



P-Channel 40-V (D-S), 175°C MOSFET

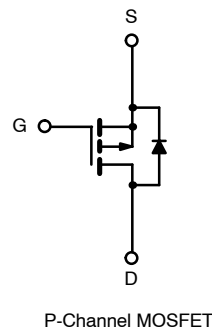
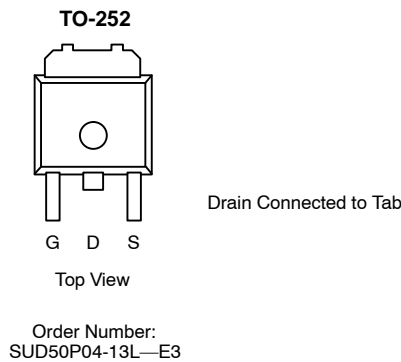
PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
-40	0.013 @ $V_{GS} = -10$ V	-60°
	0.022 @ $V_{GS} = -4.5$ V	-48

FEATURES

- TrenchFET® Power MOSFET
- 175°C Maximum Junction Temperature

APPLICATIONS

- Automotive Such As:
 - High-Side Switch
 - Motor Drive
 - 12-V Boardnet



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)			
Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-40	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current ^b	I_D	$T_C = 25^\circ\text{C}$	-60°
		$T_C = 100^\circ\text{C}$	-43
Pulsed Drain Current	I_{DM}	-100	A
Continuous Source Current (Diode Conduction)	I_S	-60°	
Avalanche Current	I_{AS}	-40	
Avalanche Energy	E_{AS}	80	mJ
Maximum Power Dissipation ^b	P_D	$T_C = 25^\circ\text{C}$	93.7 ^b
		$T_A = 25^\circ\text{C}$	3 ^a
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	R_{thJA}	$t \leq 10$ sec.	15	°C/W
		Steady State	40	
Maximum Junction-to-Case	R_{thJC}	1.3	1.6	

Notes

- Surface Mounted on 1" x 1" FR4 Board.
- See SOA curve for voltage derating.
- Calculated based on maximum allowable Junction Temperature. Package limitation current is 50 A.

