

## P-Channel 250-V (D-S) MOSFET

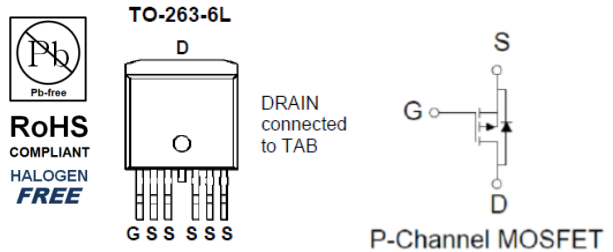
### Key Features:

- Low  $r_{DS(on)}$  trench technology
- Low thermal impedance
- Fast switching speed

### Typical Applications:

- White LED boost converters
- Automotive Systems
- Industrial DC/DC Conversion Circuits

PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ (m $\Omega$ )	$I_D$ (A)
-250	300 @ $V_{GS} = -10V$	-30 <sup>a</sup>
	310 @ $V_{GS} = -6.5V$	



ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ C$ UNLESS OTHERWISE NOTED)				
Parameter		Symbol	Limit	Units
Drain-Source Voltage		$V_{DS}$	-250	V
Gate-Source Voltage		$V_{GS}$	$\pm 20$	
Continuous Drain Current <sup>a</sup>	$T_C=25^\circ C$	$I_D$	-30	A
Pulsed Drain Current <sup>b</sup>		$I_{DM}$	-120	
Continuous Source Current (Diode Conduction) <sup>a</sup>	$T_C=25^\circ C$	$I_S$	-30	A
Power Dissipation <sup>a</sup>	$T_C=25^\circ C$	$P_D$	300	W
Operating Junction and Storage Temperature Range		$T_J, T_{stg}$	-55 to 175	$^\circ C$

THERMAL RESISTANCE RATINGS			
Parameter	Symbol	Maximum	Units
Maximum Junction-to-Ambient <sup>c</sup>	$R_{\theta JA}$	62.5	$^\circ C/W$
Maximum Junction-to-Case	$R_{\theta JC}$	0.5	

### Notes

- Package Limited
- Pulse width limited by maximum junction temperature
- Surface Mounted on 1" x 1" FR4 Board.

## Electrical Characteristics

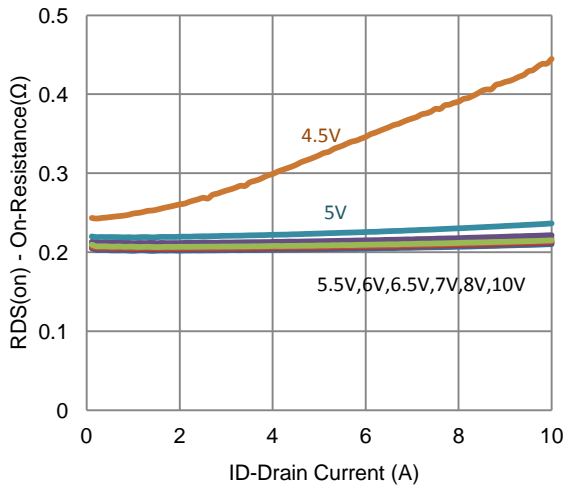
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static</b>						
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250 \mu A$	-1			V
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0 V, V_{GS} = \pm 20 V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -200 V, V_{GS} = 0 V$			-1	uA
		$V_{DS} = -200 V, V_{GS} = 0 V, T_J = 55^\circ C$			-10	
On-State Drain Current <sup>a</sup>	$I_{D(on)}$	$V_{DS} = -5 V, V_{GS} = -10 V$	-37.5			A
Drain-Source On-Resistance <sup>a</sup>	$r_{DS(on)}$	$V_{GS} = -10 V, I_D = -10 A$			300	mΩ
		$V_{GS} = -6.5 V, I_D = -8 A$			310	
Forward Transconductance <sup>a</sup>	$g_{fs}$	$V_{DS} = -15 V, I_D = -10 A$		21		S
Diode Forward Voltage <sup>a</sup>	$V_{SD}$	$I_S = -15 A, V_{GS} = 0 V$		-0.87		V
<b>Dynamic <sup>b</sup></b>						
Total Gate Charge	$Q_g$	$V_{DS} = -100 V, V_{GS} = -6.5 V,$ $I_D = -1 A$		59		nC
Gate-Source Charge	$Q_{gs}$			21		
Gate-Drain Charge	$Q_{gd}$			21		
Turn-On Delay Time	$t_{d(on)}$	$V_{DS} = -100 V, R_L = 100 \Omega,$ $I_D = -1 A,$ $V_{GEN} = -10 V, R_{GEN} = 6 \Omega$		27		ns
Rise Time	$t_r$			19		
Turn-Off Delay Time	$t_{d(off)}$			86		
Fall Time	$t_f$			49		
Input Capacitance	$C_{iss}$	$V_{DS} = -50 V, V_{GS} = 0 V, f = 1 Mhz$		2930		pF
Output Capacitance	$C_{oss}$			104		
Reverse Transfer Capacitance	$C_{rss}$			77		

