

Features

- Low drain-source on-resistance: $R_{DS(ON)}=0.68\Omega$ (typ)
- Easy to control gate switching
- Enhancement mode: $V_{th} = 2.5$ to $4.5V$
- 100% avalanche tested
- RoHS compliant

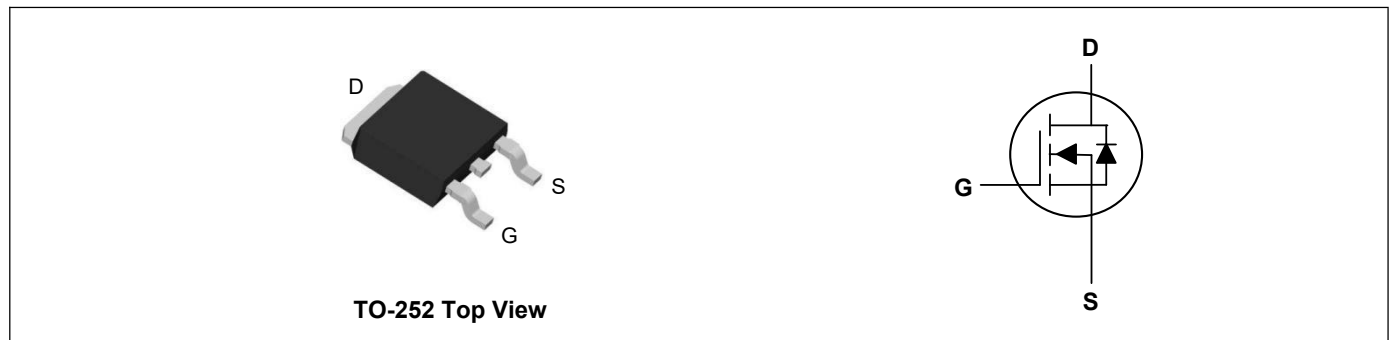
Key Performance Parameters



Parameter	Value	Unit
$V_{DS} @ T_{j,max}$	500	V
$R_{DS(ON),max}$	0.75	Ω
I_D	8	A
$Q_{g,typ}$	7.3	nC
I_{DM}	16	A

Applications

- Switch Mode Power Supply (SMPS)
- Uninterruptible Power Supply (UPS)
- Power Factor Correction (PFC)
- Charger, Lighting.



Absolute Maximum Ratings ($T_C=25^\circ C$, unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	500	V
Gate-Source Voltage	V_{GS}	± 30	V
Continuous Drain Current ¹	$I_D @ T_C=25^\circ C$	8	A
Pulsed Drain Current ²	I_{DM}	16	A
Single Pulse Avalanche Energy	EAS	20	mJ
MOSFET dv/dt ruggedness, $V_{DS} = 0 \dots 400V$	dv/dt	50	V/ns
Reverse diode dv/dt ³ $V_{DS}=0 \dots 400V, I_{SD} \leq 48A, T_j=25^\circ C$		15	
Total Power Dissipation ($T_C=25^\circ C$)	P_D	45	W
Storage Temperature Range	T_{STG}	-55 to 150	$^\circ C$
Operating Junction Temperature Range	T_J	-55 to 150	$^\circ C$

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-Ambient	$R_{\theta JA}$	62	$^\circ C/W$
Thermal Resistance Junction-Case	$R_{\theta JC}$	2.8	$^\circ C/W$

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=0.25mA$	500	---	---	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=1A$	---	0.68	0.75	Ω
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=0.25mA$	2.5	3.3	4.5	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=500V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	1	nA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 30V, V_{DS}=0V$	---	---	± 100	nA
Gate Resistance	R_G	$f = 1.0MHz, \text{open drain}$	---	5.3	---	Ω
Total Gate Charge	Q_g	$V_{DD}=480V, V_{GS}=10V, I_D=2A$	---	7.3	---	nC
Gate-Source Charge	Q_{gs}		---	1.4	---	
Gate-Drain Charge	Q_{gd}		---	3.1	---	
Gate Plateau Voltage	$V_{plateau}$		---	5.2	---	V
Turn-On Delay Time	$T_{d(on)}$	$V_{DD}=300V, V_{GS}=10V, R_G=25\Omega, I_D=2A$	---	8	---	ns
Rise Time	T_r		---	8	---	
Turn-Off Delay Time	$T_{d(off)}$		---	48	---	
Fall Time	T_f		---	10	---	
Input Capacitance	C_{iss}	$V_{DS}=100V, V_{GS}=0V, f=1MHz$	---	340	---	pF
Output Capacitance	C_{oss}		---	14	---	
Reverse Transfer Capacitance	C_{rss}		---	1.2	---	

