P-Channel 200 V (D-S) Power MOSFET

PRODUCT SUMMARY			
V_{DS} (V)	$R_{DS(on)}$ (Ω)(Max.)	I_D (A)[a]	Q_g (Max.)
- 200	0.5 at V_{GS} = - 10 V	- 10	32 nC

FEATURES

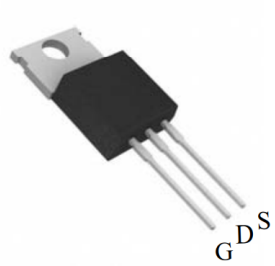
- DT-Trench Power MOSFET
- 100 % UIS Tested
- Fast switching

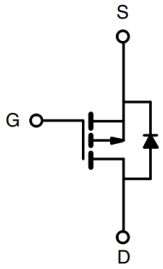
RoHS COMPLIANT

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}	-200	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current [d] (T_J = 175 °C)	T_C = 25 °C	I_D	-10	A
	T_C = 100 °C		-6.6	
Pulsed Drain Current		I_{DM}	-40	
Avalanche Current	L = 0.1 mH	I_{AS}	-38	
Single Pulse Avalanche Energy [a]		E_{AS}	713	mJ
Power Dissipation	T_C = 25 °C [c]	P_D	128	W
	T_A = 25 °C [b]		4.86	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to +175	°C

THERMAL RESISTANCE RATINGS				
PARAMETER		SYMBOL	MAX.	UNIT
Junction-to-Ambient	PCB mount [b]	R_{thJA}	62	°C/W
Junction-to-Case		R_{thJC}	1.0	

Notes

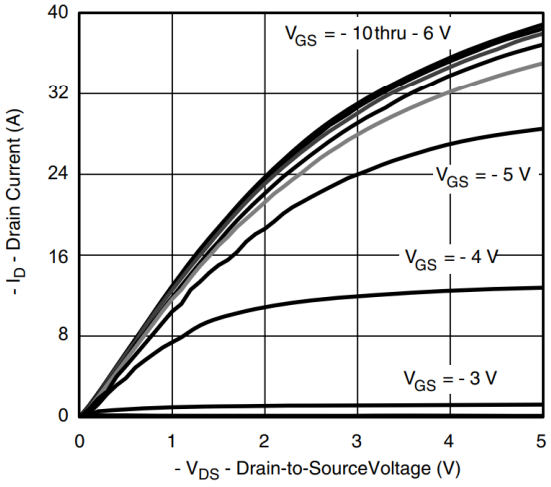
a. Duty cycle ≤ 1 %.
b. When mounted on 1" square PCB (FR4 material).
c. See SOA curve for voltage derating.

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	- 200			V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T$	I_D = - 250 µA		-193		mV/°C
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$			- 5.2		
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = - 250 µA	- 2		- 4	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} = - 200 V, V_{GS} = 0 V			- 100	µA
		V_{DS} = - 160 V, V_{GS} = 0 V, T_J = 125 °C			- 500	
Drain-Source On-State Resistance[a]	$R_{DS(on)}$	V_{GS} = - 10 V, I_D = - 6 A			0.5	Ω
Forward Transconductance[a]	g_{fs}	V_{DS} = - 50 V, I_D = - 6 A	4.5			S
Dynamic[b]						
Input Capacitance	C_{iss}	V_{DS} = - 25 V, V_{GS} = 0 V, f = 1 MHz		1230		pF
Output Capacitance	C_{oss}			390		
Reverse Transfer Capacitance	C_{rss}			85		
Total Gate Charge	Q_g	V_{DS} = - 160 V, V_{GS} = - 10 V, I_D = - 6 A		32	45	nC
Gate-Source Charge	Q_{gs}			6		
Gate-Drain Charge	Q_{gd}			23		
Gate Resistance	R_g	f = 1 MHz		1.2		Ω
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = - 100 V, R_L = 10 Ω I_D = - 6 A, V_{GEN} = - 10 V, R_g = 9 Ω		15		ns
Rise Time	t_r			45		
Turn-Off Delay Time	$t_{d(off)}$			40		
Fall Time	t_f			36		
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	T_C = 25 °C			- 10	A
Pulse Diode Forward Current[a]	I_{SM}				- 40	
Body Diode Voltage	V_{SD}	I_S = - 6 A			- 5	V
Body Diode Reverse Recovery Time	t_{rr}	I_F = - 10 A, di/dt = 100 A/µs, T_J = 25 °C		205	330	ns
Body Diode Reverse Recovery Charge	Q_{rr}			3	4	µC
Reverse Recovery Fall Time	t_a			109		ns
Reverse Recovery Rise Time	t_b			116		

