

P-Channel 30 V (D-S) MOSFET

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (m Ω)(Typ.)	I_D (A) ^a	Q_g (Typ.)
- 30	1.9 at $V_{GS} = - 10$ V	- 130	140 nC
	2.7 at $V_{GS} = - 4.5$ V		

FEATURES

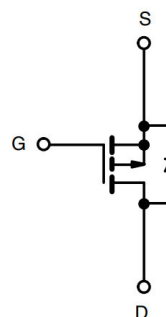
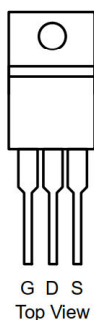
- DT-Trench Power MOSFET
- 100 % R_g and UIS Tested
- Very low on-resistance $R_{DS(on)}$



APPLICATIONS

- Load Switch

TO-220 Pin Configuration



P-Channel MOSFET

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

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V_{DS}	- 30	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current ($T_J = 150$ °C)	I_D	- 130	A
		- 83	
Pulsed Drain Current	I_{DM}	- 390	
Avalanche Current	I_{AS}	- 80	
Single Pulse Avalanche Energy ^a	E_{AS}	250	mJ
Power Dissipation	P_D	168	W
		2.5	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to +150	°C

THERMAL RESISTANCE RATINGS

PARAMETER	SYMBOL	TYPICAL	UNIT
Junction-to-Ambient	R_{thJA}	50	°C/W
Junction-to-Case	R_{thJC}	0.75	

Notes

- a. Duty cycle ≤ 1 %.
 b. When mounted on 1" square PCB (FR4 material).
 c. See SOA curve for voltage derating.

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	- 30			V
V _{DS} Temperature Coefficient	ΔV _{DS} /T	I _D = - 250 μA		- 33		mV/°C
V _{GS(th)} Temperature Coefficient	ΔV _{GS(th)} /T _J			5.6		
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = - 250 μA	- 1		- 3	V
Gate-Source Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = - 30 V, V _{GS} = 0 V			- 1	μA
		V _{DS} = - 24 V, V _{GS} = 0 V, T _J = 55 °C			- 10	
On-State Drain Current ^a	I _{D(on)}	V _{DS} = - 5 V, V _{GS} = - 10 V	- 130			A
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = - 10 V, I _D = - 20 A		1.9	2.5	mΩ
		V _{GS} = - 4.5 V, I _D = - 20 A		2.7	3.6	
Forward Transconductance ^a	g _{fs}	V _{DS} = - 5 V, I _D = -20 A		98		S
Dynamic ^b						
Input Capacitance	C _{iSS}	V _{DS} = - 15 V, V _{GS} = 0 V, f = 1 MHz		12300		pF
Output Capacitance	C _{oSS}			1310		
Reverse Transfer Capacitance	C _{rSS}			1560		
Total Gate Charge	Q _g	V _{DS} = - 15 V, V _{GS} = - 10 V, I _D = - 20 A		140		nC
Gate-Source Charge	Q _{gs}			36		
Gate-Drain Charge	Q _{gd}			40		
Gate Resistance	R _g	f = 1 MHz		2.1		Ω
Turn-On Delay Time	t _{d(on)}	V _{DD} = - 15 V, I _D = - 20 A, V _{GEN} = - 10 V, R _g = 2.5 Ω		20		ns
Rise Time	t _r			85		
Turn-Off Delay Time	t _{d(off)}			140		
Fall Time	t _f			116		
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I _S	T _C = 25 °C			- 130	A
Pulse Diode Forward Current ^a	I _{SM}				- 390	
Body Diode Voltage	V _{SD}	I _S = - 1 A			- 1.2	V
Body Diode Reverse Recovery Time	t _{rr}	I _F = - 20 A, di/dt = 100 A/μs, T _J = 25 °C		25		ns
Body Diode Reverse Recovery Charge	Q _{rr}			69		nC
Reverse Recovery Fall Time	t _a			23		ns
Reverse Recovery Rise Time	t _b			16		

