

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

### Key Features:

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

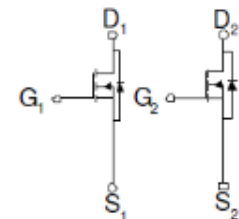
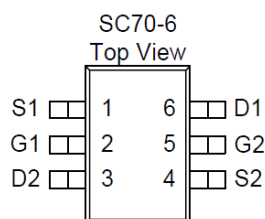
### Typical Applications:

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

PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ (m $\Omega$ )	$I_D$ (A)
30	90 @ $V_{GS} = 10V$	1.5
	130 @ $V_{GS} = 4.5V$	1.3



RoHS  
COMPLIANT  
HALOGEN  
FREE



N-Channel MOSFET



ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ C$ 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>	$T_A = 25^\circ C$	$I_D$	1.5	A
	$T_A = 70^\circ C$		1.1	
Pulsed Drain Current <sup>b</sup>		$I_{DM}$	30	
Continuous Source Current (Diode Conduction) <sup>a</sup>		$I_S$	0.6	A
Power Dissipation <sup>a</sup>	$T_A = 25^\circ C$	$P_D$	0.3	W
	$T_A = 70^\circ C$		0.21	
Operating Junction and Storage Temperature Range		$T_J, T_{stg}$	-55 to 150	$^\circ C$

THERMAL RESISTANCE RATINGS				
Parameter		Symbol	Maximum	Units
Maximum Junction-to-Ambient <sup>a</sup>	$t \leq 10$ sec	$R_{\theta JA}$	415	$^\circ C/W$
	Steady State		460	

Notes

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

## Electrical Characteristics

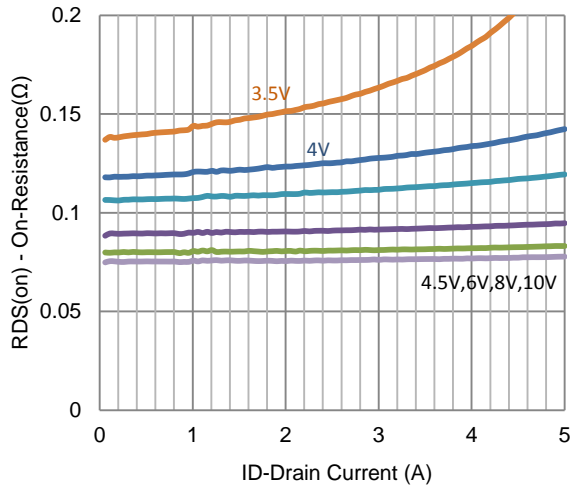
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static</b>						
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250 \mu A$	1			V
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0 V, V_{GS} = \pm 20 V$			$\pm 10$	$\mu A$
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 24 V, V_{GS} = 0 V$			1	$\mu A$
		$V_{DS} = 24 V, V_{GS} = 0 V, T_J = 55^\circ C$			25	
On-State Drain Current	$I_{D(on)}$	$V_{DS} = 5 V, V_{GS} = 10 V$	3			A
Drain-Source On-Resistance	$r_{DS(on)}$	$V_{GS} = 10 V, I_D = 1.5 A$			90	m $\Omega$
		$V_{GS} = 4.5 V, I_D = 1.2 A$			130	
Forward Transconductance	$g_{fs}$	$V_{DS} = 15 V, I_D = 1.5 A$		5		S
Diode Forward Voltage	$V_{SD}$	$I_S = 0.3 A, V_{GS} = 0 V$		0.76		V
<b>Dynamic</b>						
Total Gate Charge	$Q_g$	$V_{DS} = 15 V, V_{GS} = 4.5 V,$ $I_D = 1.5 A$		2		nC
Gate-Source Charge	$Q_{gs}$			0.5		
Gate-Drain Charge	$Q_{gd}$			1.1		
Turn-On Delay Time	$t_{d(on)}$	$V_{DS} = 15 V, R_L = 10 \Omega,$ $I_D = 1.5 A,$ $V_{GEN} = 10 V, R_{GEN} = 6 \Omega$		2		ns
Rise Time	$t_r$			5		
Turn-Off Delay Time	$t_{d(off)}$			12		
Fall Time	$t_f$			3		
Input Capacitance	$C_{iss}$	$V_{DS} = 15 V, V_{GS} = 0 V, f = 1 MHz$		103		pF
Output Capacitance	$C_{oss}$			20		
Reverse Transfer Capacitance	$C_{rss}$			17		