## Notes

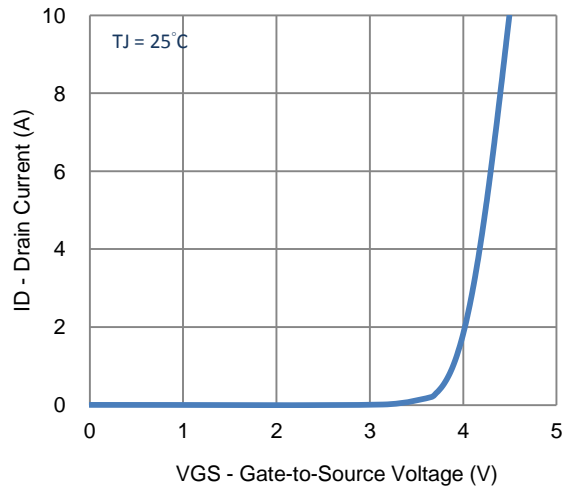
- Pulse test:  $PW \leq 300 \mu s$  duty cycle  $\leq 2\%$ .
- Guaranteed by design, not subject to production testing.

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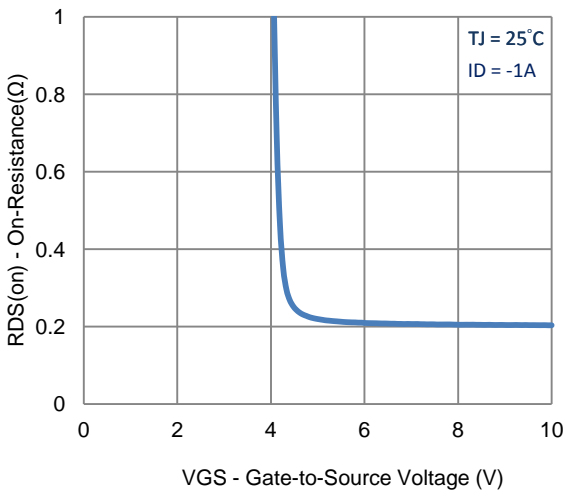
Typical Electrical Characteristics



