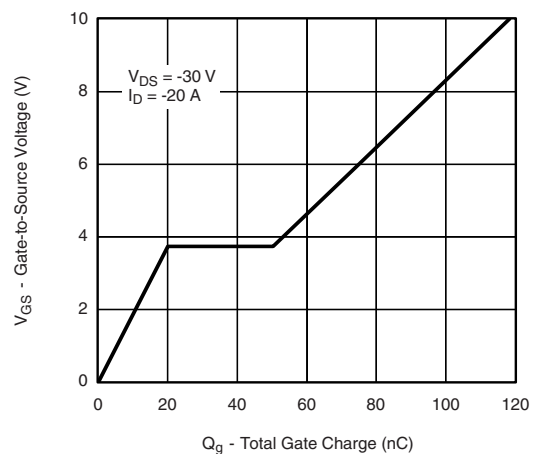
Transconductance



On-Resistance vs. Drain Current

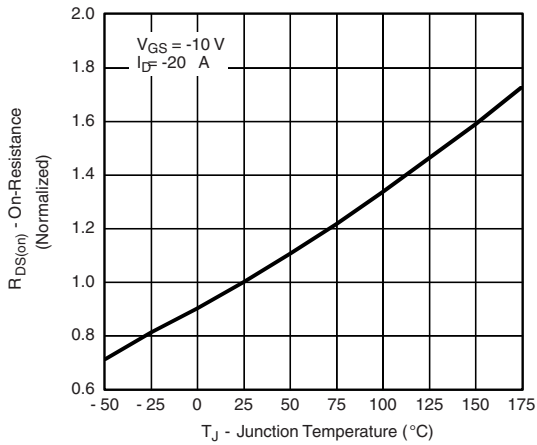


Capacitance

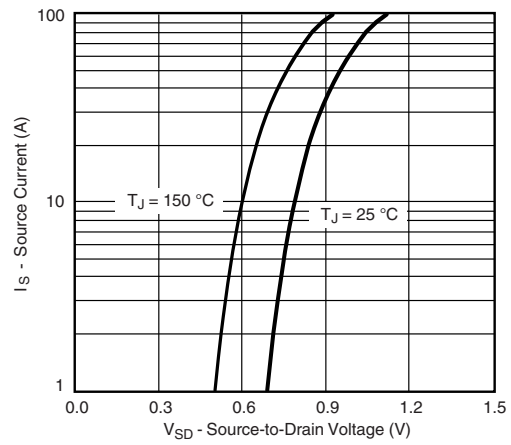


Gate Charge

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

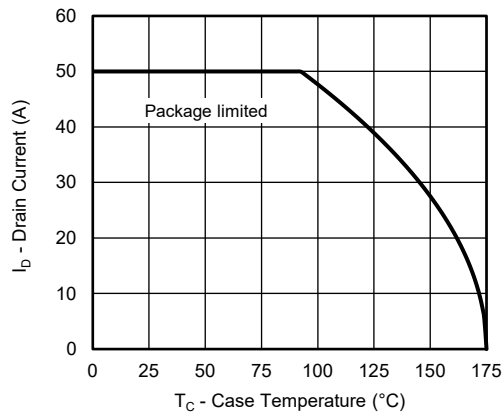


On-Resistance vs. Junction Temperature

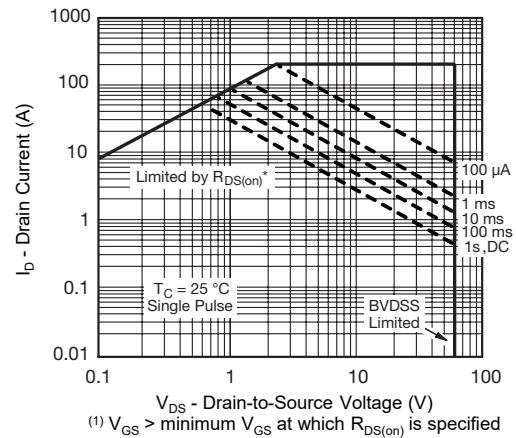


Source-Drain Diode Forward Voltage

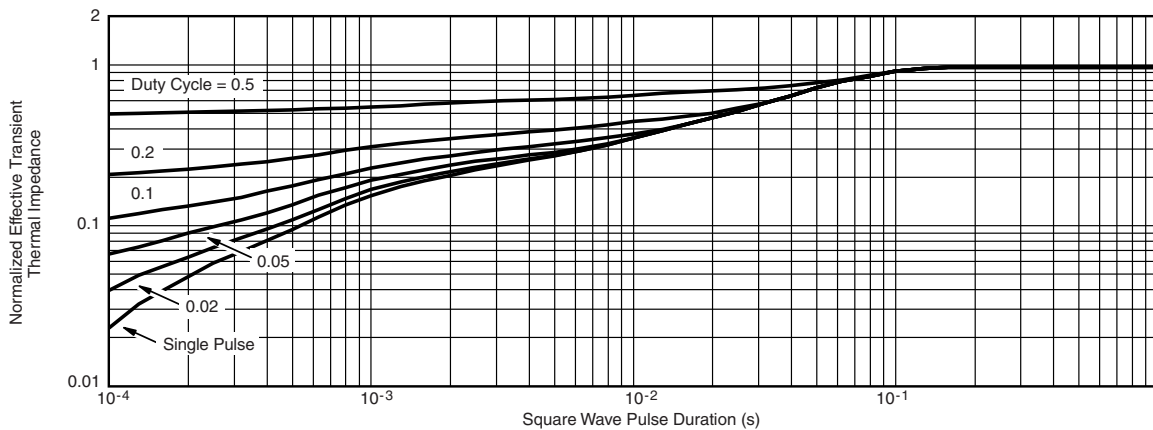
THERMAL RATINGS



Max. Avalanche and Drain Current vs. Case Temperature

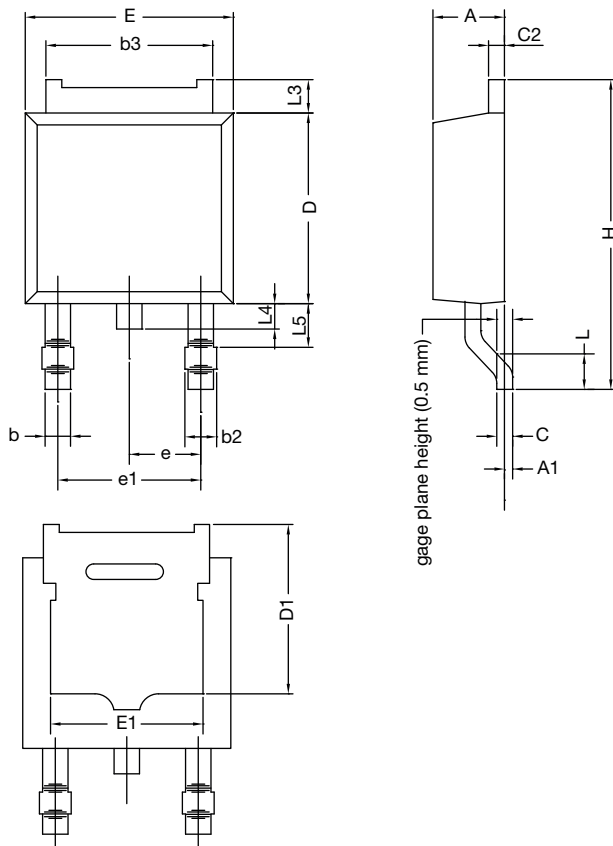


Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case

TO-252AA Case Outline

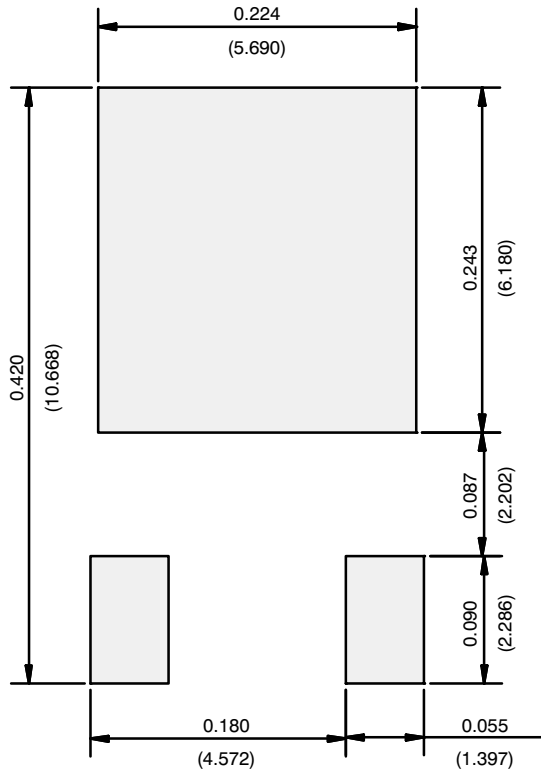


DIM.	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	2.18	2.38	0.086	0.094
A1	-	0.127	-	0.005
b	0.64	0.88	0.025	0.035
b2	0.76	1.14	0.030	0.045
b3	4.95	5.46	0.195	0.215
C	0.46	0.61	0.018	0.024
C2	0.46	0.89	0.018	0.035
D	5.97	6.22	0.235	0.245
D1	4.10	-	0.161	-
E	6.35	6.73	0.250	0.265
E1	4.32	-	0.170	-
H	9.40	10.41	0.370	0.410
e	2.28 BSC		0.090 BSC	
e1	4.56 BSC		0.180 BSC	
L	1.40	1.78	0.055	0.070
L3	0.89	1.27	0.035	0.050
L4	-	1.02	-	0.040
L5	1.01	1.52	0.040	0.060
ECN: T16-0236-Rev. P, 16-May-16 DWG: 5347				

Notes

- Dimension L3 is for reference only.

RECOMMENDED MINIMUM PADS FOR DPAK (TO-252)



Recommended Minimum Pads
Dimensions in Inches/(mm)

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