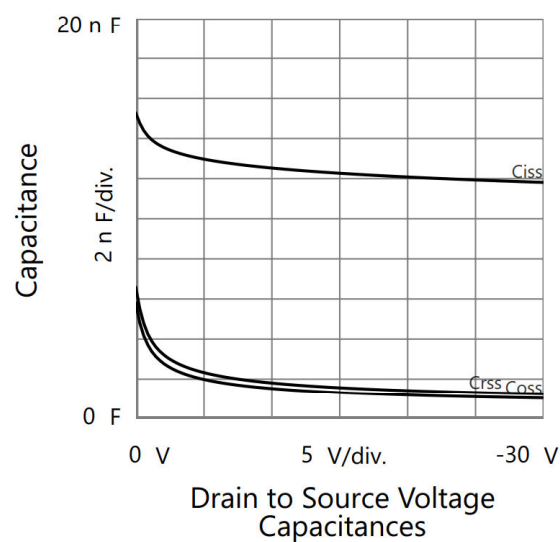
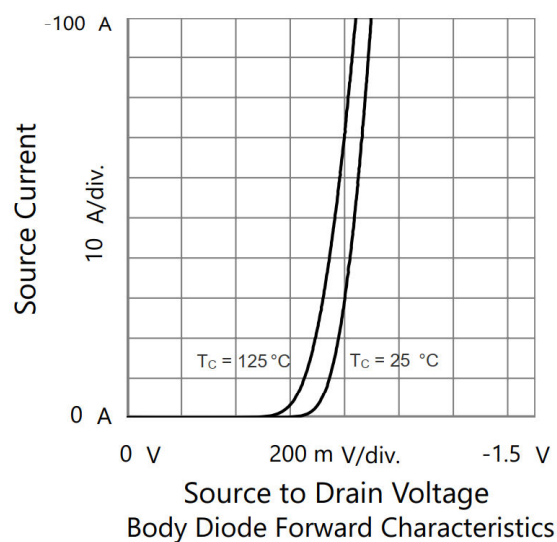
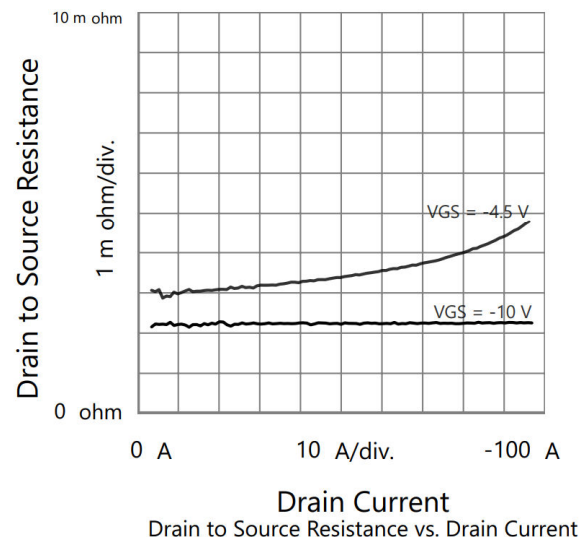
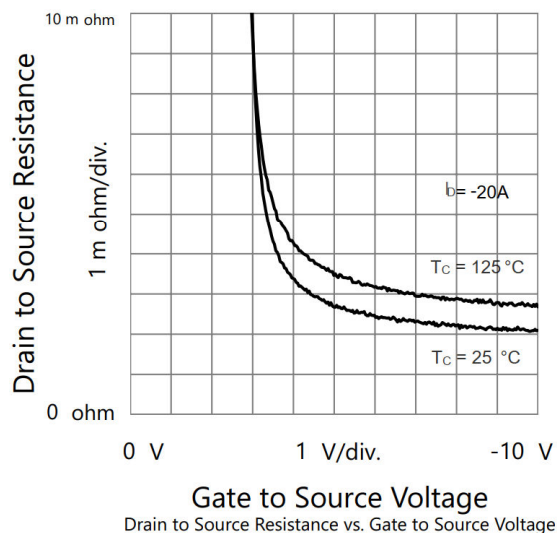
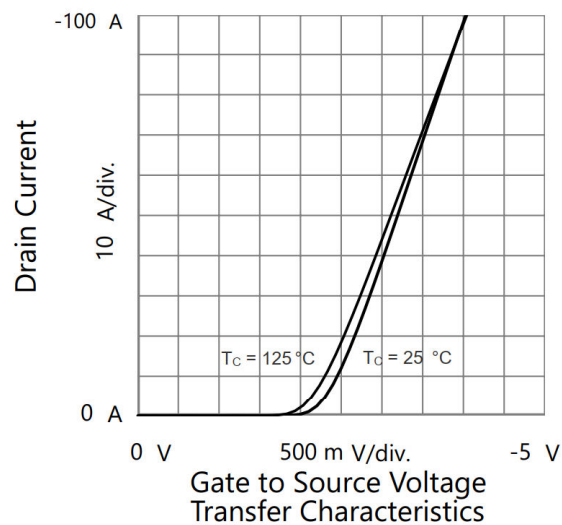
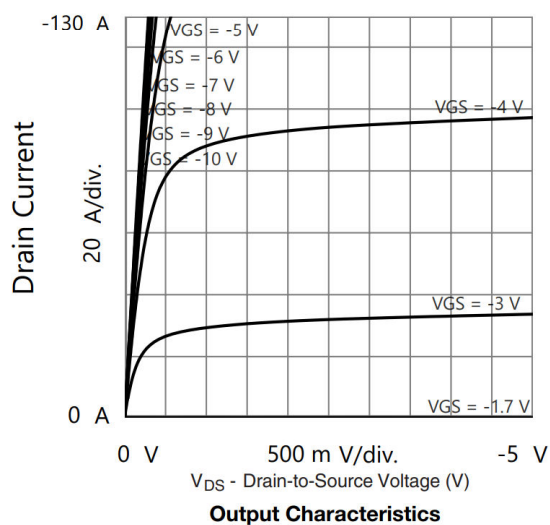
Notes:

a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.

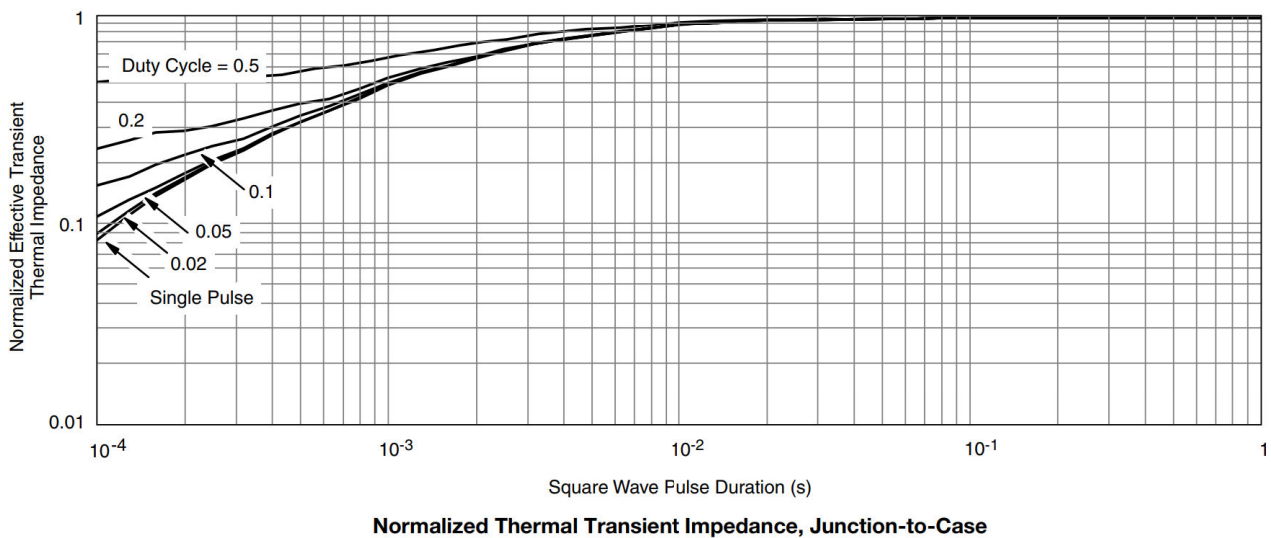
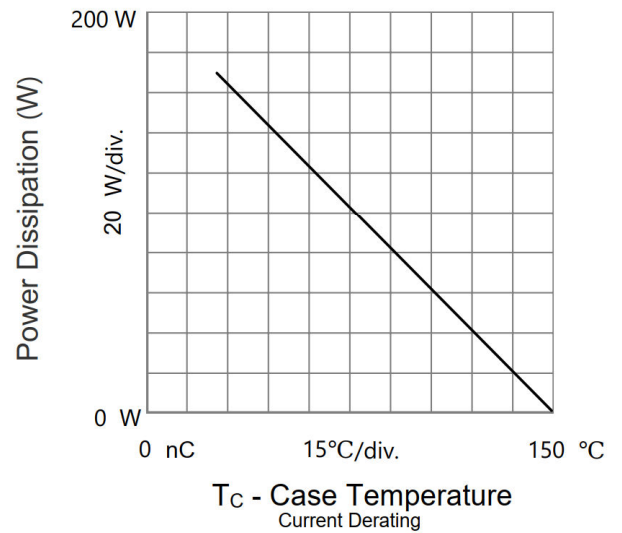
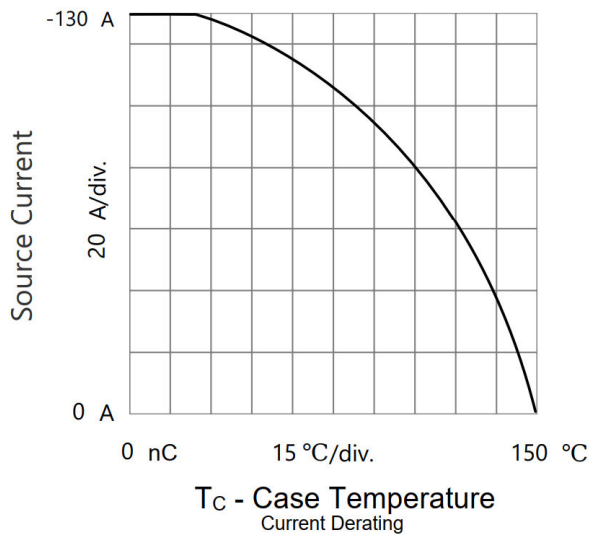
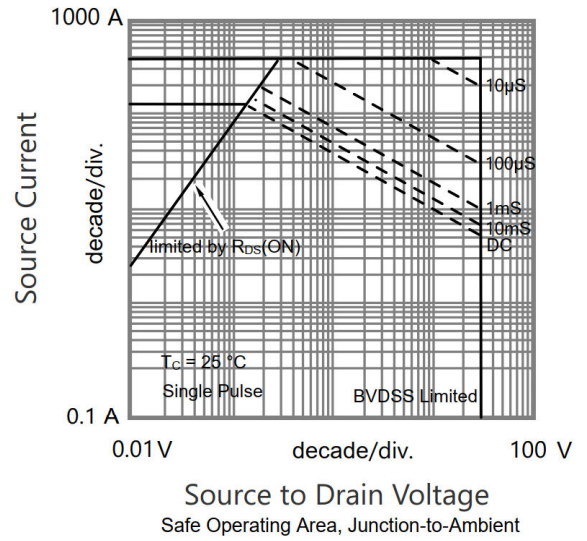
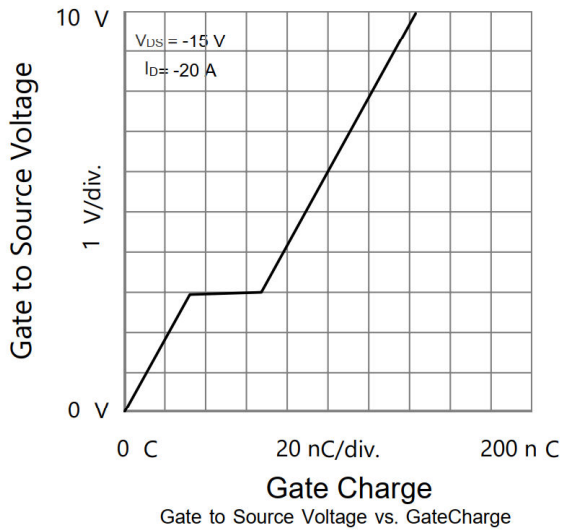
b. Guaranteed by design, not subject to production testing.

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)



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