

## Features

- Low drain-source on-resistance:  $R_{DS(ON)}=26\text{m}\Omega(\text{typ})$
- Fast Recovery Body-Diode
- Fast switching
- 100% avalanche tested
- RoHS compliant

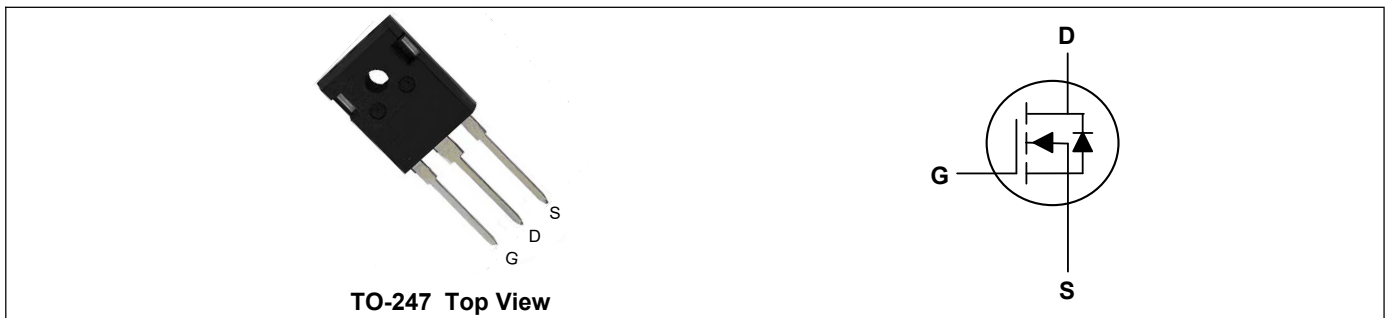
## Key Performance Parameters



Parameter	Value	Unit
$V_{DS} @ T_{j,max}$	600	V
$R_{DS(ON),max}$	30	m $\Omega$
$I_D$	75	A
$Q_{g,typ}$	209	nC
$I_{DM}$	261	A

## Applications

- Switch Mode Power Supply (SMPS)
- Uninterruptible Power Supply (UPS)
- Power Factor Correction (PFC)



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	600	V
Gate-Source Voltage	$V_{GS}$	$\pm 30$	V
Continuous Drain Current <sup>1</sup>	$I_D$	75	A
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	261	A
Single Pulse Avalanche Energy <sup>4</sup>	EAS	1083	mJ
Avalanche Current	$I_{AS}$	13	A
Repetitive Avalanche Energy	$E_{AR}$	5.68	mJ
MOSFET dv/dt ruggedness, $V_{DS} = 0 \dots 400\text{V}$	dv/dt	100	V/ns
Reverse diode dv/dt <sup>3</sup> $V_{DS}=0 \dots 400\text{V}$ , $I_{SD} \leq I_D$		50	
Total Power Dissipation ( $T_C=25^\circ\text{C}$ )	$P_D$	568	W
Storage Temperature Range	$T_{STG}$	-55 to 150	$^\circ\text{C}$
Operating Junction Temperature Range	$T_J$	-55 to 150	$^\circ\text{C}$

## Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-Ambient (Max)	$R_{\theta JA}$	40	$^\circ\text{C}/\text{W}$
Thermal Resistance Junction-Case (Max)	$R_{\theta JC}$	0.22	$^\circ\text{C}/\text{W}$

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	600	---	---	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=37.5A$	---	26	30	m $\Omega$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=5mA$	3.0	---	5.0	V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=600V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	10	$\mu A$
		$V_{DS}=480V, V_{GS}=0V, T_J=125^\circ\text{C}$	---	170	---	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 30V, V_{DS}=0V$	---	---	$\pm 100$	nA
Gate Resistance	$R_G$	$f = 1.0\text{MHz}$ , open drain	---	1	---	$\Omega$
Total Gate Charge	$Q_g$	$V_{DS}=400V, V_{GS}=10V, I_D=37.5A$	---	209	---	nC
Gate-Source Charge	$Q_{gs}$		---	49	---	
Gate-Drain Charge	$Q_{gd}$		---	104	---	
Turn-On Delay Time	$T_{d(on)}$	$V_{DS}=400V, V_{GS}=10V, R_G=2.7\Omega, I_D=37.5A$	---	37	---	ns
Rise Time	$T_r$		---	14	---	
Turn-Off Delay Time	$T_{d(off)}$		---	127	---	
Fall Time	$T_f$		---	11	---	
Input Capacitance	$C_{iss}$	$V_{DS}=400V, V_{GS}=0V, f=250\text{MHz}$	---	8520	---	pF
Output Capacitance	$C_{oss}$		---	192	---	
Reverse Transfer Capacitance	$C_{rss}$		---	---	---	