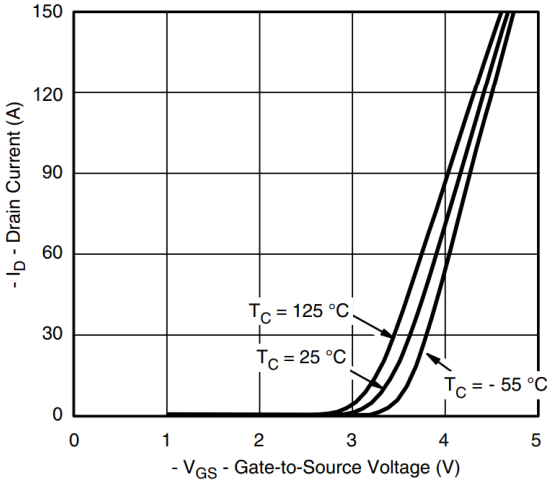
Notes:
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.
b. Guaranteed by design, not subject to production testing.

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.

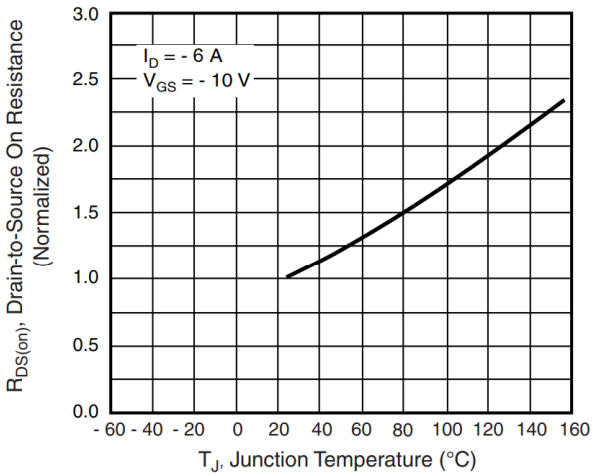
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



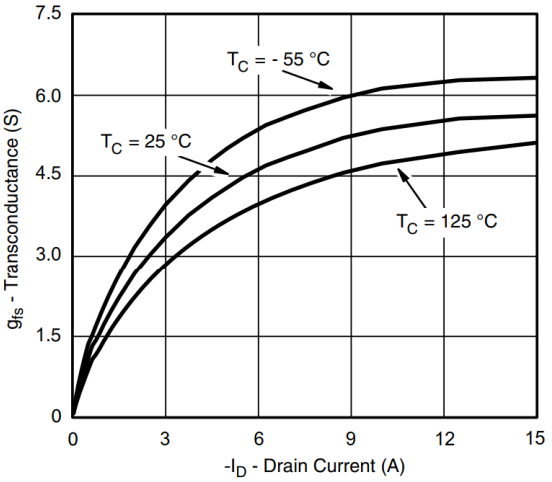
Output Characteristics



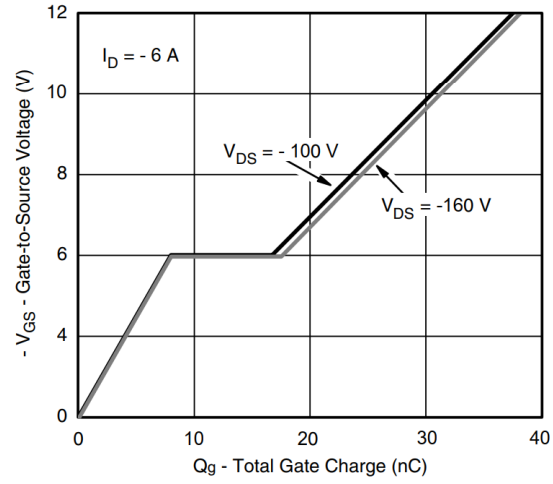
Transfer Characteristics



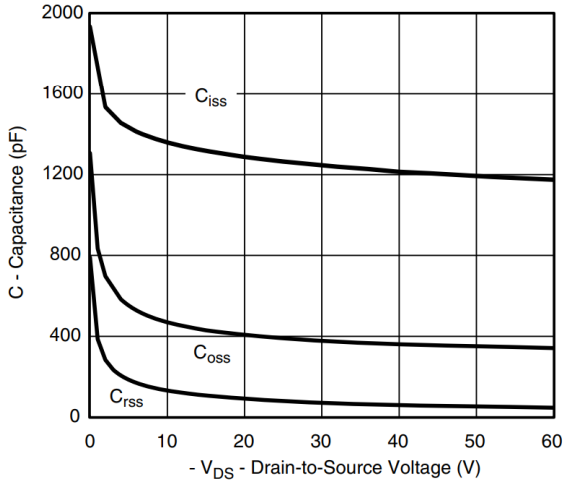
Normalized On-Resistance vs. Temperature



