

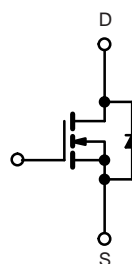
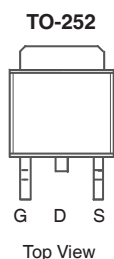
N-Channel 60 V (D-S) Super Junction Power MOSFET

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A) ^a
60	0.0023 at $V_{GS} = 10$ V	120
	0.0049 at $V_{GS} = 4.5$ V	75

FEATURES

- DT-Trench Power MOSFET
- 100 % R_g and UIS Tested


RoHS
 COMPLIANT


N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ($T_C = 25$ °C, unless otherwise noted)

Parameter		Symbol	Limit	Unit
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current ($T_J = 175$ °C) ^b	$T_C = 25$ °C	I_D	120	A
	$T_C = 100$ °C		85 ^a	
Pulsed Drain Current		I_{DM}	480	
Continuous Source Current (Diode Conduction)		I_S	110 ^a	
Avalanche Current		I_{AS}	120	
Single Avalanche Energy (Duty Cycle ≤ 1 %)	$L = 0.1$ mH	E_{AS}	288	mJ
Maximum Power Dissipation	$T_C = 25$ °C	P_D	205	W
	$T_A = 25$ °C		5.6 ^b	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 175	°C

THERMAL RESISTANCE RATINGS

Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^a	$t \leq 10$ sec	R_{thJA}	9	15	°C/W
	Steady State		15	45	
Maximum Junction-to-Case		R_{thJC}	0.95	1.5	

Notes:

a. Package limited.

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

 c. $t \leq 10$ s.

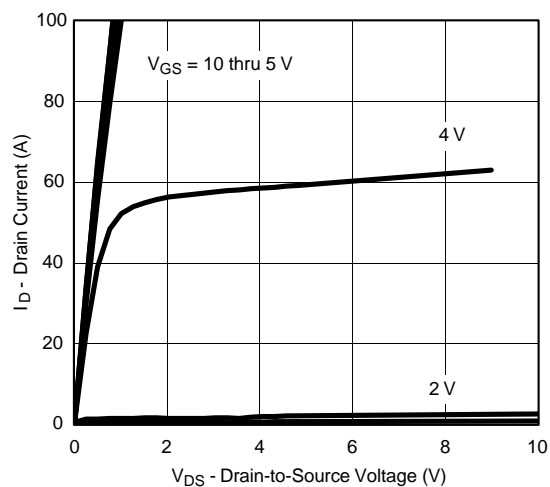
SPECIFICATIONS (T _J = 25 °C, unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min.	Typ. ^a	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = 250 μA	60			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	1	-	3	
Gate-Body Leakage	I _{GSS}	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			250	
On-State Drain Current ^b	I _{D(on)}	V _{DS} = 5 V, V _{GS} = 10 V	150			A
Drain-Source On-State Resistance ^b	R _{DS(on)}	V _{GS} = 10 V, I _D = 20 A		0.0023	0.0033	Ω
		V _{GS} = 10 V, I _D =20 A, T _J = 125 °C		0.0032	0.0040	
		V _{GS} = 10 V, I _D =15 A, T _J = 175 °C		0.0039	0.0048	
		V _{GS} = 4.5 V, I _D = 15 A		0.0049	0.0062	
Forward Transconductance ^b	g _{fs}	V _{DS} = 48 V, I _D = 20 A		165		S
Dynamic						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 48 V, f = 1 MHz		10100		pF
Output Capacitance	C _{oss}			1588		
Reverse Transfer Capacitance	C _{rss}			157		
Total Gate Charge ^c	Q _g	V _{DS} = 48 V, V _{GS} = 10 V, I _D = 20 A		74	89	nC
Gate-Source Charge ^c	Q _{gs}			15		
Gate-Drain Charge ^c	Q _{gd}			19		
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = 48 V, R _L = 0.6 Ω I _D ≅ 20 A, V _{GEN} = 10 V, R _g = 2.5 Ω		18		ns
Rise Time ^c	t _r			32		
Turn-Off Delay Time ^c	t _{d(off)}			66		
Fall Time ^c	t _f			13		
Source-Drain Diode Ratings and Characteristics (T _C = 25 °C)						
Pulsed Current	I _{SM}				480	A
Diode Forward Voltage	V _{SD}	I _F = 20 A, V _{GS} = 0 V			1.25	V
Reverse Recovery Time	t _{rr}	I _F = 20 A, di/dt = 100 A/μs		73		ns

