

## Features

- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)
- HBM ESD protection level pass 8KV

**Note :** The diode connected between the gate and source serves only as protection against ESD. No gate overvoltage rating is implied.

## Applications

- Power Management in LCD TV Inverter.

## Product Summary

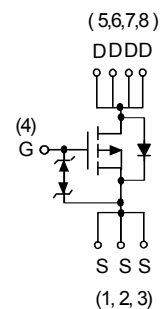
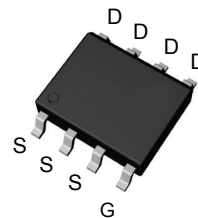
-40V/-16.7A,

$R_{DS(ON)} = 8.5m\Omega$  (max.) @  $V_{GS} = -20V$

$R_{DS(ON)} = 10m\Omega$  (max.) @  $V_{GS} = -10V$

$R_{DS(ON)} = 16m\Omega$  (max.) @  $V_{GS} = -4.5V$

## SOP-8 Pin Configuration



## Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit	
$V_{DSS}$	Drain-Source Voltage	-40	V	
$V_{GSS}$	Gate-Source Voltage	$\pm 25$		
$I_D^a$	Continuous Drain Current ( $V_{GS} = -10V$ )	$T_A = 25^\circ C$	-16.7	A
		$T_A = 70^\circ C$	-13.3	
$I_{DM}^a$	Pulsed Drain Current ( $V_{GS} = -10V$ )	-66		
$I_S^a$	Diode Continuous Forward Current	-4		
$I_{AS}^b$	Avalanche Current, Single pulse	L=0.1mH	-43	mJ
		L=0.5mH	-24	
$E_{AS}^b$	Avalanche Energy, Single pulse	L=0.1mH	92	
		L=0.5mH	144	
$T_J$	Maximum Junction Temperature	150	$^\circ C$	
$T_{STG}$	Storage Temperature Range	-55 to 150		
$P_D^a$	Maximum Power Dissipation	$T_A = 25^\circ C$	4.2	W
		$T_A = 70^\circ C$	2.7	
$R_{\theta JA}^a$	Thermal Resistance-Junction to Ambient	$t \leq 10s$	30	$^\circ C/W$
		Steady State	75	
$R_{\theta JL}^c$	Thermal Resistance-Junction to Lead	Steady State	24	

Note a : Surface Mounted on  $1in^2$  pad area,  $t \leq 10sec$ .

Note b : UIS tested and pulse width limited by maximum junction temperature  $150^\circ C$  (initial temperature  $T_J = 25^\circ C$ ).

Note c : The power dissipation  $P_D$  is based on  $T_{J(MAX)} = 150^\circ C$ , and it is useful for reducing junction-to-case thermal resistance ( $R_{\theta JC}$ ) when additional heat sink is used.

**Electrical Characteristics** ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

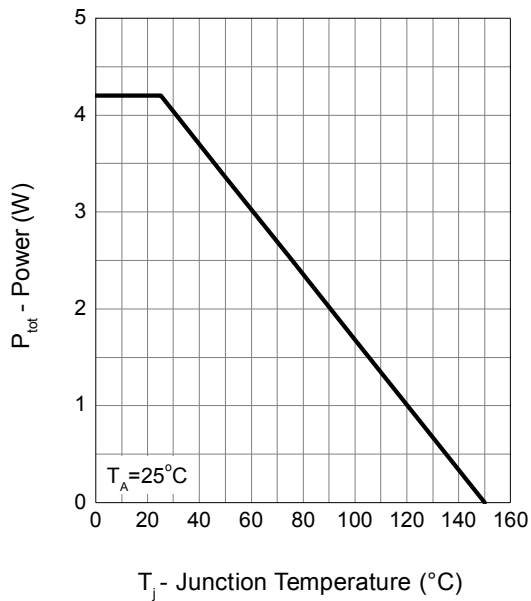
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=-250\mu A$	-40	-	-	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=-32V, V_{GS}=0V$	-	-	-1	$\mu A$
		$T_J=85^\circ C$	-	-	-30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=-250\mu A$	-1.5	-2	-2.5	V
$I_{GSS}$	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 10$	$\mu A$
$R_{DS(ON)}^d$	Drain-Source On-state Resistance	$V_{GS}=-20V, I_{DS}=-16A$	-	7	8.5	m $\Omega$
		$V_{GS}=-10V, I_{DS}=-16A$	-	7.9	10	
		$V_{GS}=-4.5V, I_{DS}=-10A$	-	11.5	16	
<b>Diode Characteristics</b>						
$V_{SD}^d$	Diode Forward Voltage	$I_{SD}=-1A, V_{GS}=0V$	-	-0.75	-1	V
$t_{rr}$	Reverse Recovery Time	$I_{SD}=-16A, di_{SD}/dt=100A/\mu s$	-	26	-	ns
$Q_{rr}$	Reverse Recovery Charge		-	19	-	nC
<b>Dynamic Characteristics<sup>e</sup></b>						
$R_G$	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1MHz$	-	3.2	-	$\Omega$
$C_{ISS}$	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=-20V,$ Frequency=1.0MHz	-	2764	-	pF
$C_{OSS}$	Output Capacitance		-	417	-	
$C_{RSS}$	Reverse Transfer Capacitance		-	325	-	
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=-20V, R_L=20\Omega,$ $I_{DS}=-1A, V_{GEN}=-10V,$ $R_G=6\Omega$	-	15	-	ns
$t_r$	Turn-on Rise Time		-	12	-	
$t_{d(OFF)}$	Turn-off Delay Time		-	56	-	
$t_f$	Turn-off Fall Time		-	21	-	
<b>Gate Charge Characteristics<sup>e</sup></b>						
$Q_g$	Total Gate Charge	$V_{DS}=-20V, V_{GS}=-10V,$ $I_{DS}=-16A$	-	60	-	nC
$Q_{gs}$	Gate-Source Charge		-	7.6	-	
$Q_{gd}$	Gate-Drain Charge		-	15	-	