Drain-Source Diode Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Diode Forward Voltage	V_{SD}	$V_G=0V, I_F=1A, T_J=25^\circ\text{C}$	---	---	1.2	V
Reverse Recovery Time	t_{rr}	$V_R=50V, I_F=2A, di_F/dt=100A/\mu s$	---	92	---	ns
Reverse Recovery Charge	Q_{rr}		---	0.5	---	μC
Peak Reverse Recovery Current	I_{rrm}		---	9.6	---	A

Note:

- Limited by $T_{j,max}$. Maximum Duty Cycle $D = 0.50$
- Pulse width t_p limited by $T_{j,max}$
- Identical low side and high side switch with identical R_G

Typical Characteristics

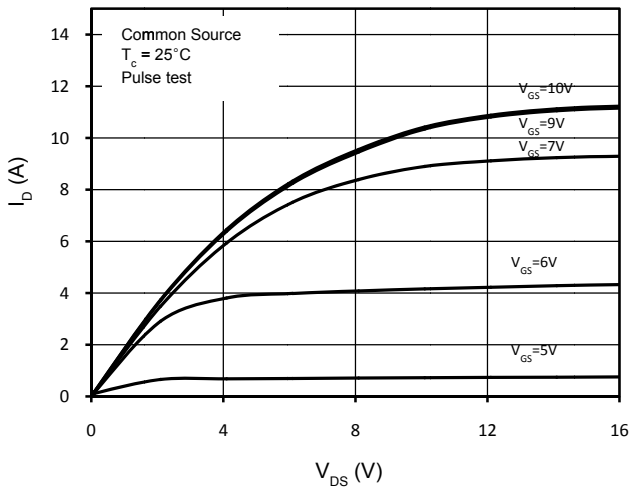


Figure 1. On-Region Characteristics

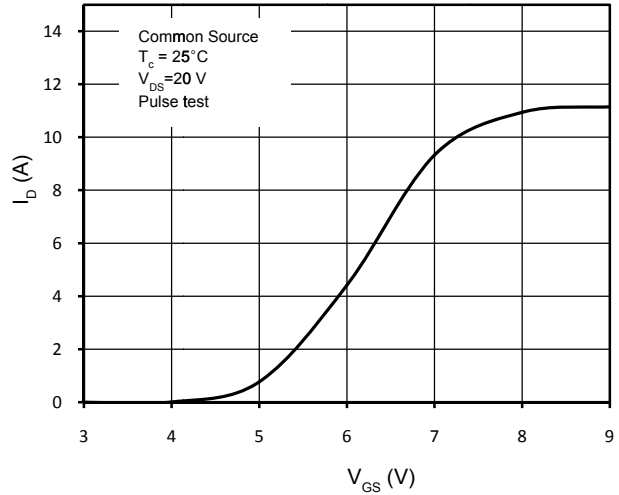


Figure 2. Transfer Characteristics

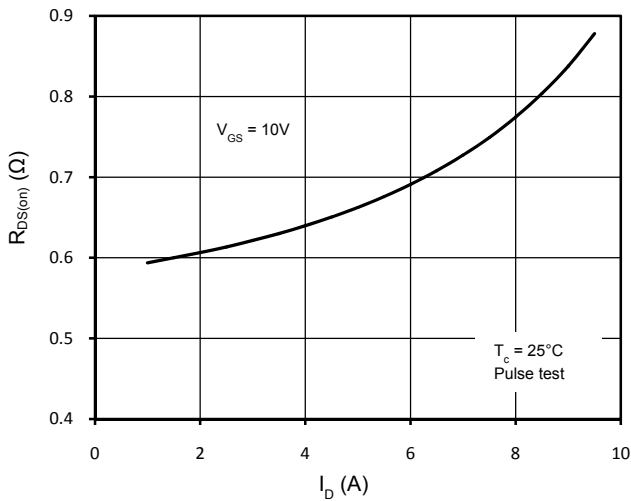


Figure 3. Static Drain-Source On Resistance

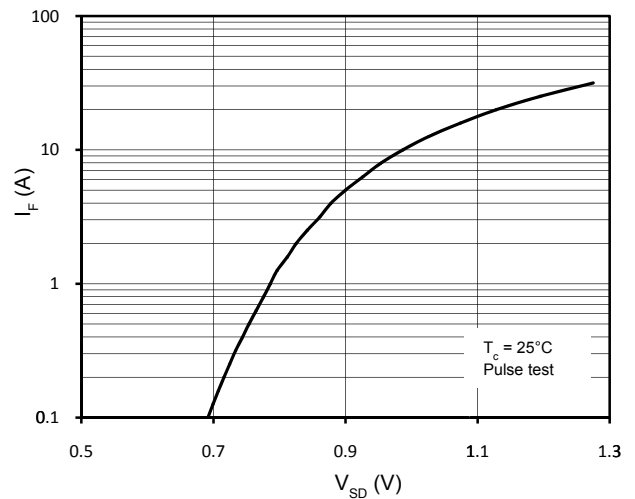


Figure 4. Body-Diode Forward Characteristics

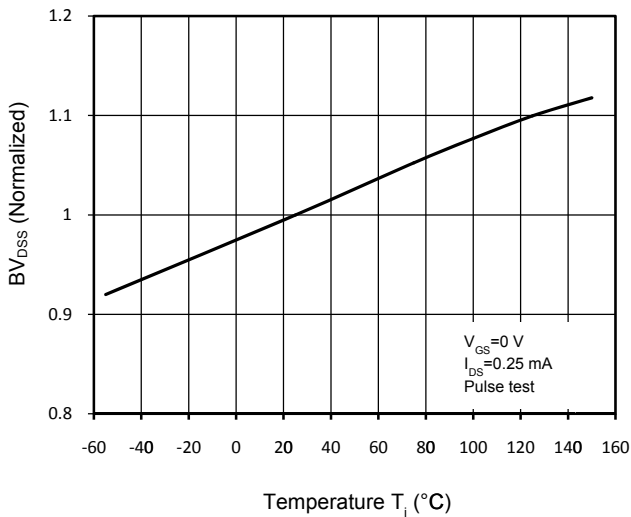


Figure 5. Normalized BV_{DS} vs. Temperature

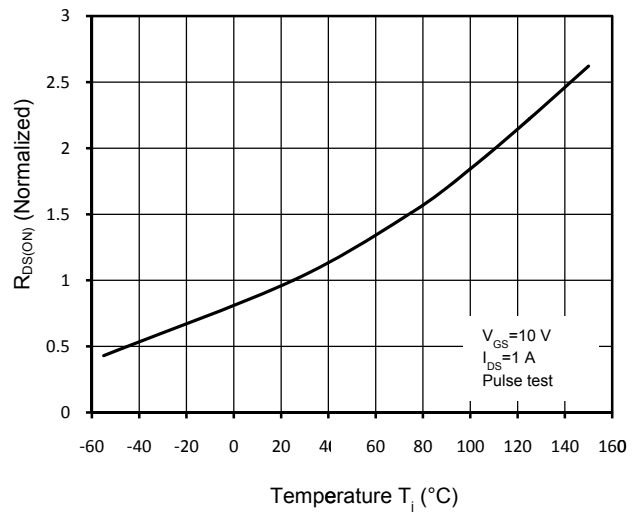


