

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

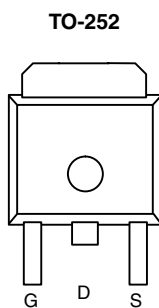
FEATURES

- DT-Trench Power MOSFET
- Material categorization:

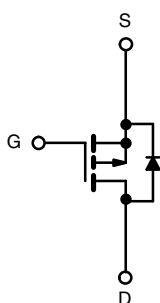

RoHS
 COMPLIANT

APPLICATIONS

- Load Switch

TO-252


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	-50 ^d	A
	$T_C = 100$ °C		-39	
Pulsed drain current		I_{DM}	-200	
Avalanche current		I_{AR}	-50	
Repetitive avalanche energy ^a		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	$t \leq 10$ s	R_{thJA}	10	15	°C/W
	Steady state		20	30	
Junction-to-case		R_{thJC}	0.5	0.75	

Notes

- a. Duty cycle $\leq 1\%$
 b. When mounted on 1" square PCB (FR4 material)
 c. See SOA curve for voltage derating
 d. Package limited 50A

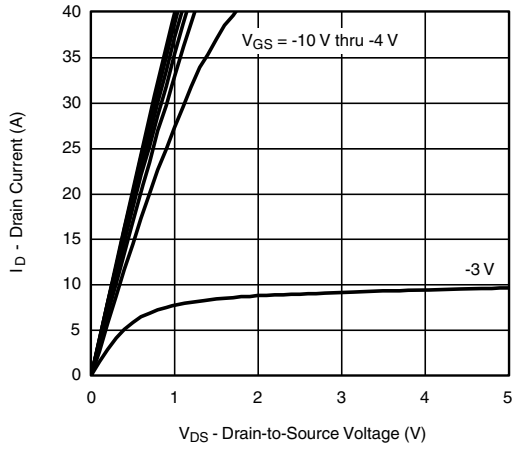
SPECIFICATIONS (T _J = 25 °C, unless otherwise noted)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Static						
Drain-source breakdown voltage	V _{DS}	V _{GS} = 0 V, I _D = -250 μA	-60	-	-	V
Gate threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250 μA	-1	-	-3	
Gate-body leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V	-	-	± 100	nA
Zero gate voltage drain current	I _{DSS}	V _{DS} = -48 V, V _{GS} = 0 V	-	-	-1	μA
		V _{DS} = -48 V, V _{GS} = 0 V, T _J = 125 °C	-	-	-50	
		V _{DS} = -48 V, V _{GS} = 0 V, T _J = 175 °C	-	-	-150	
On-state drain current ^a	I _{D(on)}	V _{DS} ≥ -5 V, V _{GS} = -10 V	-50	-	-	A
Drain-source on-state resistance ^a	R _{DS(on)}	V _{GS} = -10 V, I _D = -20 A	-	0.016	0.022	Ω
		V _{GS} = -4.5 V, I _D = -15 A	-	0.020	0.028	
Forward transconductance ^a	g _{fs}	V _{DS} = -15 V, I _D = -20 A	-	64	-	S
Dynamic ^b						
Input capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = -30 V, f = 1 MHz	-	7750	-	pF
Output capacitance	C _{oss}		-	580	-	
Reverse transfer capacitance	C _{rss}		-	105	-	
Total gate charge ^c	Q _g	V _{DS} = -30 V, V _{GS} = -10 V, I _D = -20 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 V, R _L = 0.6 Ω I _D ≡ -20 A, V _{GEN} = -10 V, R _G = 6 Ω	-	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 °C) ^b						
Continuous current	I _S		-	-	-50	A
Pulsed current	I _{SM}		-	-	-200	
Forward voltage ^a	V _{SD}	I _F = -20 A, V _{GS} = 0 V	-	0.8	1.2	V
Reverse recovery time	t _{rr}	I _F = -20 A, di/dt = 100 A/μs	-	45	-	ns

Notes

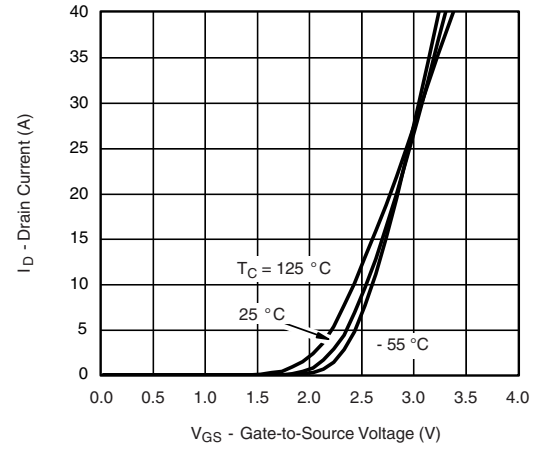
- Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\text{ }\%$
- Guaranteed by design, not subject to production testing
- Independent of operating temperature

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.