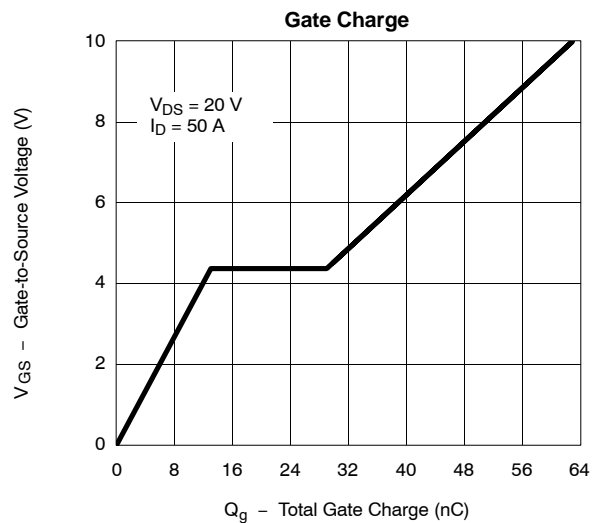
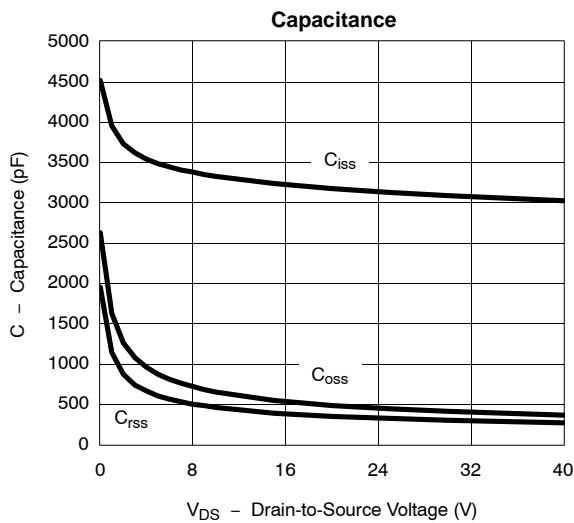
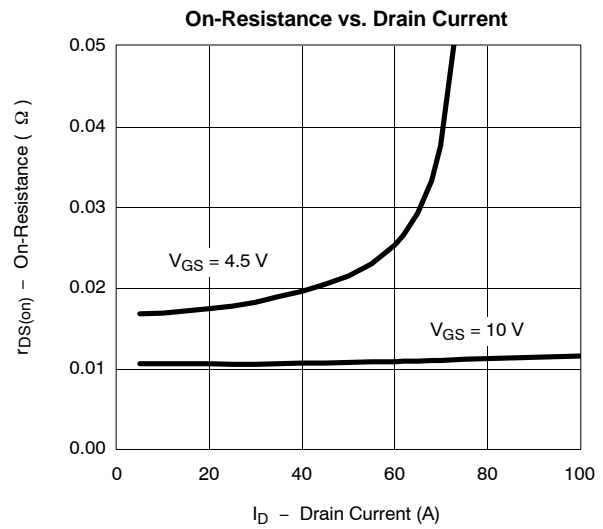
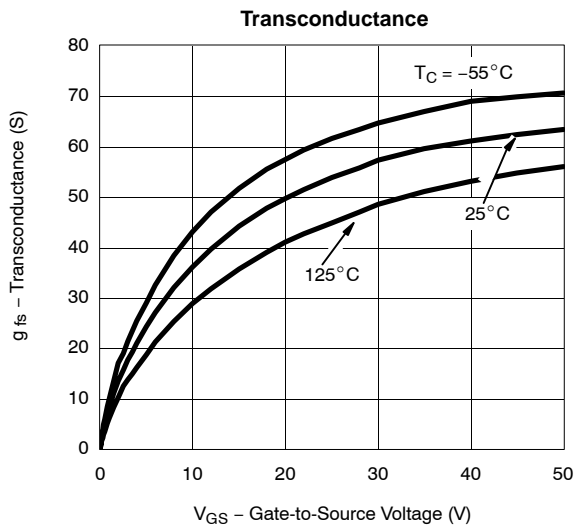
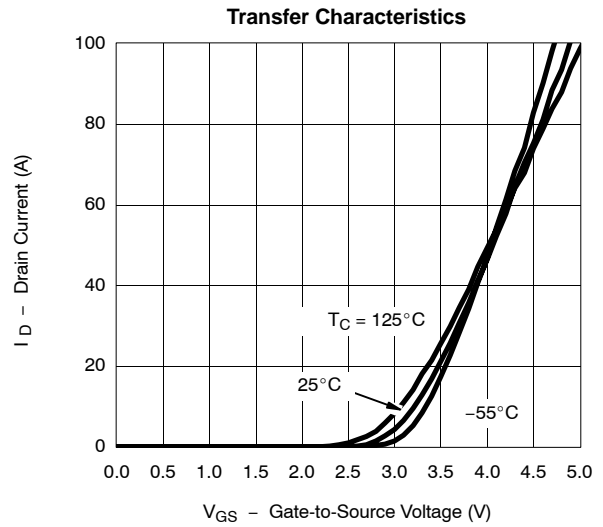
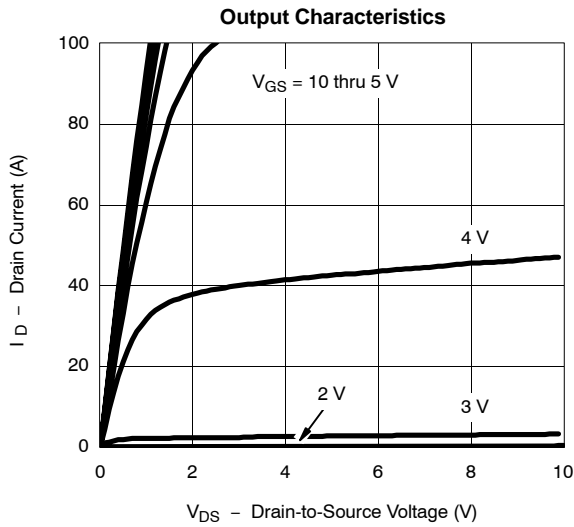
SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = -250\ \mu\text{A}$	-40			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\ \mu\text{A}$	-1.0		-3.0	V
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}	$V_{DS} = -40\text{ V}, V_{GS} = 0\text{ V}$			-1	μA
		$V_{DS} = -40\text{ V}, V_{GS} = 0\text{ V}, T_J = 125^\circ\text{C}$			-50	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} = -5\text{ V}, V_{GS} = -10\text{ V}$	-50			A
Drain-Source On-State Resistance ^a	$r_{DS(on)}$	$V_{GS} = -10\text{ V}, I_D = -30\text{ A}$		0.0105	0.013	Ω
		$V_{GS} = -10\text{ V}, I_D = -30\text{ A}, T_J = 125^\circ\text{C}$			0.020	
		$V_{GS} = -4.5\text{ V}, I_D = -20\text{ A}$		0.017	0.022	
Forward Transconductance ^a	g_{fs}	$V_{DS} = -15\text{ V}, I_D = -30\text{ A}$	15			S
Dynamic^b						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = -25\text{ V}, f = 1\text{ MHz}$		3120		pF
Output Capacitance	C_{oss}			440		
Reverse Transfer Capacitance	C_{rss}			320		
Gate Resistance	R_g	$f = 1.0\text{ MHz}$		4.3		Ω
Total Gate Charge ^c	Q_g	$V_{DS} = -20\text{ V}, V_{GS} = -10\text{ V}, I_D = -50\text{ A}$		63	95	nC
Gate-Source Charge ^c	Q_{gs}			13		
Gate-Drain Charge ^c	Q_{gd}			16		
Turn-On Delay Time ^c	$t_{d(on)}$	$V_{DD} = -20\text{ V}, R_L = 0.4\ \Omega$ $I_D \cong -50\text{ A}, V_{GEN} = -10\text{ V}, R_g = 2.5\ \Omega$		15	25	ns
Rise Time ^c	t_r			18	30	
Turn-Off Delay Time ^c	$t_{d(off)}$			60	90	
Fall Time ^c	t_f			47	70	
Source-Drain Diode Ratings and Characteristic ($T_C = 25^\circ\text{C}$)						
Pulsed Current	I_{SM}				-100	A
Diode Forward Voltage ^a	V_{SD}	$I_F = -50\text{ A}, V_{GS} = 0\text{ V}$		-1.0	-1.5	V
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = -50\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		36	55	ns

