

## N-Channel 30-V (D-S) MOSFET

### Key Features:

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

### Typical Applications:

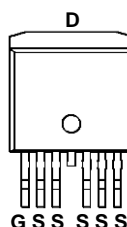
- Automotive Systems
- DC/DC Conversion Circuits
- Battery Powered Power Tools

PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ (m $\Omega$ )	$I_D$ (A)
30	3 @ $V_{GS} = 10V$	260
	4.6 @ $V_{GS} = 4.5V$	210

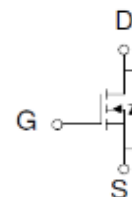


RoHS  
COMPLIANT  
HALOGEN  
FREE

TO-263-6L



DRAIN  
connected  
to TAB



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)				
Parameter		Symbol	Limit	Units
Drain-Source Voltage		$V_{DS}$	30	V
Gate-Source Voltage		$V_{GS}$	$\pm 20$	
Continuous Drain Current <sup>a</sup>	$T_C = 25^\circ\text{C}$	$I_D$	260	A
Pulsed Drain Current <sup>b</sup>		$I_{DM}$	800	
Continuous Source Current (Diode Conduction) <sup>a</sup>	$T_C = 25^\circ\text{C}$	$I_S$	260	A
Power Dissipation <sup>a</sup>	$T_C = 25^\circ\text{C}$	$P_D$	300	W
Operating Junction and Storage Temperature Range		$T_J, T_{stg}$	-55 to 175	$^\circ\text{C}$