## Notes

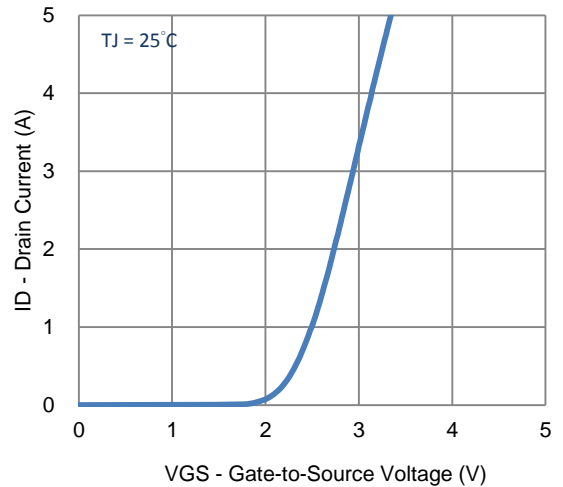
- Pulse test:  $PW \leq 300 \mu s$  duty cycle  $\leq 2\%$ .
- Guaranteed by design, not subject to production testing.

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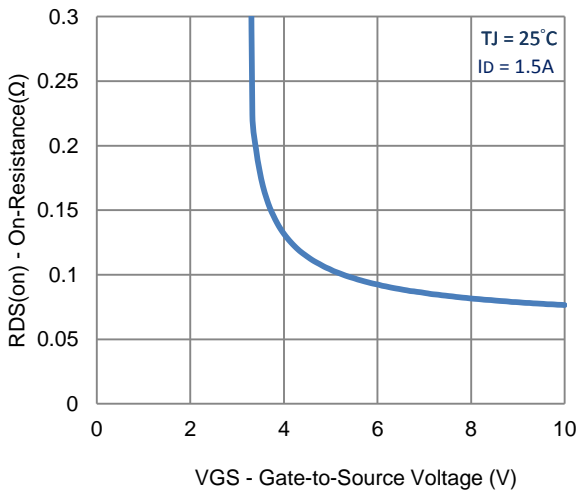
Typical Electrical Characteristics



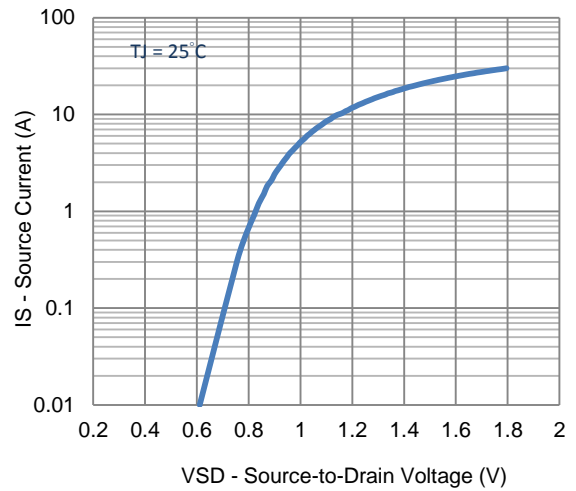
1. On-Resistance vs. Drain Current



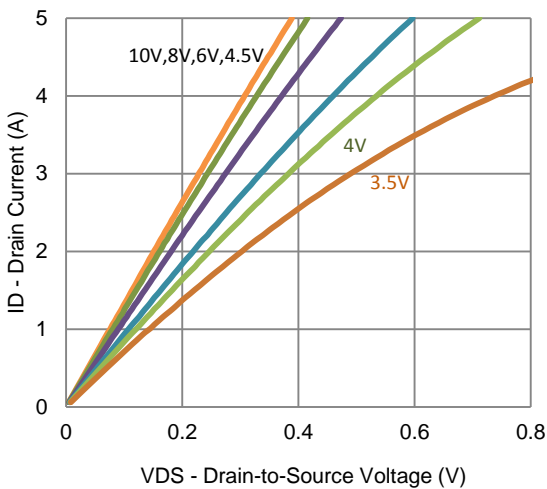
2. Transfer Characteristics



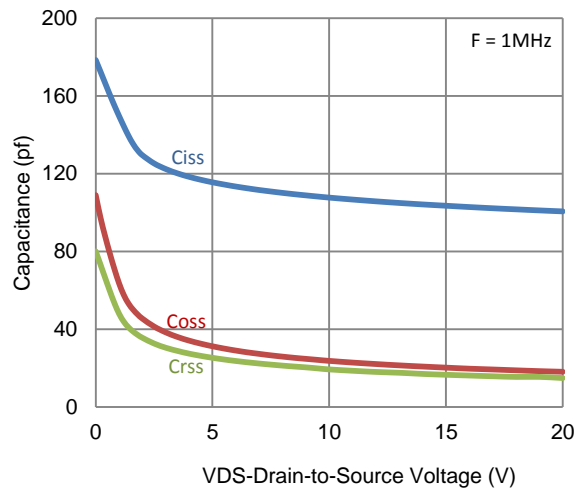
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage

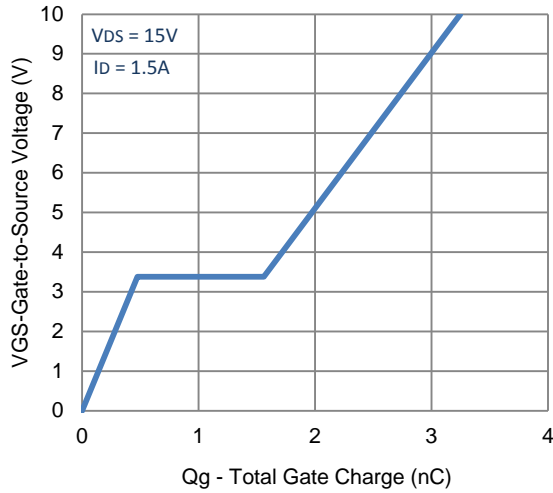


5. Output Characteristics

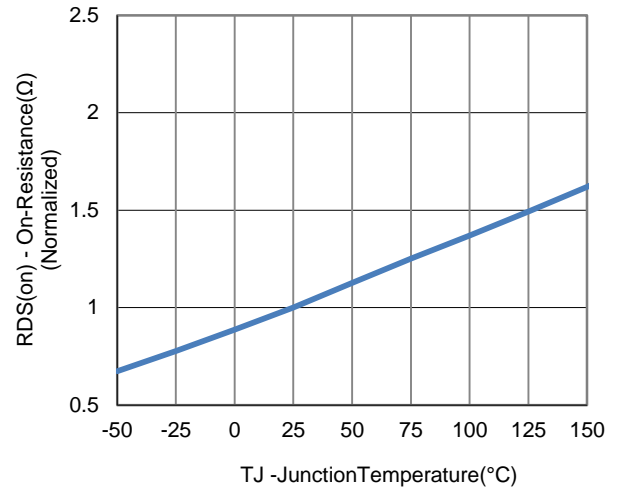


6. Capacitance

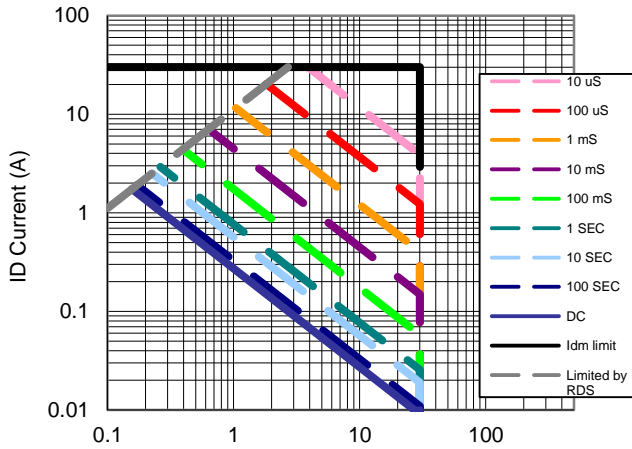
Typical Electrical Characteristics



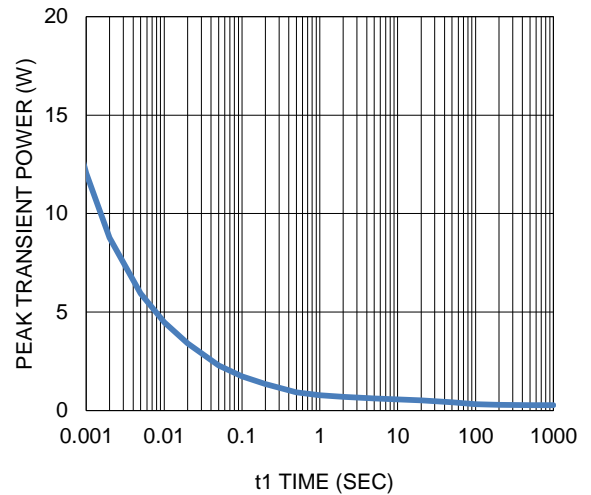
7. Gate Charge



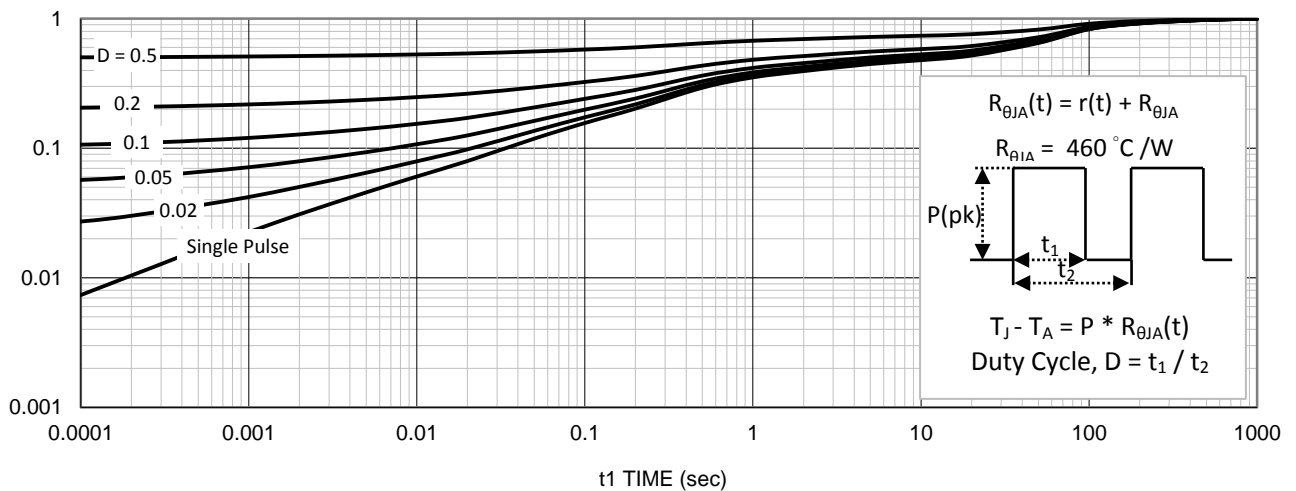
8. Normalized On-Resistance Vs Junction Temperature



9. Safe Operating Area



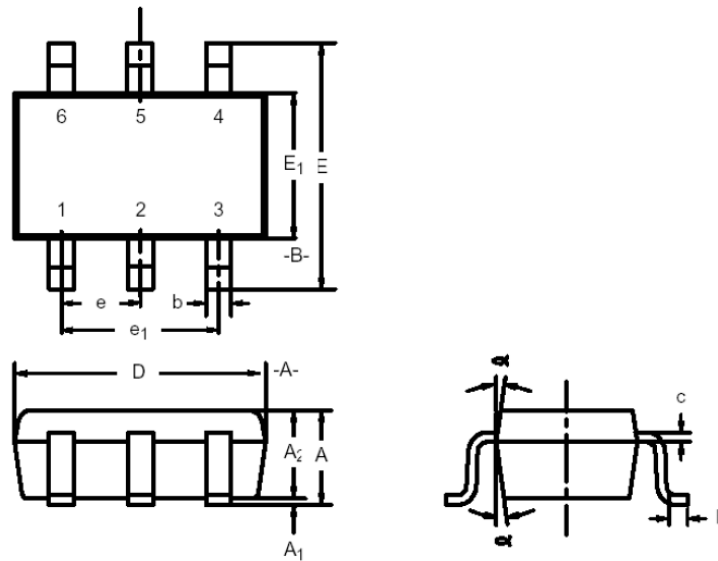
10. Single Pulse Maximum Power Dissipation



11. Normalized Thermal Transient Junction to Ambient

## Package Information

## SC-70: 6LEAD



Dim	MILLIMETERS			INCHES		
	Min	Nom	Max	Min	Nom	Max
<b>A</b>	0.90	–	1.10	0.035	–	0.043
<b>A<sub>1</sub></b>	–	–	0.10	–	–	0.004
<b>A<sub>2</sub></b>	0.80	–	1.00	0.031	–	0.039
<b>b</b>	0.15	–	0.30	0.006	–	0.012
<b>c</b>	0.10	–	0.25	0.004	–	0.010
<b>D</b>	1.80	2.00	2.20	0.071	0.079	0.087
<b>E</b>	1.80	2.10	2.40	0.071	0.083	0.094
<b>E<sub>1</sub></b>	1.15	1.25	1.35	0.045	0.049	0.053
<b>e</b>	0.65BSC			0.026BSC		
<b>e<sub>1</sub></b>	1.20	1.30	1.40	0.047	0.051	0.055
<b>L</b>	0.10	0.20	0.30	0.004	0.008	0.012
<b>α</b>	7°Nom			7°Nom		