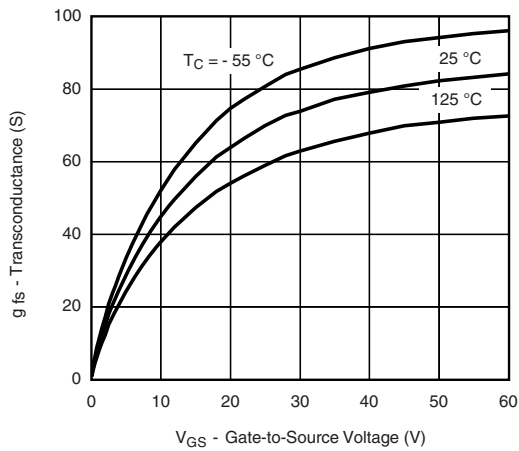
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



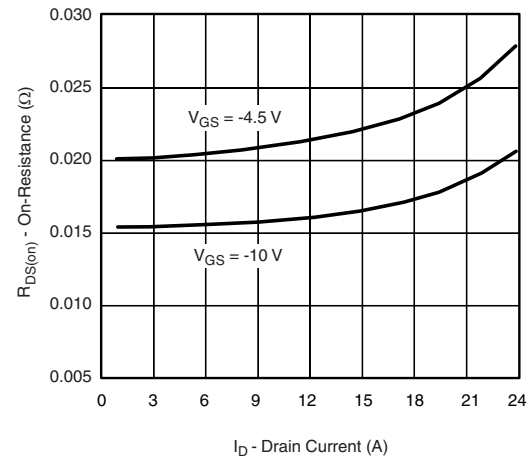
Output Characteristics



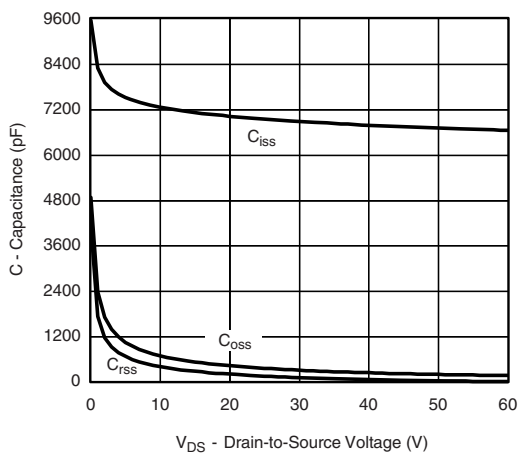
Transfer Characteristics



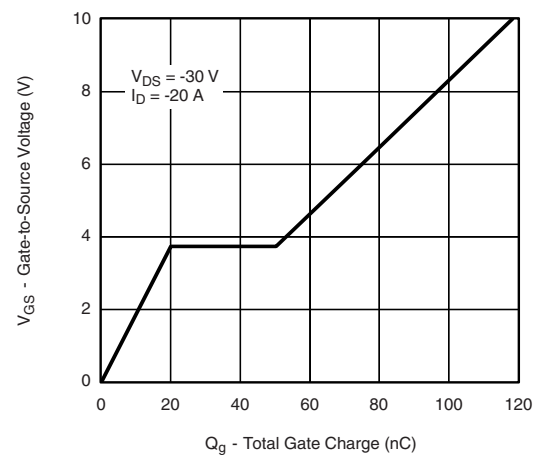
Transconductance



On-Resistance vs. Drain Current

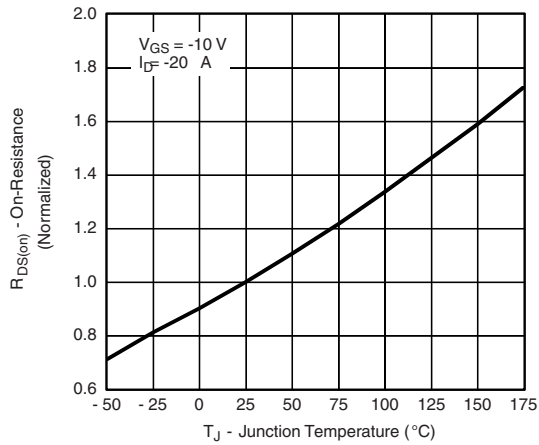


Capacitance

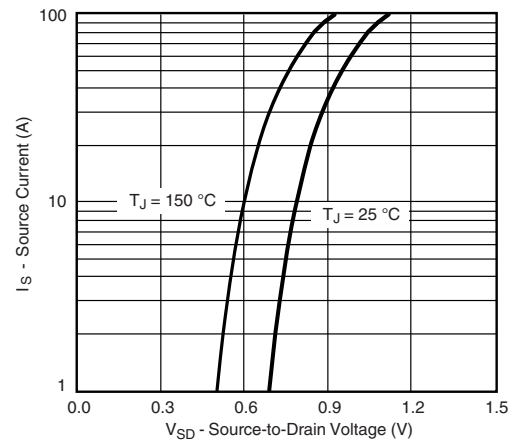


Gate Charge

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