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

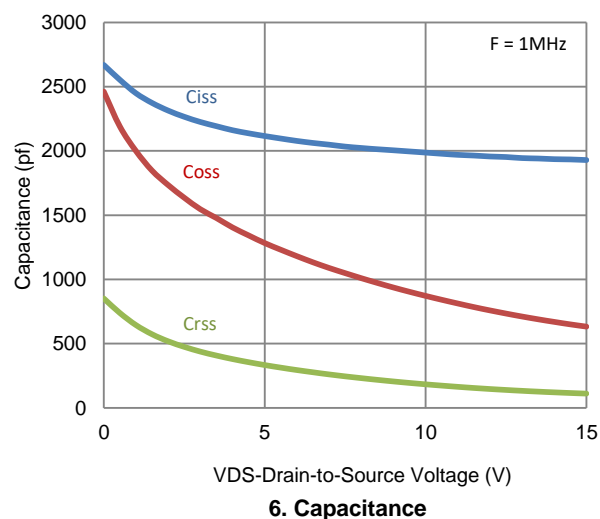
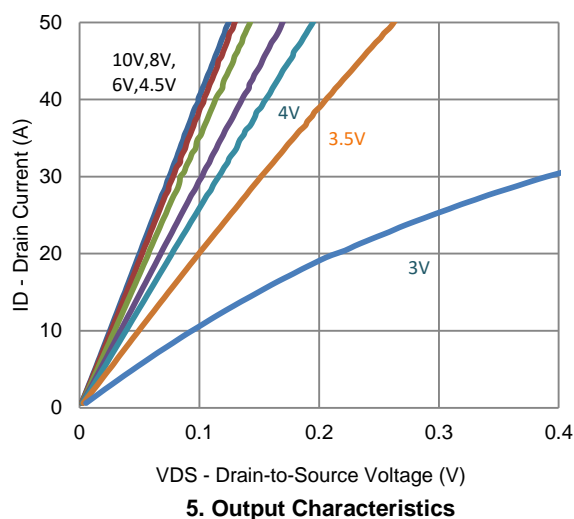
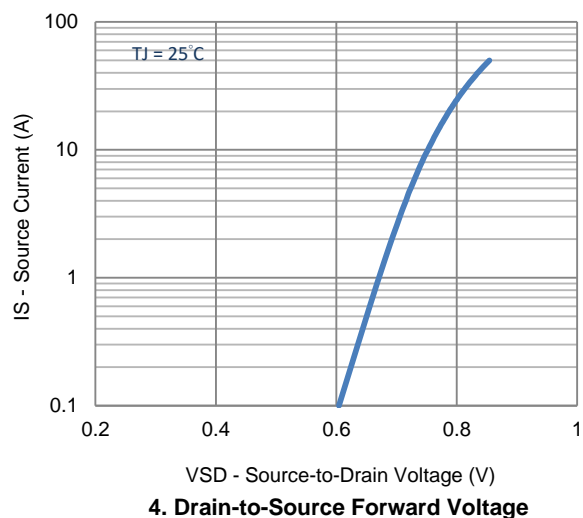
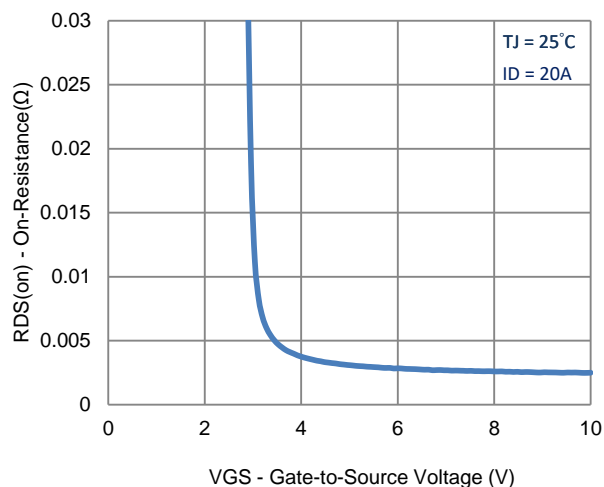
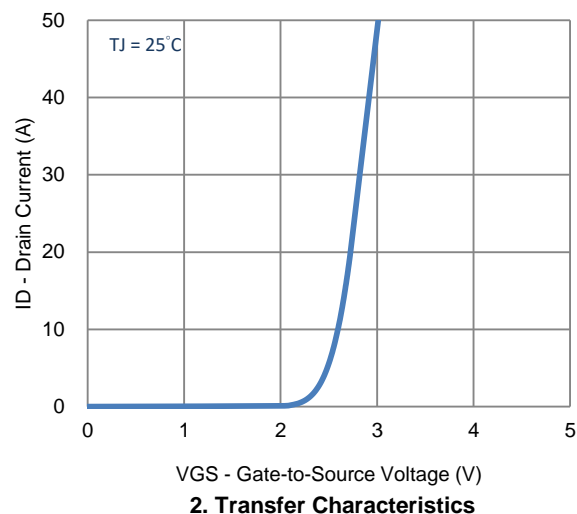
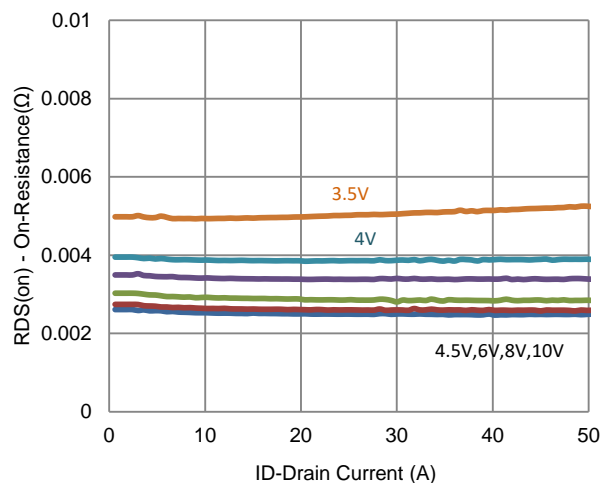
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static</b>						
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = 250 \mu A$	1			V
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0 V$ , $V_{GS} = \pm 20 V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 24 V$ , $V_{GS} = 0 V$			1	$\mu A$
		$V_{DS} = 24 V$ , $V_{GS} = 0 V$ , $T_J = 55^\circ C$			10	
On-State Drain Current <sup>a</sup>	$I_{D(on)}$	$V_{DS} = 5 V$ , $V_{GS} = 10 V$	120			A
Drain-Source On-Resistance <sup>a</sup>	$r_{DS(on)}$	$V_{GS} = 10 V$ , $I_D = 50 A$			3	m $\Omega$
		$V_{GS} = 4.5 V$ , $I_D = 40 A$			4.6	
Forward Transconductance <sup>a</sup>	$g_{fs}$	$V_{DS} = 15 V$ , $I_D = 50 A$		97		S
Diode Forward Voltage <sup>a</sup>	$V_{SD}$	$I_S = 50 A$ , $V_{GS} = 0 V$		1		V
<b>Dynamic <sup>b</sup></b>						
Total Gate Charge	$Q_g$	$V_{DS} = 15 V$ , $V_{GS} = 4.5 V$ , $I_D = 20 A$		23		nC
Gate-Source Charge	$Q_{gs}$			8.0		
Gate-Drain Charge	$Q_{gd}$			8.8		
Turn-On Delay Time	$t_{d(on)}$	$V_{DS} = 15 V$ , $R_L = 0.8 \Omega$ , $I_D = 20 A$ , $V_{GEN} = 10 V$ , $R_{GEN} = 6 \Omega$		8		ns
Rise Time	$t_r$			18		
Turn-Off Delay Time	$t_{d(off)}$			60		
Fall Time	$t_f$			33		
Input Capacitance	$C_{iss}$	$V_{DS} = 15 V$ , $V_{GS} = 0 V$ , $f = 1 Mhz$		1929		pF
Output Capacitance	$C_{oss}$			633		
Reverse Transfer Capacitance	$C_{rss}$			111		