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

500V Super Junction Power MOSFET

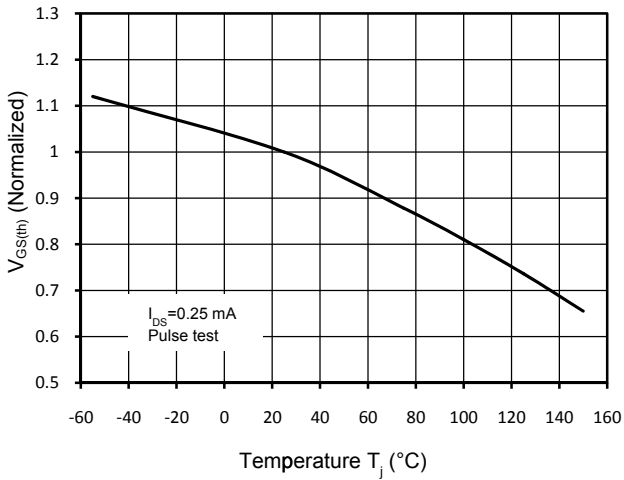


Figure 7. Threshold Voltage vs. Temperature

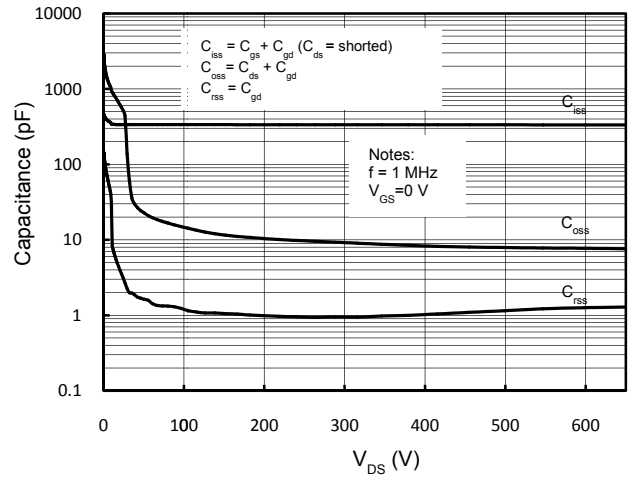


Figure 8. Capacitance Characteristics

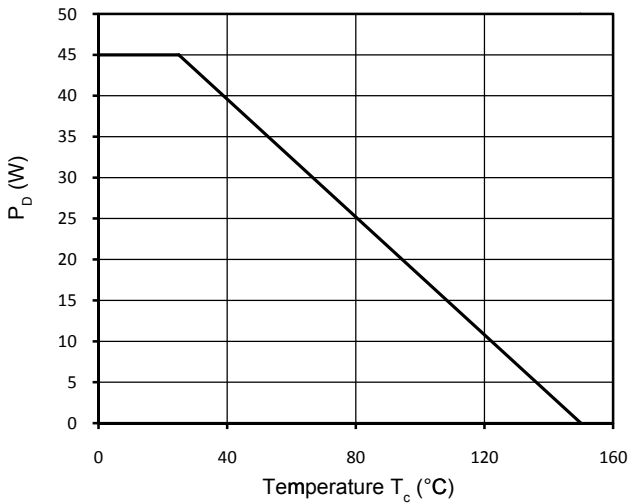


Figure 9. Power Dissipation

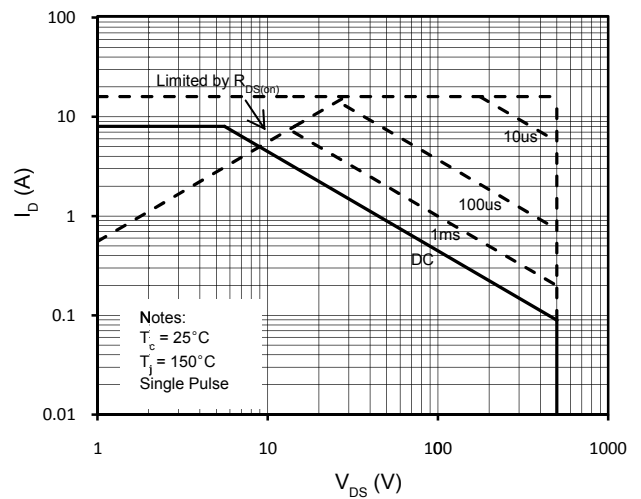


Figure 10. Maximum Safe Operating Area

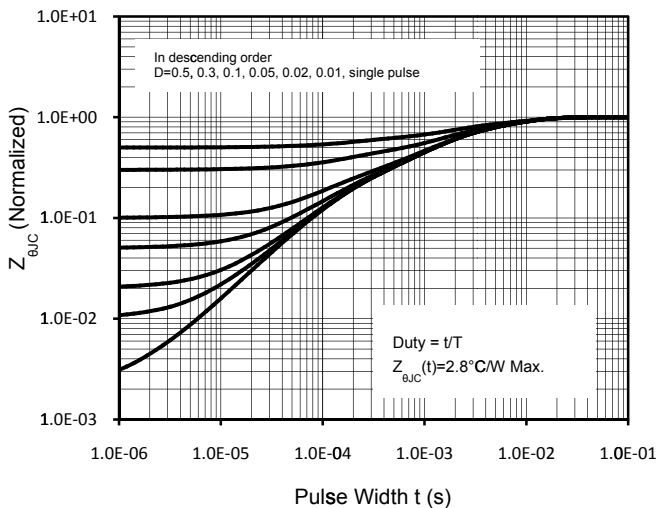


Figure 11. Transient Thermal Response Curve

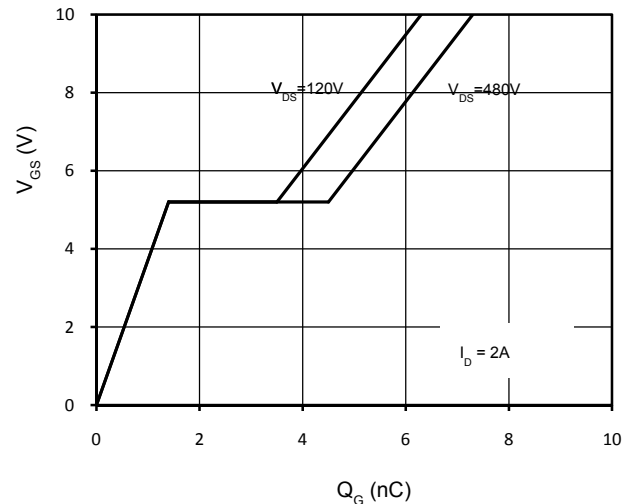