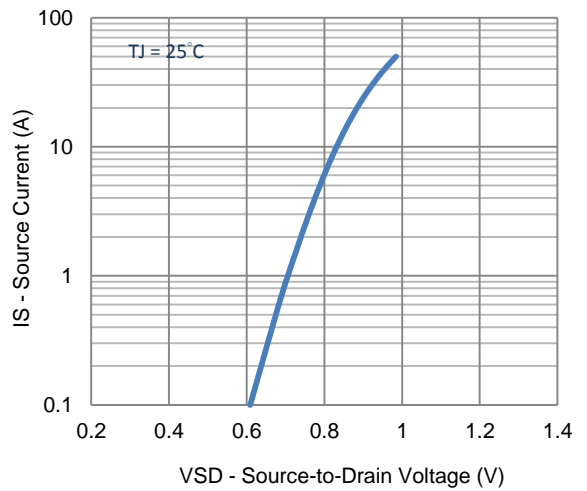
1. On-Resistance vs. Drain Current



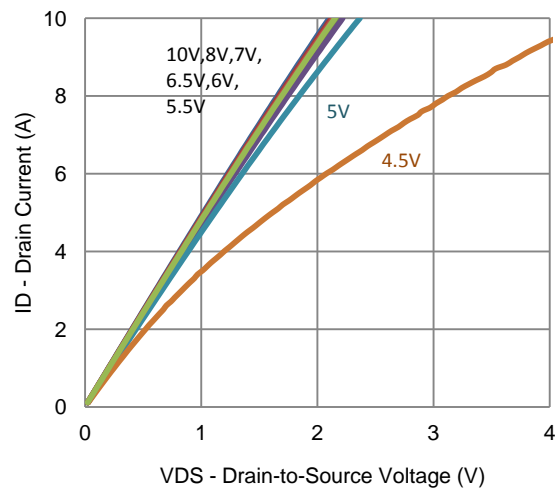
2. Transfer Characteristics



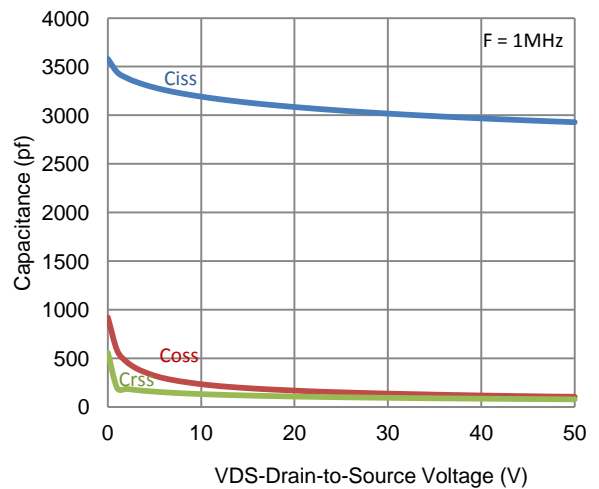
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage

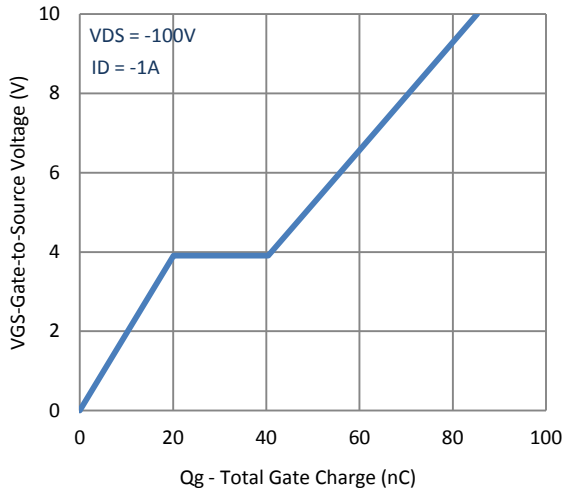


5. Output Characteristics

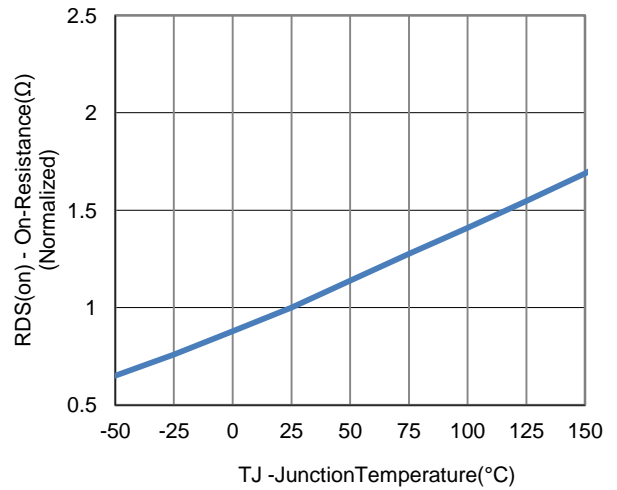


6. Capacitance

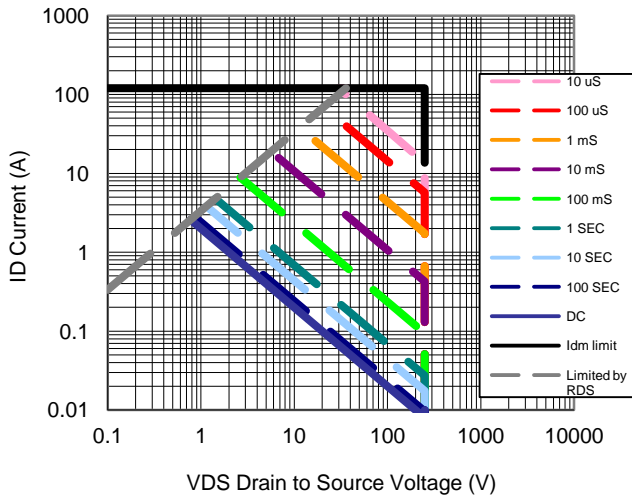
Typical Electrical Characteristics



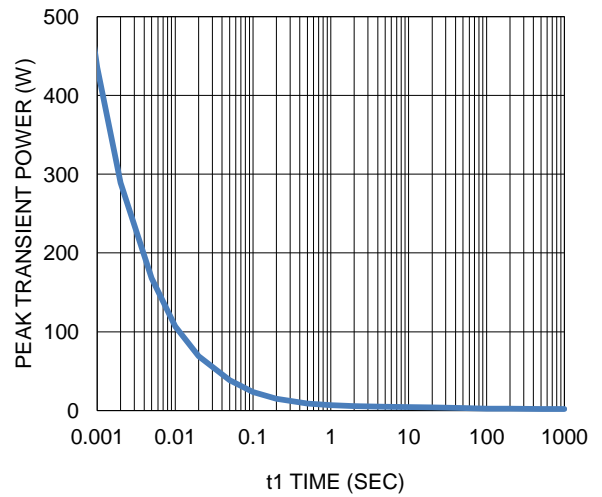
7. Gate Charge



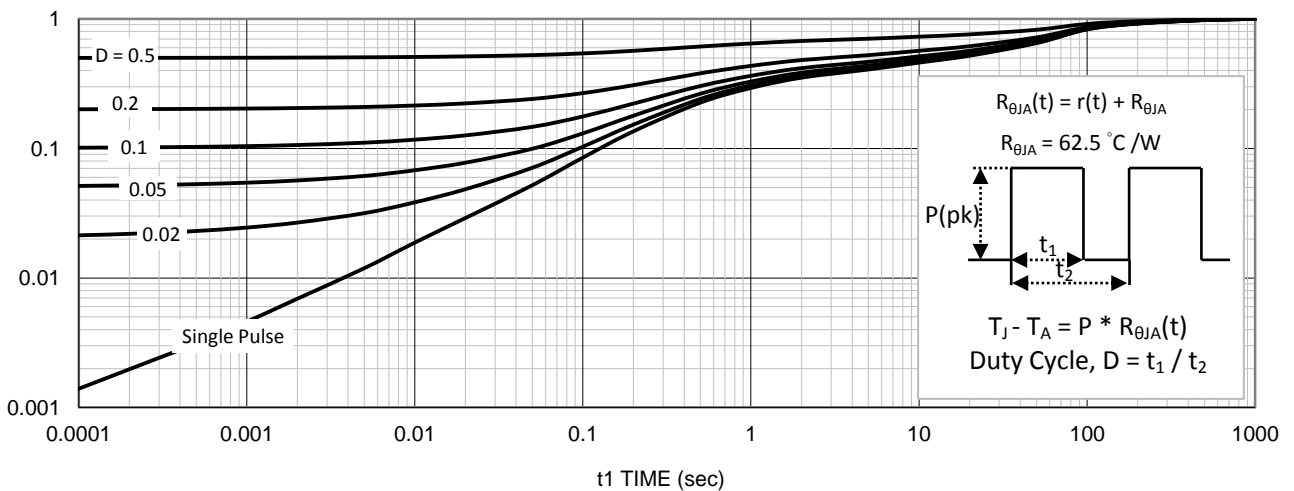
8. Normalized On-Resistance Vs Junction Temperature