Notes:

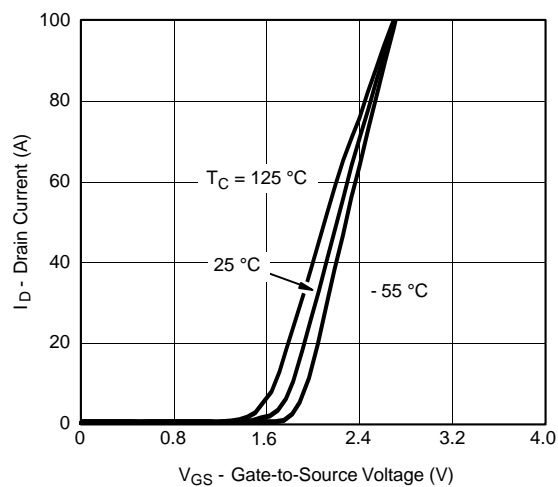
- For design aid only; not subject to production testing.
- Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
- Independent of operating temperature.

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.

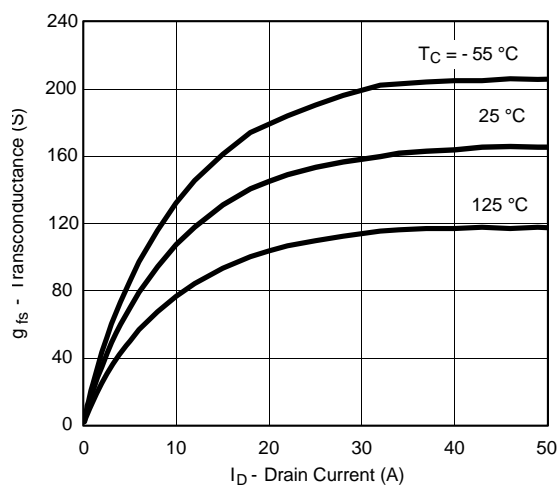
TYPICAL CHARACTERISTICS (25 °C unless noted)



