

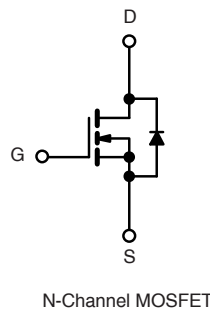
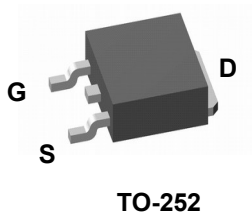
N-Channel PowerTrench[®] MOSFET

100V, 15A, 114mΩ

Features

$R_{DS(ON)} = 114\text{ m}\Omega @ V_{GS} = 10\text{V}$

$R_{DS(ON)} = 120\text{m}\Omega @ V_{GS} = 4.5\text{V}$



ABSOLUTE MAXIMUM RATINGS ($T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted)				
Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current ($T_J = 175\text{ }^\circ\text{C}$) ^b	$T_C = 25\text{ }^\circ\text{C}$	I_D	15	A
	$T_C = 125\text{ }^\circ\text{C}$		13	
Pulsed Drain Current		I_{DM}	40	
Continuous Source Current (Diode Conduction)		I_S	3	
Avalanche Current		I_{AS}	3	
Single Pulse Avalanche Energy	$L = 0.1\text{ mH}$	E_{AS}	18	mJ
Maximum Power Dissipation	$T_C = 25\text{ }^\circ\text{C}$	P_D	96 ^b	W
	$T_A = 25\text{ }^\circ\text{C}$		3 ^a	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 175	$^\circ\text{C}$

THERMAL RESISTANCE RATINGS					
Parameter		Symbol	Typical	Maximum	Unit
Junction-to-Ambient ^a	$t \leq 10\text{ s}$	R_{thJA}	15	18	$^\circ\text{C/W}$
	Steady State		40	50	
Junction-to-Case (Drain)		R_{thJC}	0.85	1.1	

Notes:

a. Surface mounted on 1" x 1" FR4 board.

b. See SOA curve for voltage derating.

SPECIFICATIONS (T _J = 25 °C, unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min.	Typ. ^a	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = 250 μA	100			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	1.0		2.5	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 100 V, V _{GS} = 0 V			1	μA
		V _{DS} = 100 V, V _{GS} = 0 V, T _J = 125 °C			50	
		V _{DS} = 100 V, V _{GS} = 0 V, T _J = 175 °C			250	
On-State Drain Current ^b	I _{D(on)}	V _{DS} = 5 V, V _{GS} = 10 V	40			A
Drain-Source On-State Resistance ^b	R _{DS(on)}	V _{GS} = 10 V, I _D = 3 A		0.114		Ω
		V _{GS} = 10 V, I _D = 3 A, T _J = 125 °C		0.120		
		V _{GS} = 10 V, I _D = 3 A, T _J = 175 °C		0.140		
		V _{GS} = 4.5 V, I _D = 3 A		0.120		
Forward Transconductance ^b	g _{fs}	V _{DS} = 15 V, I _D = 3 A		35		S
Dynamic^a						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 25 V, F = 1 MHz		950		pF
Output Capacitance	C _{oss}			120		
Reverse Transfer Capacitance	C _{rss}			60		
Total Gate Charge ^c	Q _g	V _{DS} = 50 V, V _{GS} = 10 V, I _D = 3 A		24	41	nC
Gate-Source Charge ^c	Q _{gs}			8		
Gate-Drain Charge ^c	Q _{gd}			12		
Gate Resistance	R _g		0.5		2.9	Ω
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = 50 V, R _L = 5.2 Ω I _D = 3 A, V _{GEN} = 10 V, R _g = 2.5 Ω		15	25	ns
Rise Time ^c	t _r			50	75	
Turn-Off Delay Time ^c	t _{d(off)}			30	45	
Fall Time ^c	t _f			60	90	
Source-Drain Diode Ratings and Characteristics (T_C = 25 °C)						
Pulsed Current	I _{SM}				5	A
Diode Forward Voltage ^b	V _{SD}	I _F = 3 A, V _{GS} = 0 V		0.9	1.5	V
Source-Drain Reverse Recovery Time	t _{rr}	I _F = 3 A, dI/dt = 100 A/μs		180	250	ns