Note d : Pulse test; pulse width $\leq 300\mu s$ , duty cycle $\leq 2\%$ .

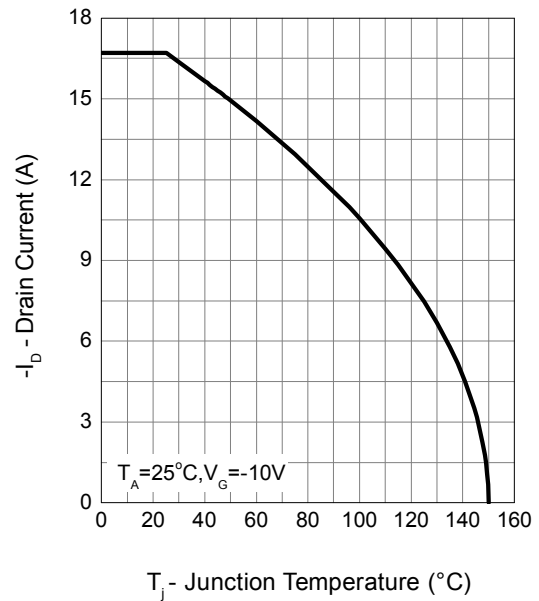
Note e : Guaranteed by design, not subject to production testing.

**Typical Characteristics**

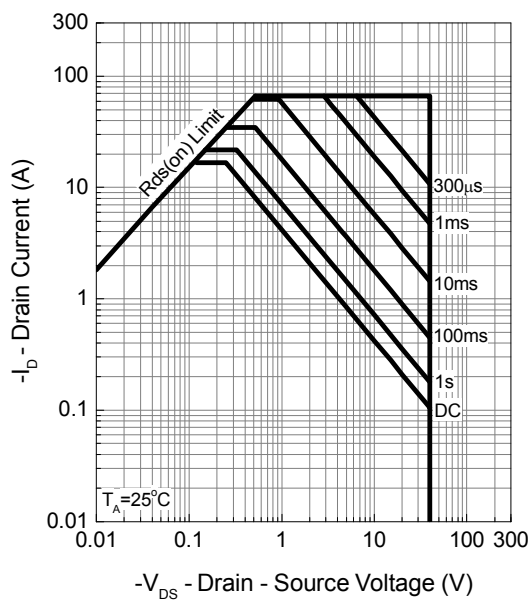
**Power Dissipation**



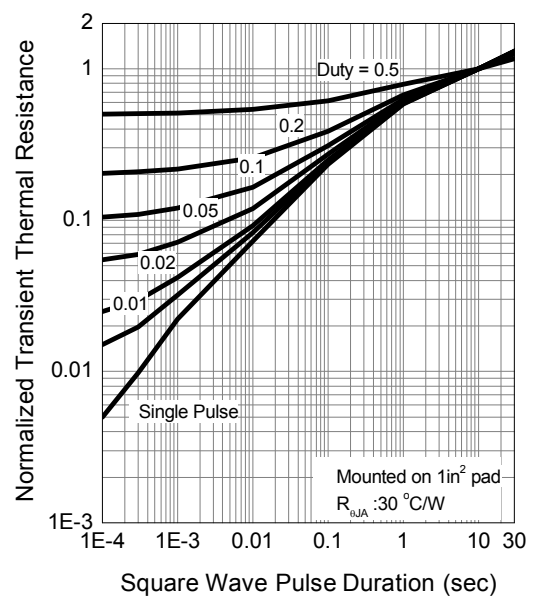