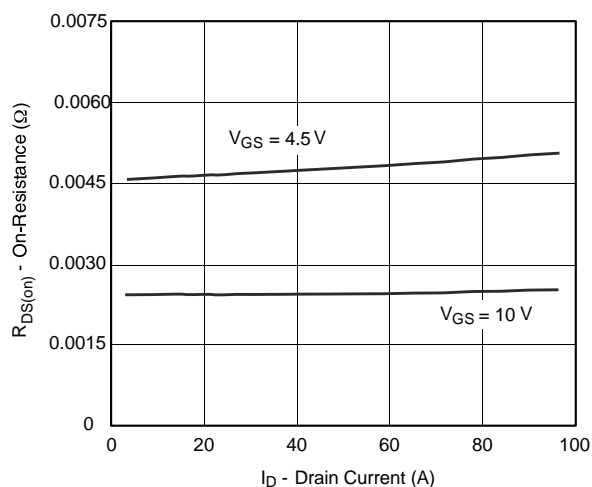
Output Characteristics



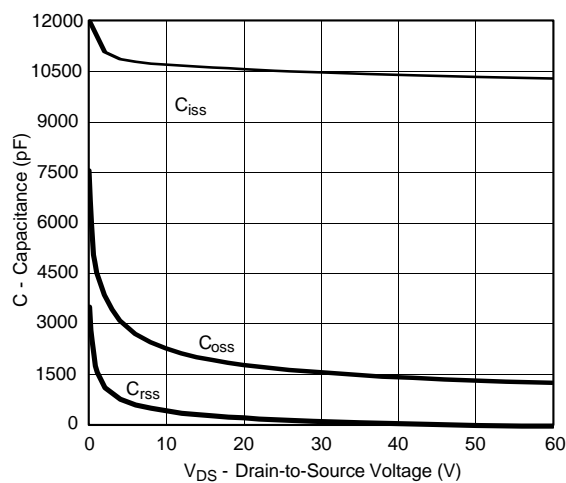
Transfer Characteristics



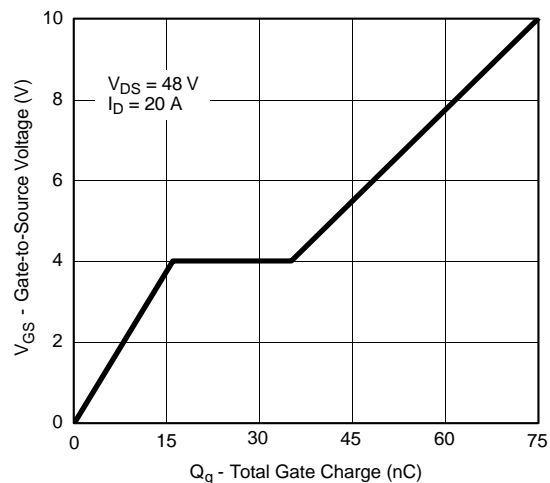
Transconductance



On-Resistance vs. Drain Current

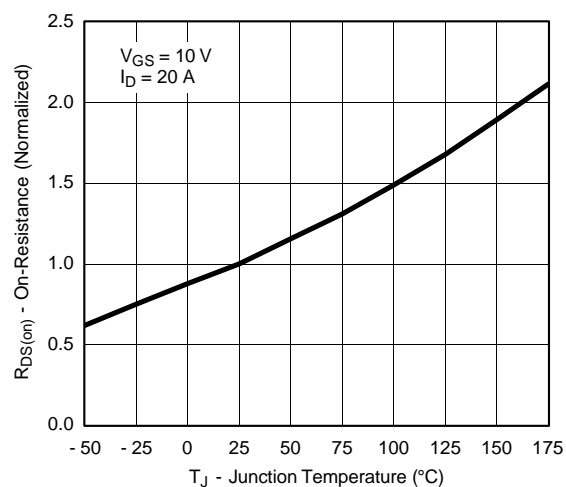


Capacitance

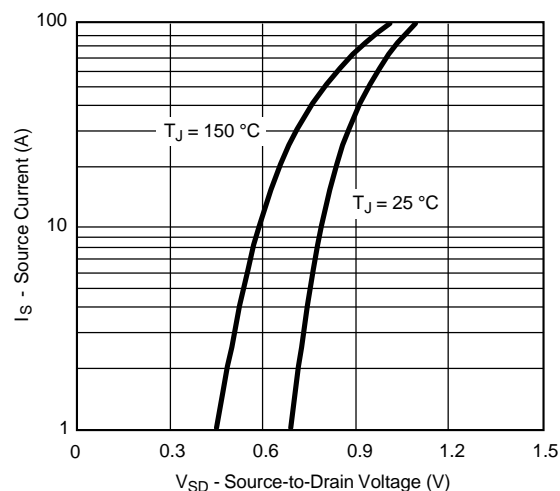


Gate Charge

TYPICAL CHARACTERISTICS (25 °C unless noted)