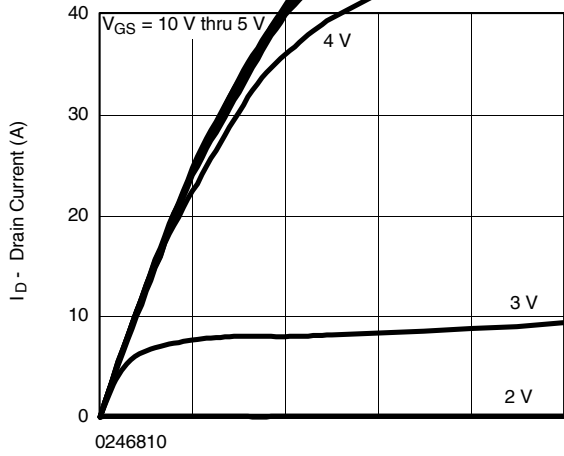
Notes:

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

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

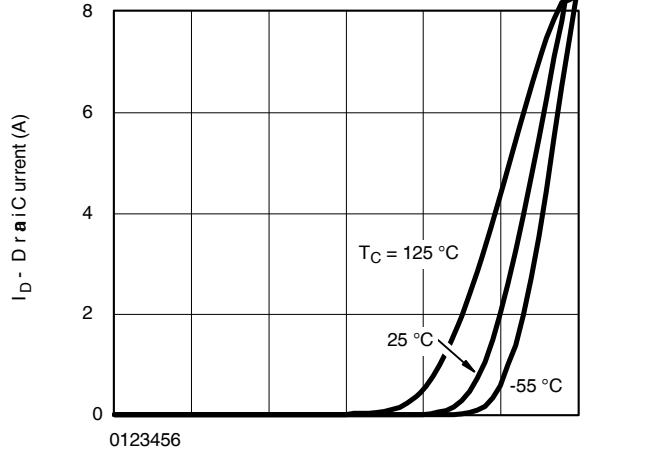
c. Independent of operating temperature.

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



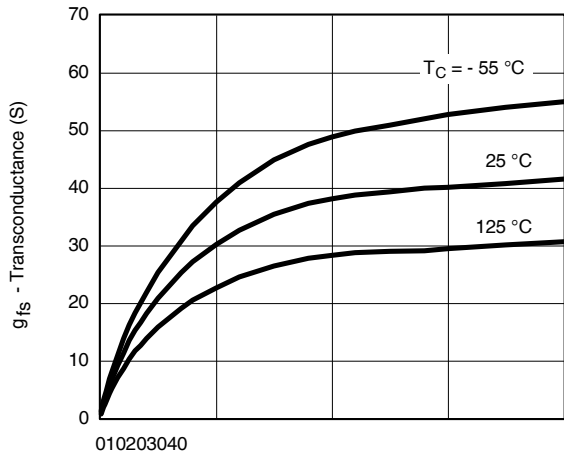
V_{DS} - Drain-to-Source Voltage (V)

Output Characteristics



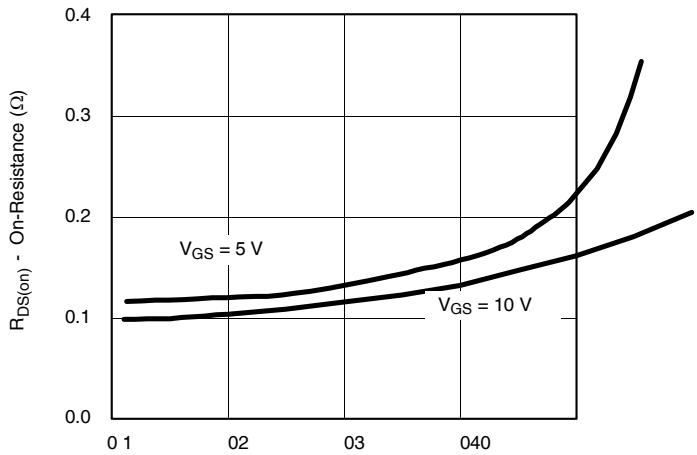
V_{GS} - Gate-to-Source Voltage (V)