**Drain Current**



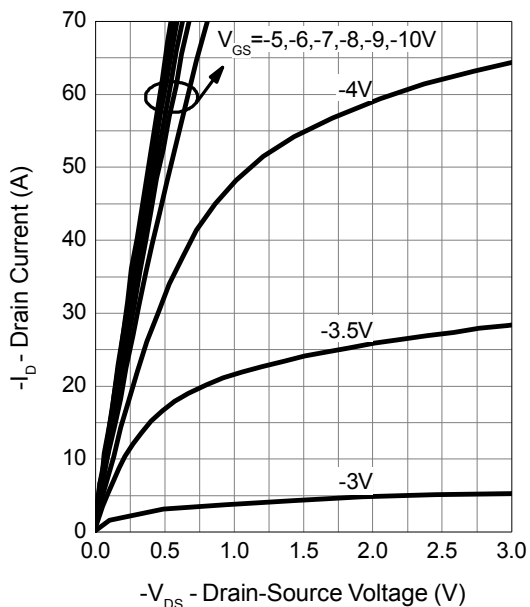
**Safe Operation Area**



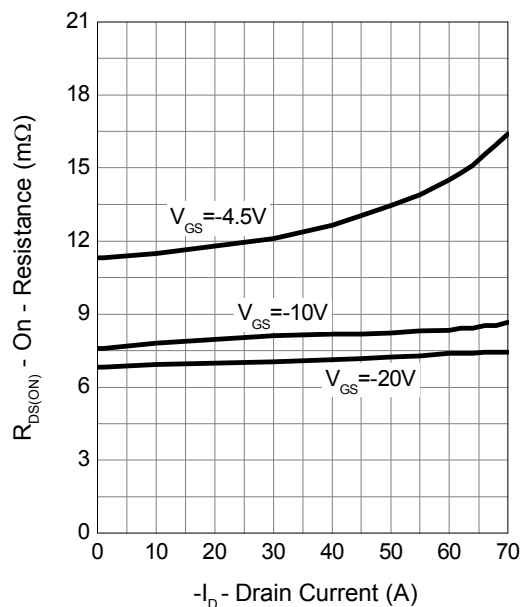
**Thermal Transient Impedance**



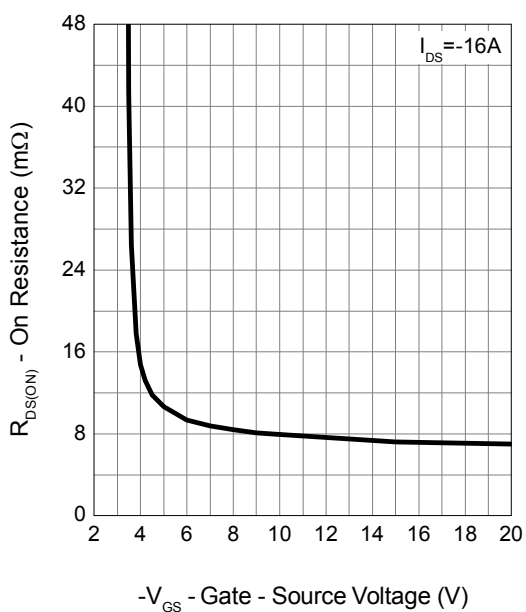
**Output Characteristics**



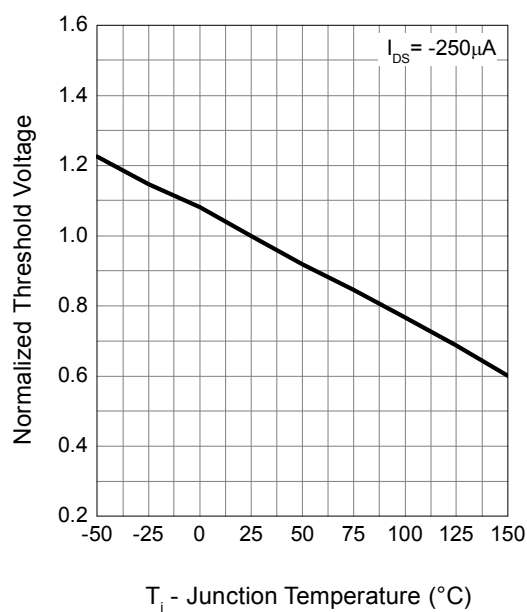
**Drain-Source On Resistance**



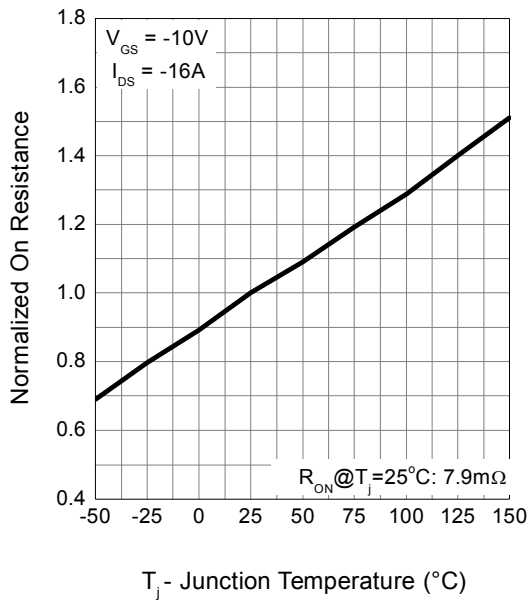