Notes

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

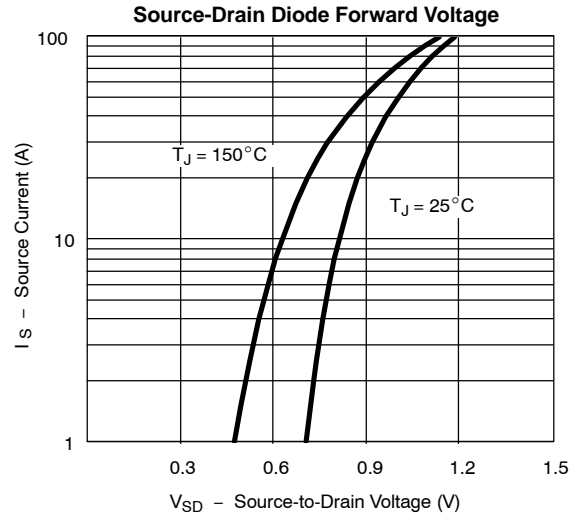
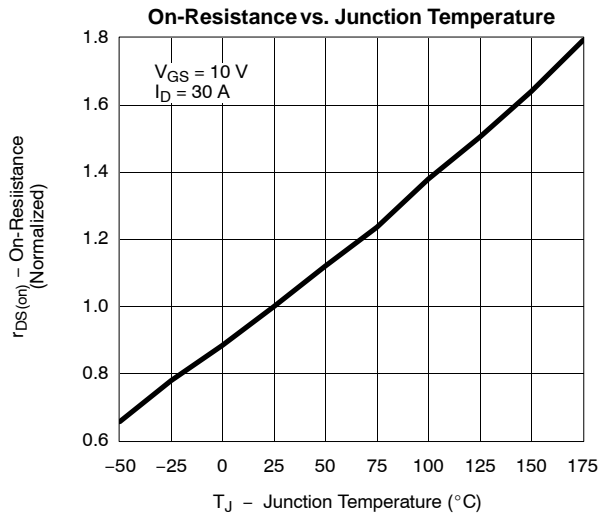