## Notes

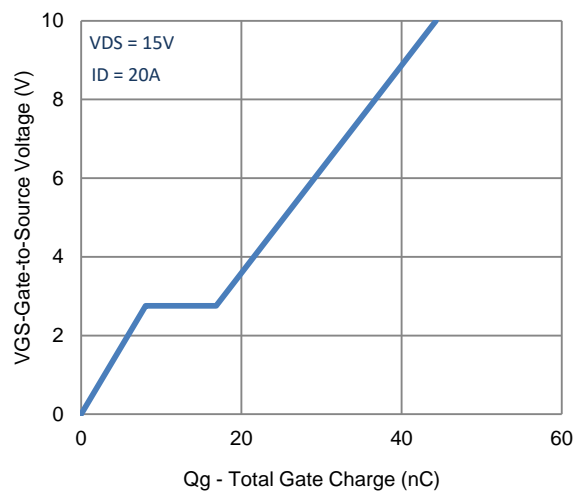
- Pulse test: PW  $\leq$  300us duty cycle  $\leq$  2%.
- Guaranteed by design, not subject to production testing.

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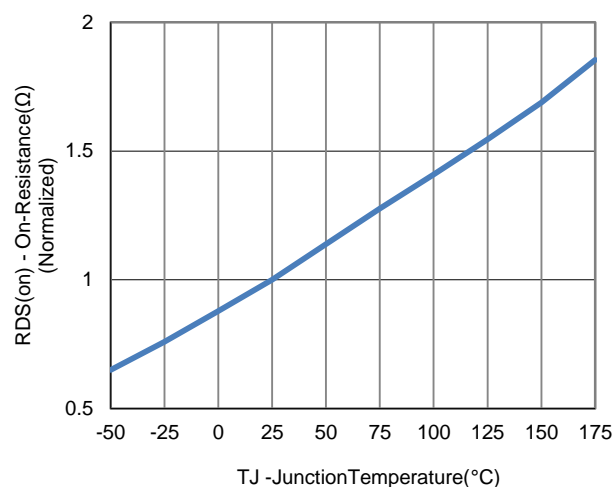
## Typical Electrical Characteristics