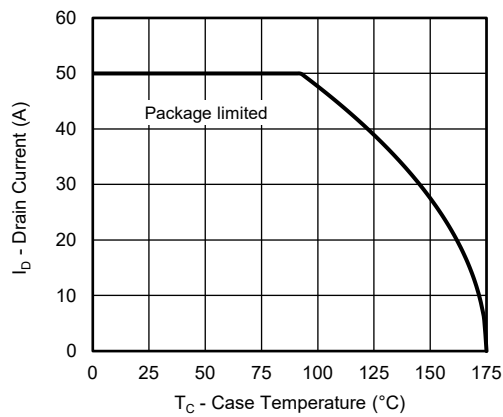


On-Resistance vs. Junction Temperature

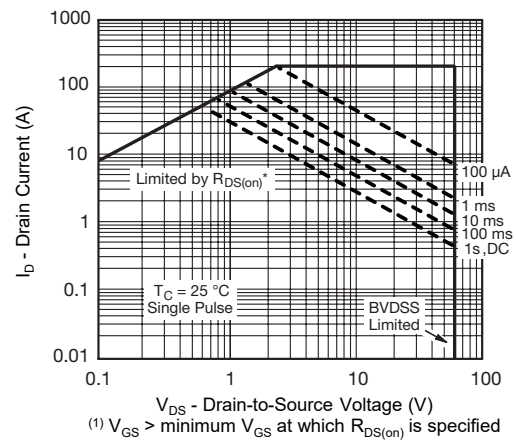


Source-Drain Diode Forward Voltage

THERMAL RATINGS

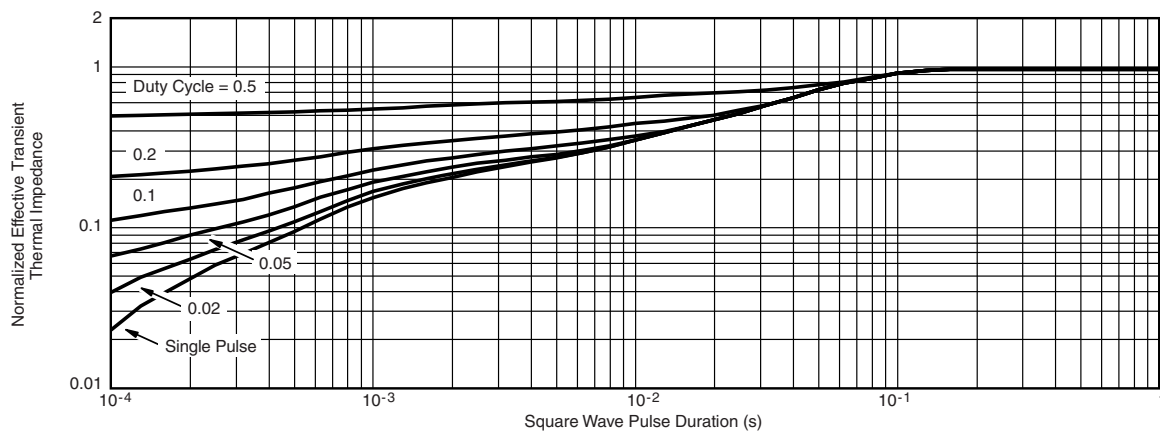


Max. Avalanche and Drain Current vs. Case Temperature



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

Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case

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