Transconductance

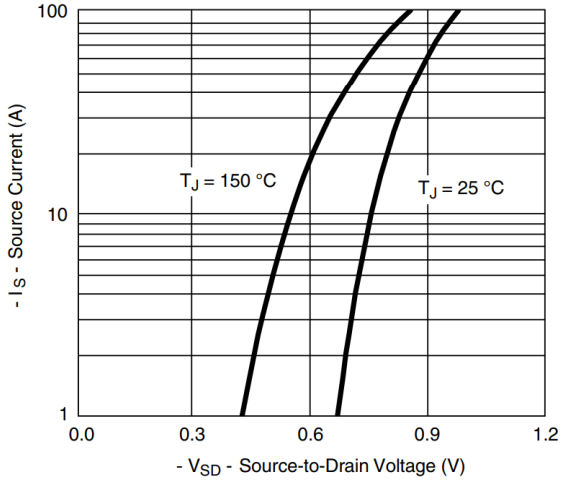


Gate Charge

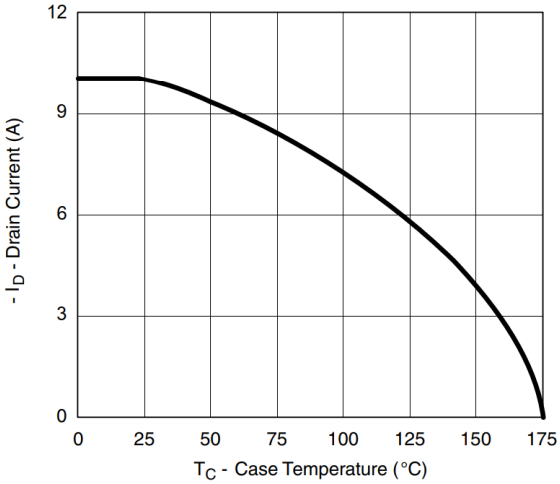


Capacitance

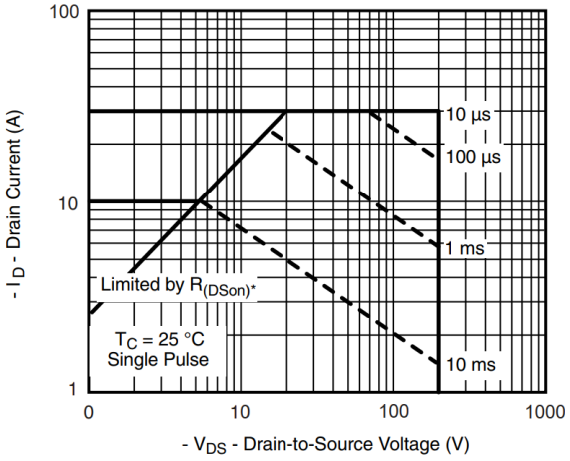
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Source-Drain Diode Forward Voltage