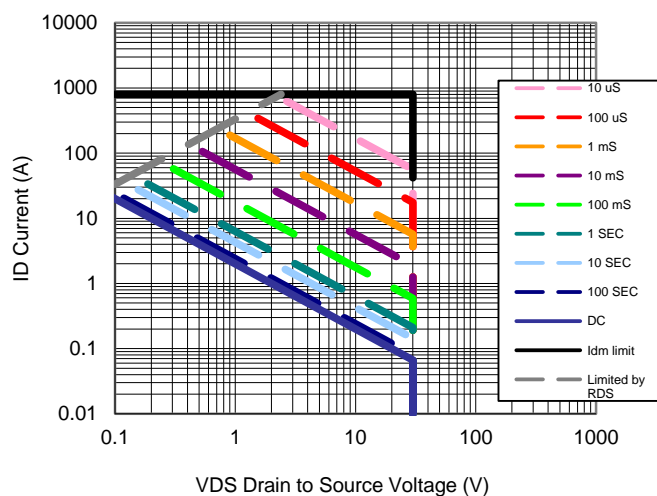
## Typical Electrical Characteristics



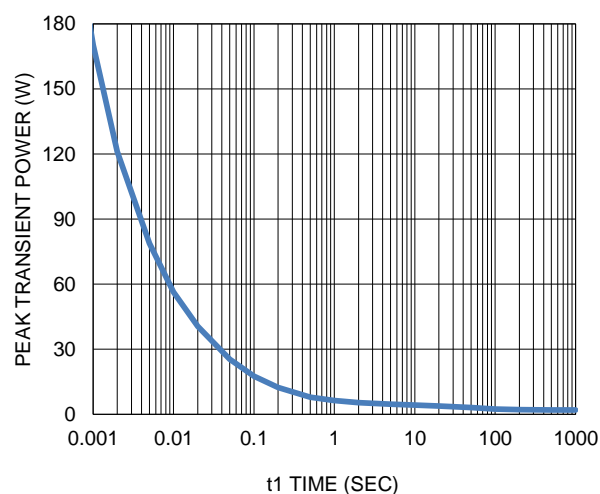
7. Gate Charge



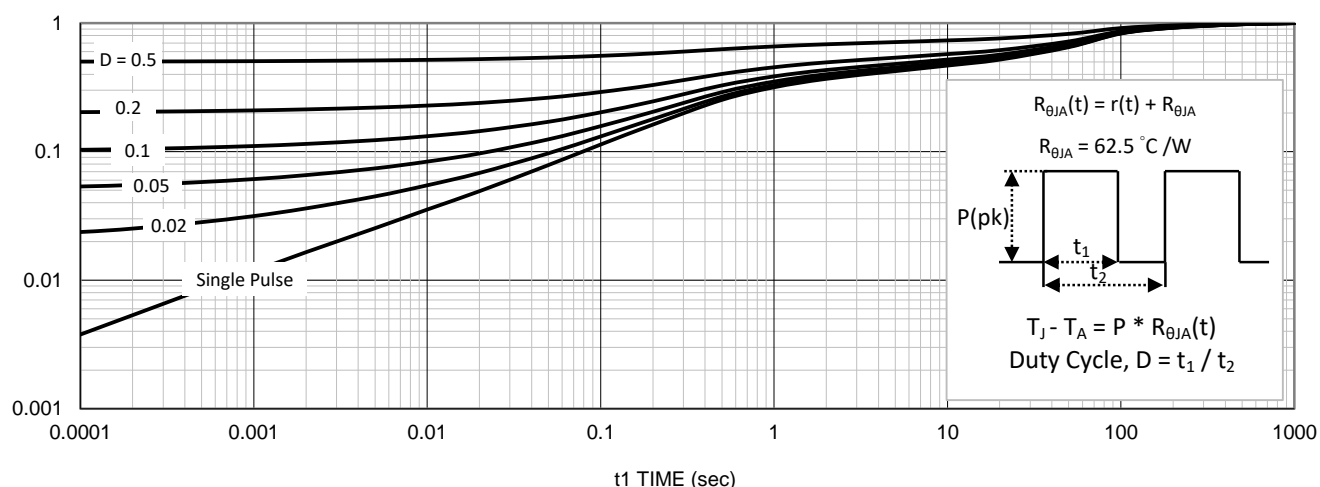
8. Normalized On-Resistance Vs Junction Temperature