9. Safe Operating Area

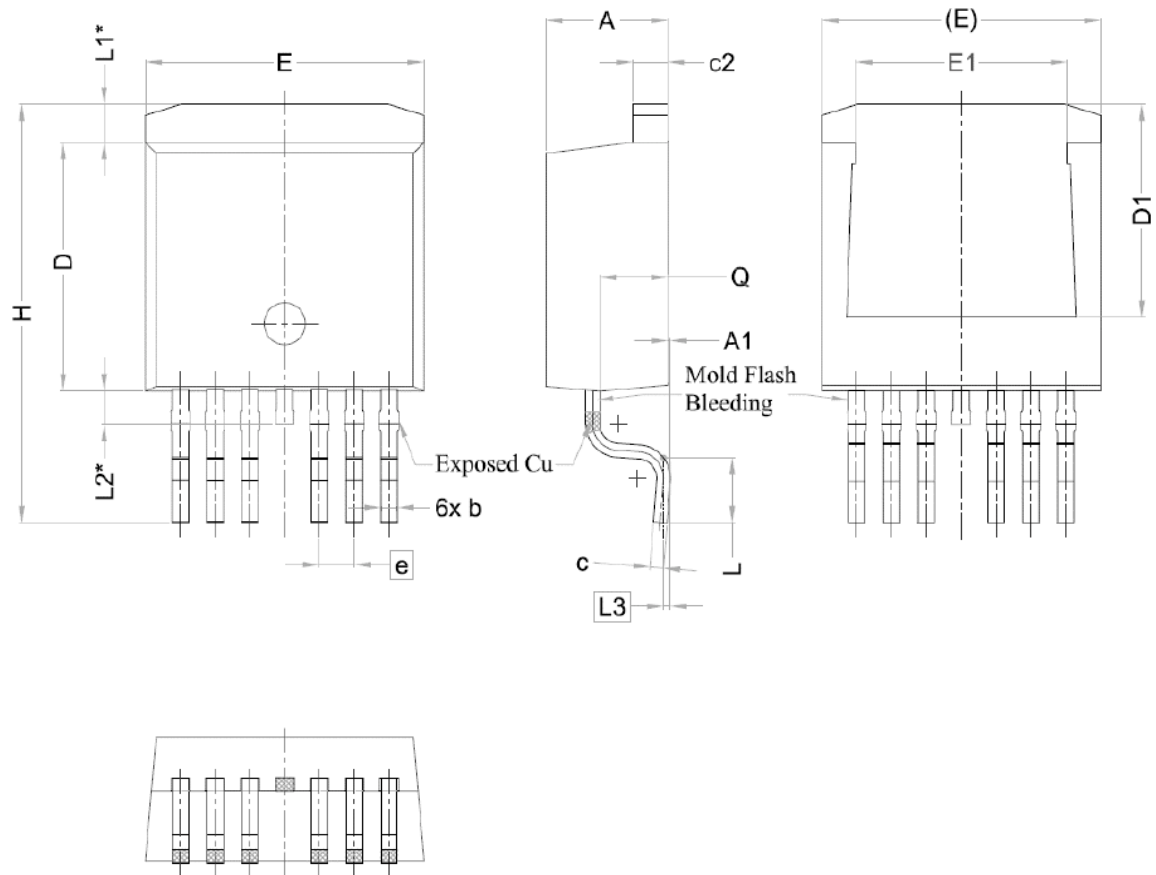


10. Single Pulse Maximum Power Dissipation



11. Normalized Thermal Transient Junction to Ambient

Package Information



SYMBOL	DIMENSIONS		
	MIN.	NOM.	MAX.
A	4.24	4.44	4.64
A1	0.00	0.10	0.25
b	0.50	0.60	0.70
c	0.40	0.50	0.60
c2	1.15	1.27	1.40
D	8.82	8.92	9.02
D1	6.86	7.65	—
E	9.96	10.16	10.36
E1	6.89	7.77	7.89
e	1.27 BSC		
H	14.61	15.00	15.88
L	1.78	2.32	2.79
L1	1.36 REF.		
L2	1.20 REF.		
L3	0.25 BSC		
Q	2.30	2.48	2.70