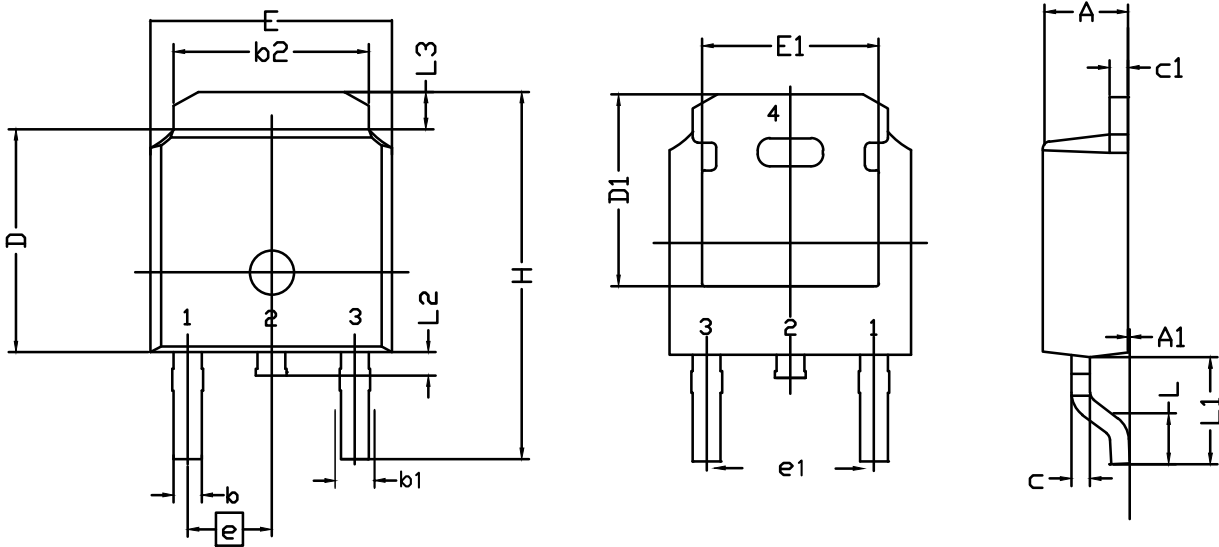


Figure 12. Gate Charge Characteristics

TO-252 Package Outline Dimensions



Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
A	2.20	2.30	2.38	E	6.40	6.60	6.731
A ₁	0.00	0.10	0.20	E ₁	4.40	--	--
b	0.64	0.76	0.89	e	2.286 BSC		
b ₁	0.77	0.85	1.14	e ₁	4.572 BSC		
b ₂	5.00	5.33	5.46	H	9.40	10.00	10.40
c	0.458	0.508	0.610	L	1.40	1.52	1.77
C ₁	0.458	0.508	0.620	L ₁	--	2.743	--
D	5.98	6.10	6.223	L ₂	0.60	0.80	1.01
D ₁	5.20	5.25	5.38	L ₃	0.90	1.06	1.25