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

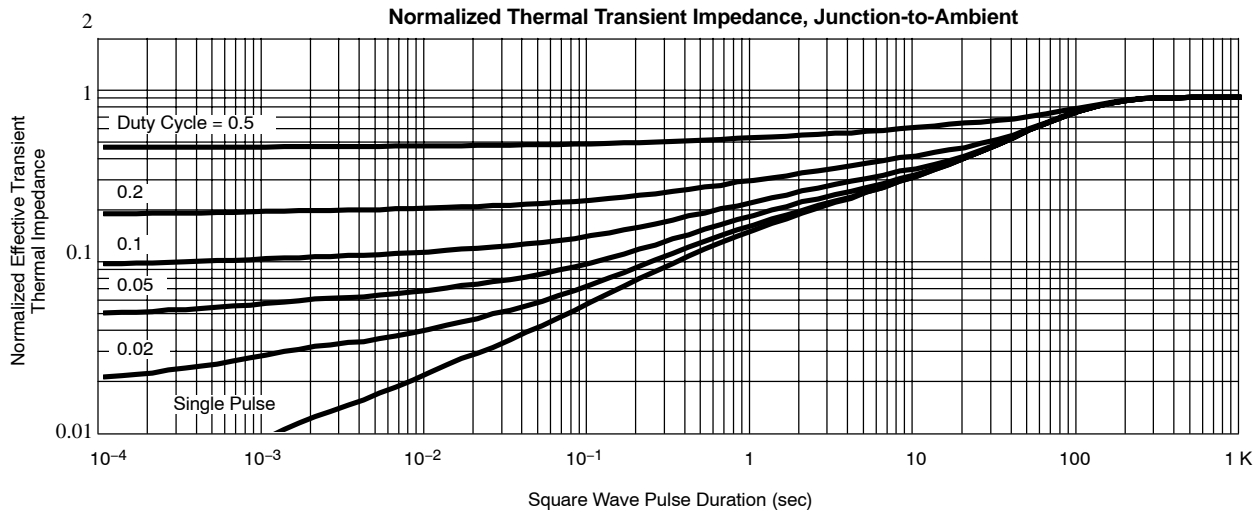
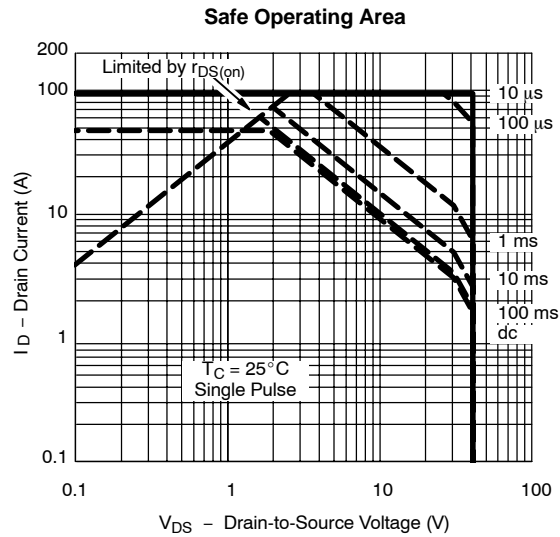
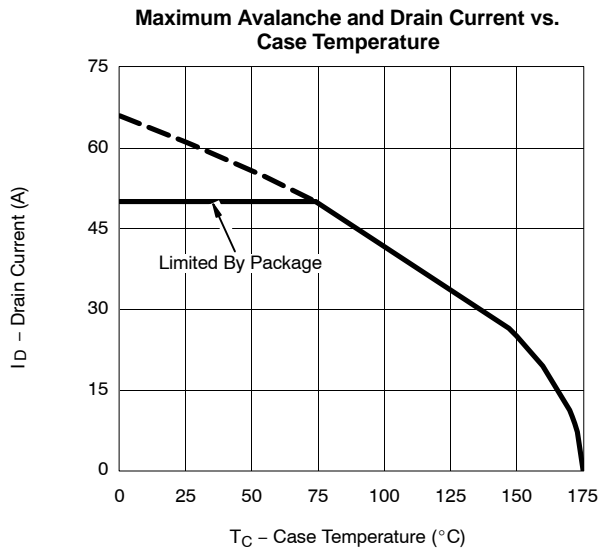




TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)



THERMAL RATINGS





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