**Gate-Source On Resistance**



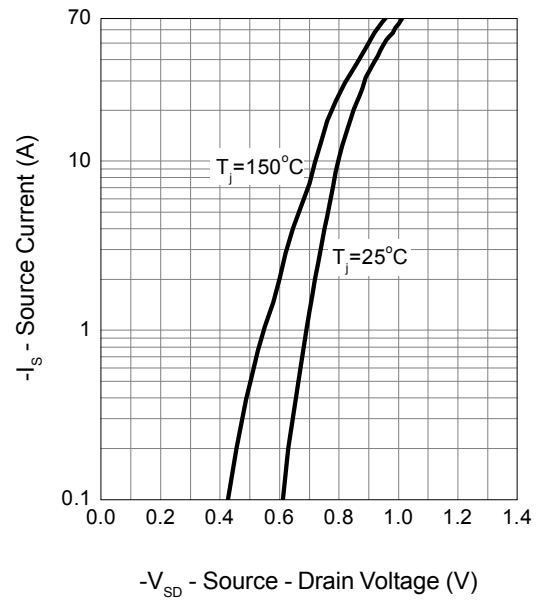
**Gate Threshold Voltage**



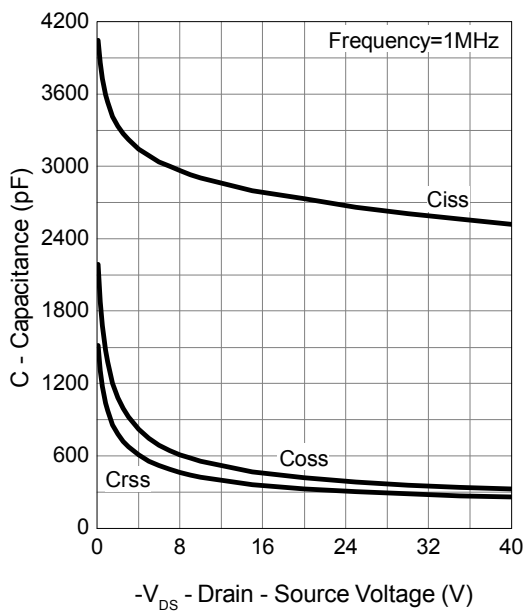
**Drain-Source On Resistance**



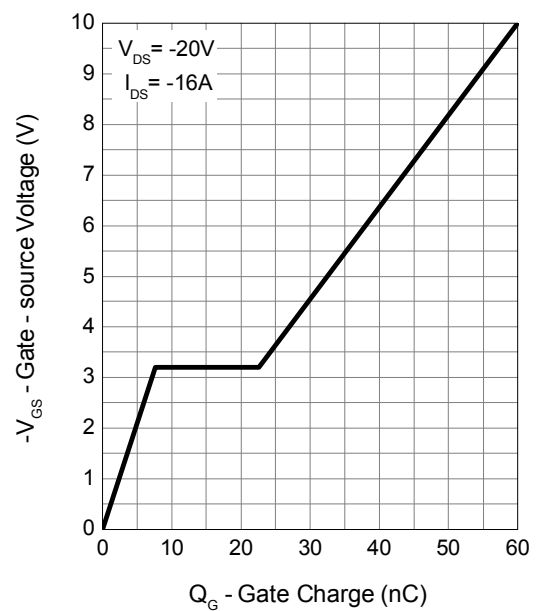
**Source-Drain Diode Forward**



**Capacitance**



**Gate Charge**





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