Transfer Characteristics



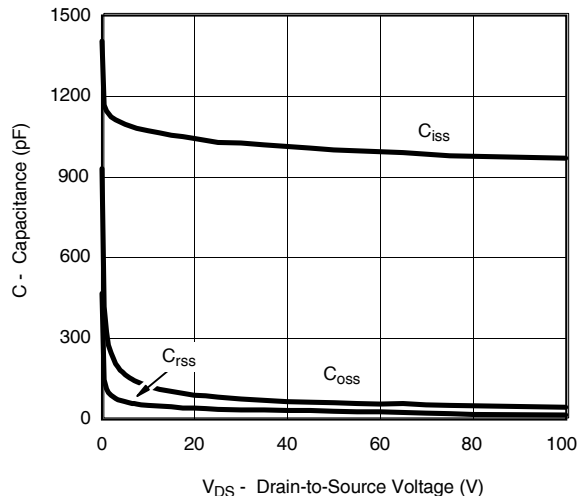
I_D - Drain Current (A)

Transconductance



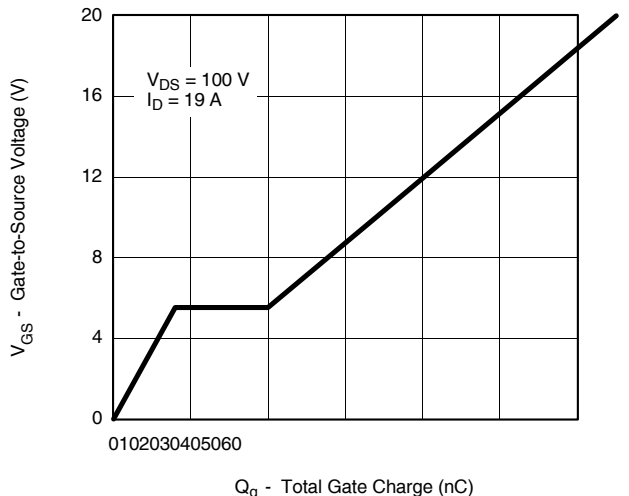
I_D - Drain Current (A)

On-Resistance vs. Drain Current



V_{DS} - Drain-to-Source Voltage (V)

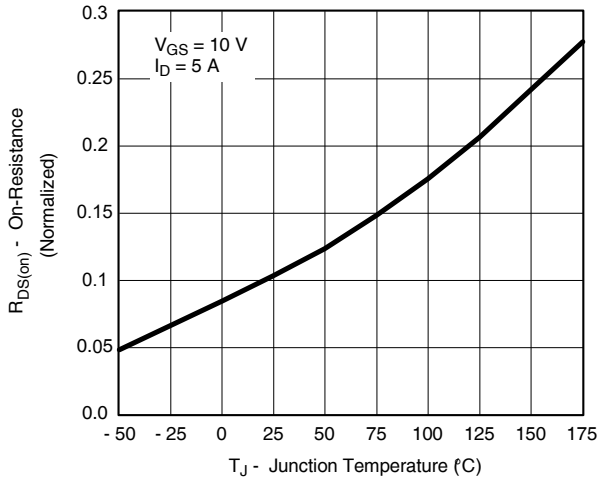
Capacitance



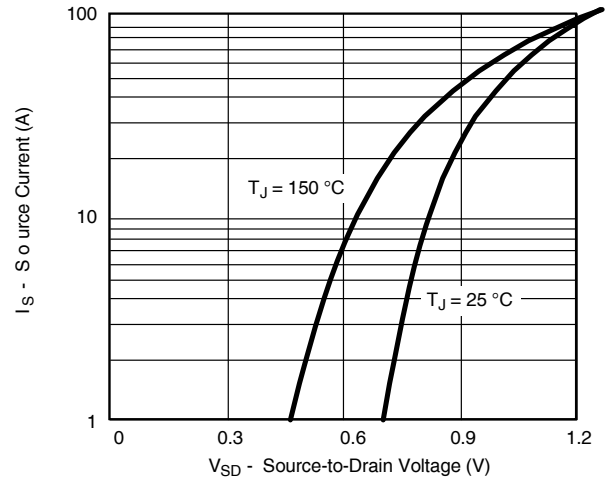
Q_g - Total Gate Charge (nC)