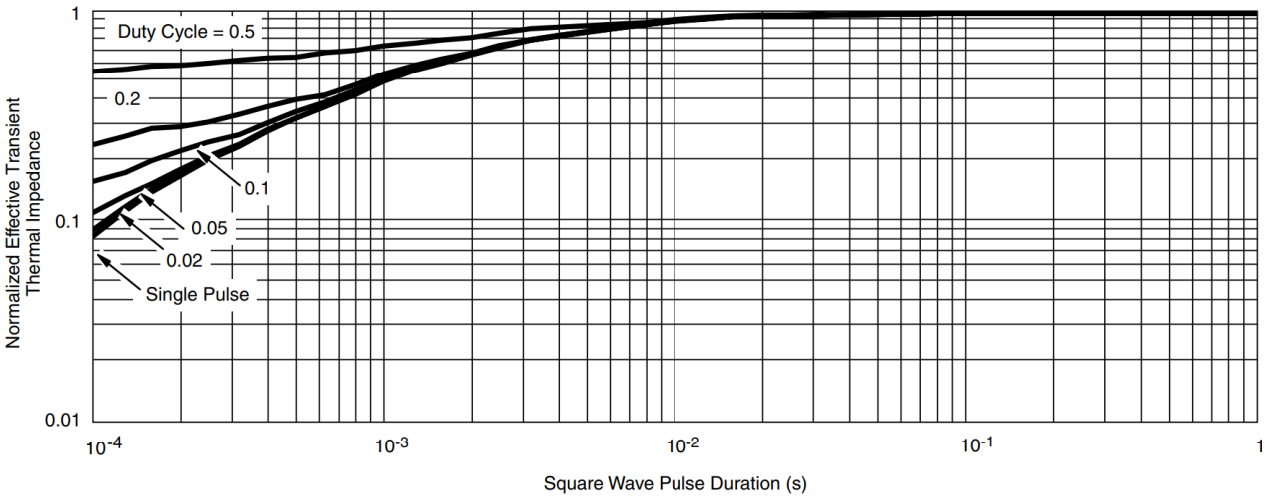


Maximum Avalanche and Drain Current vs. Case Temperature



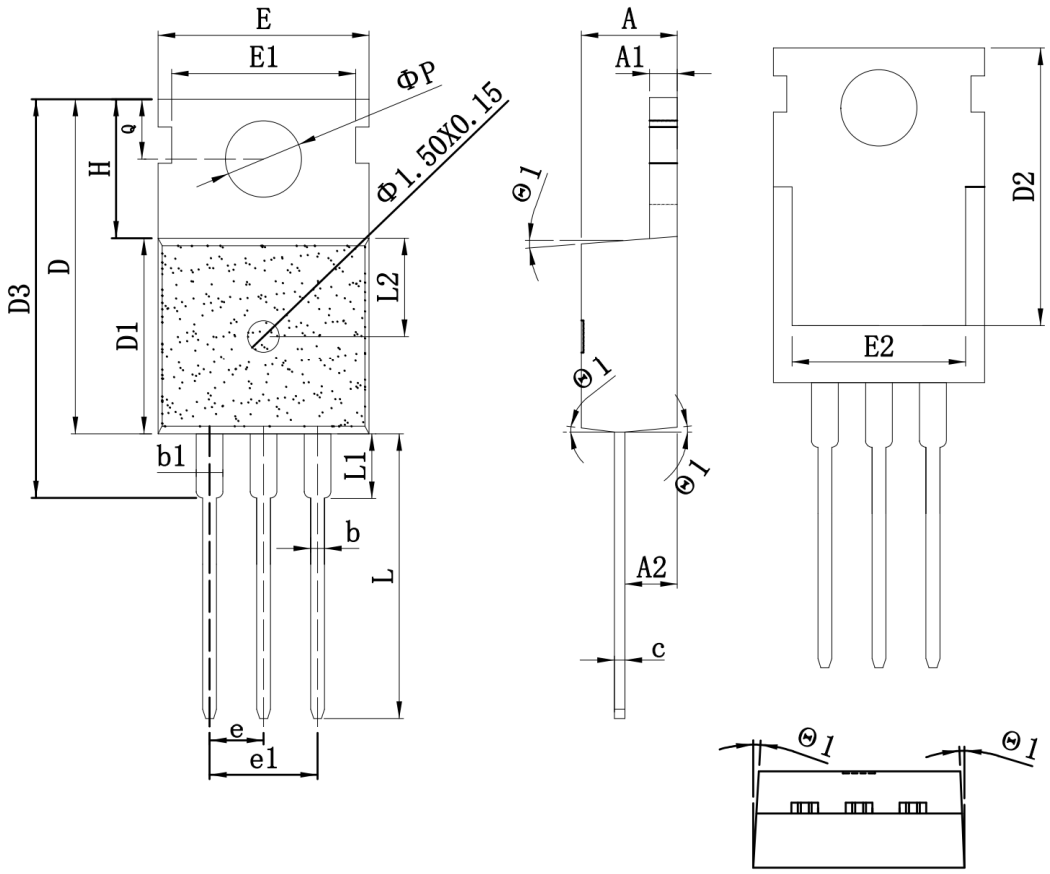
Maximum Safe Operating Area

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Case

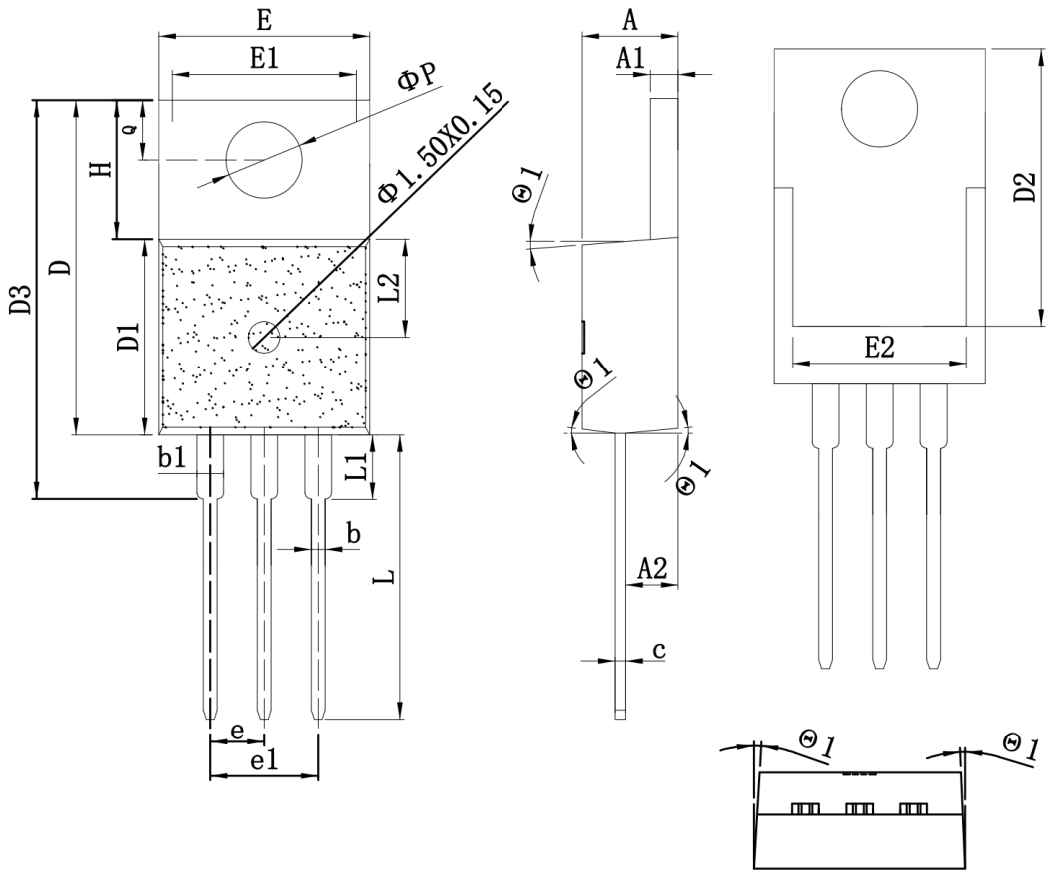
TO-220_3L-A PACKAGE OUTLINE



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	mm			SYMBOL	mm		
	MIN	TYP	MAX		MIN	TYP	MAX
A	4.15	4.50	4.80	E1	8.25	8.70	9.15
A1	1.15	1.30	1.50	E2	7.20	8.00	8.80
A2	2.10	2.40	2.65	e	2.38	2.54	2.74
b	0.65	0.80	1.00	e1	5.08REF		
b1	1.10	1.33	1.80	H	6.20	6.50	6.90
c	0.35	0.50	0.65	L	12.75	13.28	13.70
D	14.25	15.75	16.15	L1	-	-	3.50
D1	8.70	9.20	9.60	L2	2.30	4.65	7.00
D2	12.30	13.10	13.85	ϕP	3.40	3.65	3.85
D3	16.20	18.80	20.60	Q	2.50	2.80	3.00
E	8.68	10.02	11.00	θ	2°	-	7°

TO-220_3L-B PACKAGE OUTLINE



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	mm			SYMBOL	mm		
	MIN	TYP	MAX		MIN	TYP	MAX
A	4.15	4.50	4.80	E1	8.25	8.70	9.15
A1	1.15	1.30	1.50	E2	7.20	8.00	8.80
A2	2.10	2.40	2.65	e	2.38	2.54	2.74
b	0.65	0.80	1.00	e1	5.08REF		
b1	1.10	1.33	1.80	H	6.20	6.50	6.90
c	0.35	0.50	0.65	L	12.75	13.28	13.70
D	14.25	15.75	16.15	L1	-	-	3.50
D1	8.70	9.20	9.60	L2	2.30	4.65	7.00
D2	12.30	13.10	13.85	ϕP	3.40	3.65	3.85
D3	16.20	18.80	20.60	Q	2.50	2.80	3.00
E	8.68	10.02	11.00	θ	2°	-	7°

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