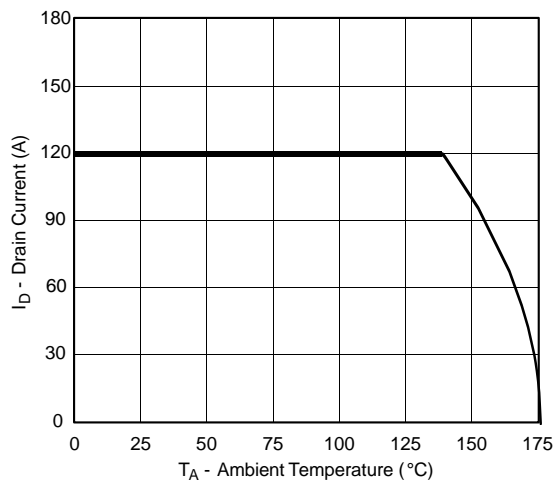


On-Resistance vs. Junction Temperature

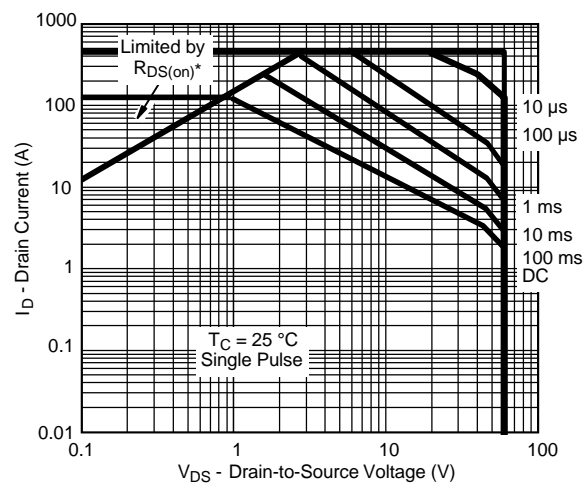


Source-Drain Diode Forward Voltage

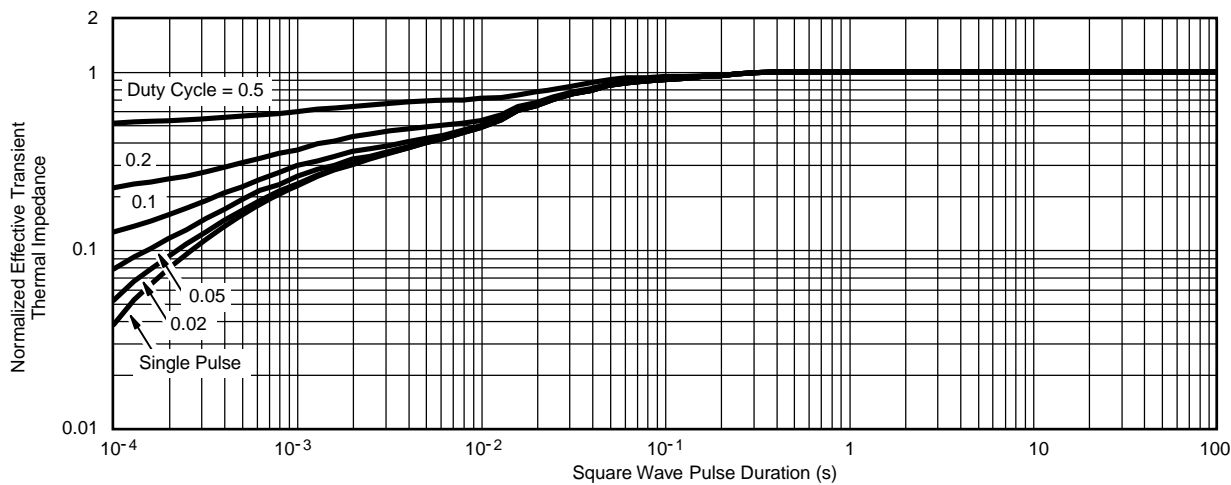
THERMAL RATINGS



Maximum Drain Current vs. Ambient Temperature



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case

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