Gate Charge

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

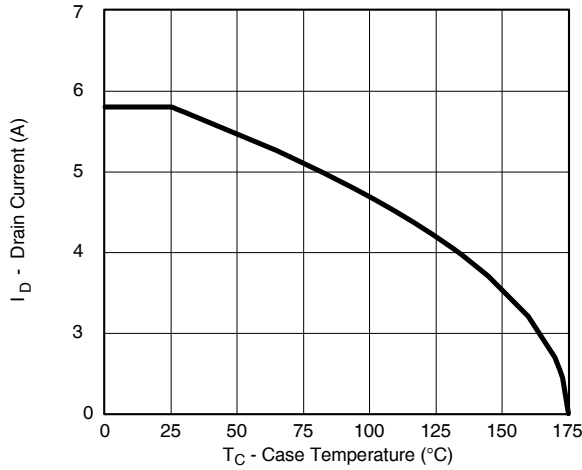


On-Resistance vs. Junction Temperature

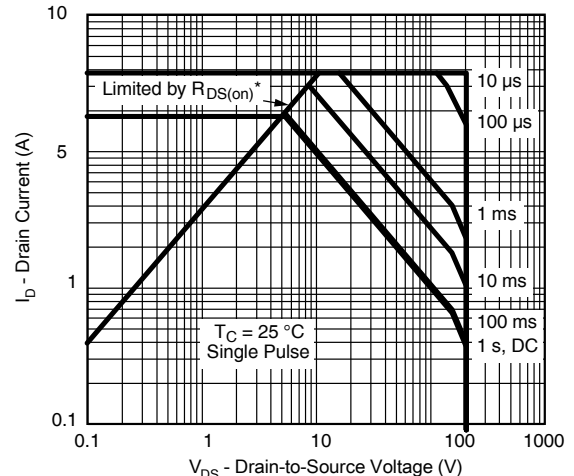


Source-Drain Diode Forward Voltage

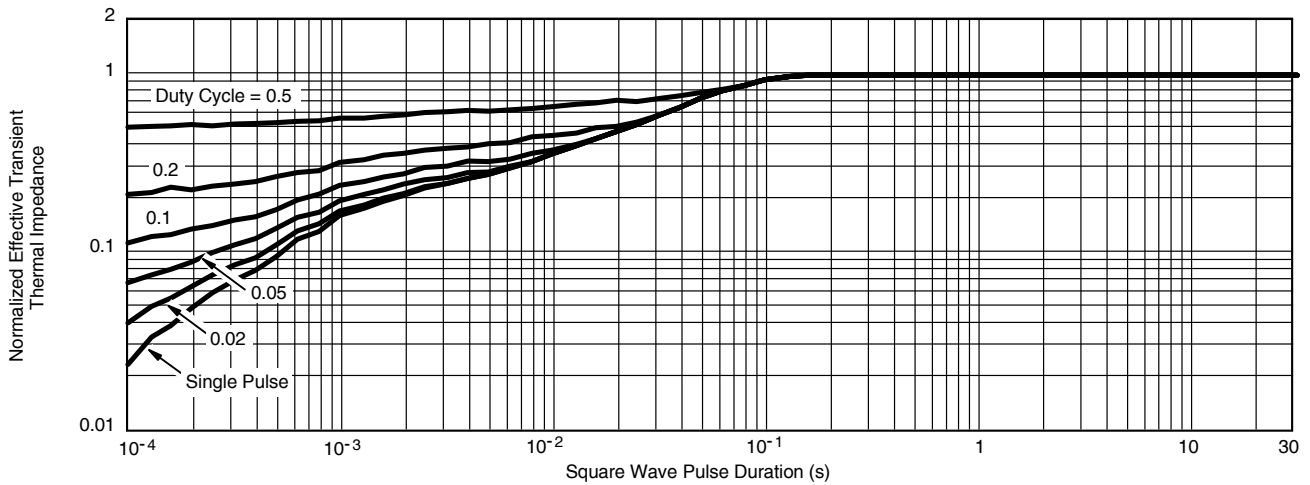
THERMAL RATINGS



Maximum Avalanche Drain Current vs. Case Temperature



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case