9. Safe Operating Area

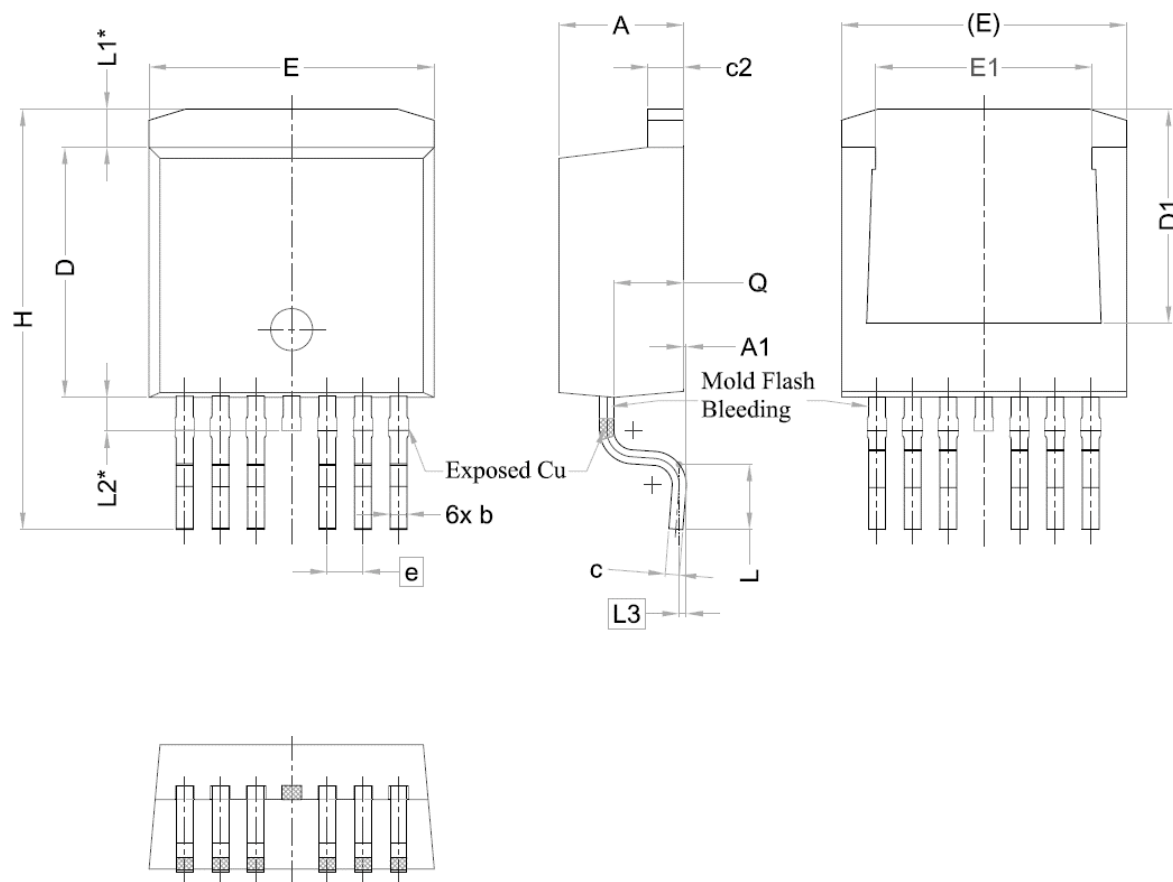


10. Single Pulse Maximum Power Dissipation



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