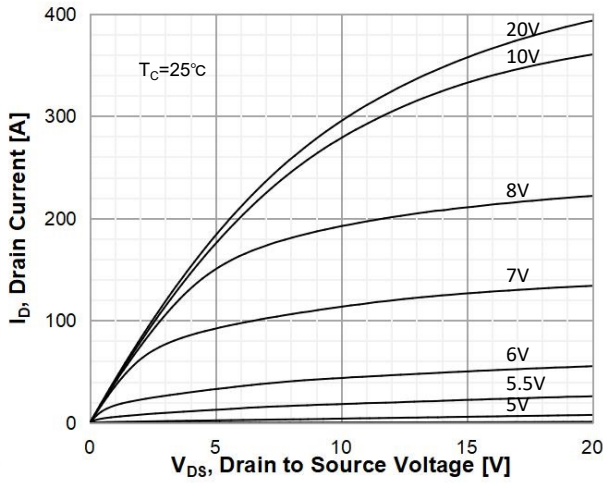
**Drain-Source Diode Characteristics**

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Continuous Source Current	$I_S$	$T_C=25^\circ\text{C}$	---	---	75	A
Pulsed Source Current	$I_{SM}$		---	---	261	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=37.5A, T_J=25^\circ\text{C}$	---	0.7	1.2	V
Reverse Recovery Time	$t_{rr}$	$V_{DD}=400V, I_S=37.5A, di_f/dt=100A/\mu s$	---	234	---	ns
Reverse Recovery Charge	$Q_{rr}$		---	2.3	---	$\mu C$

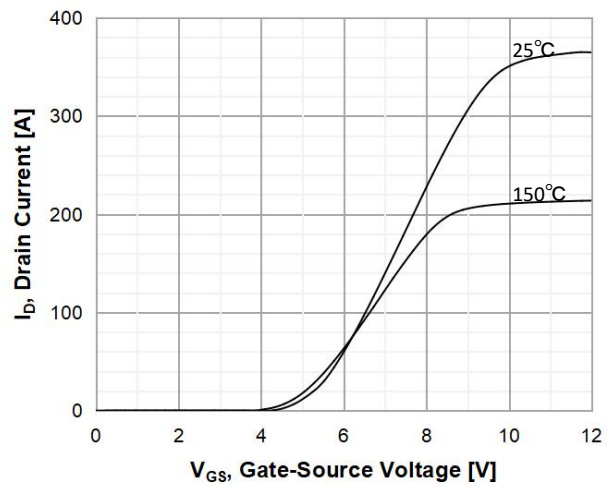
**Note:**

- 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  $R_G$
- $R_G=25\Omega, I_{AS}=10.1A$ , Starting  $T_J=25^\circ\text{C}$

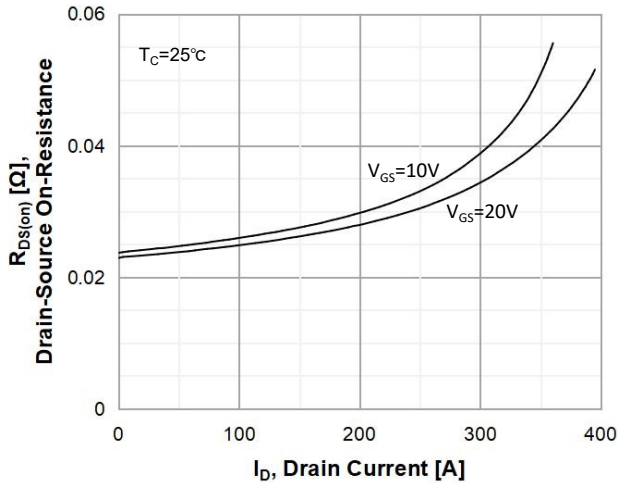
**Typical Characteristics**



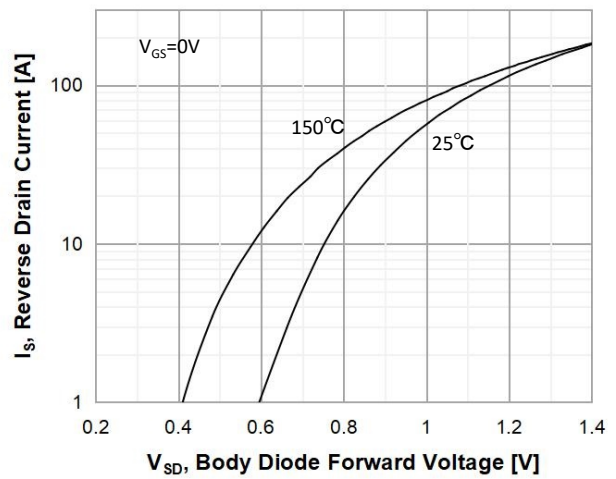
**Figure 1. On-Region Characteristics**



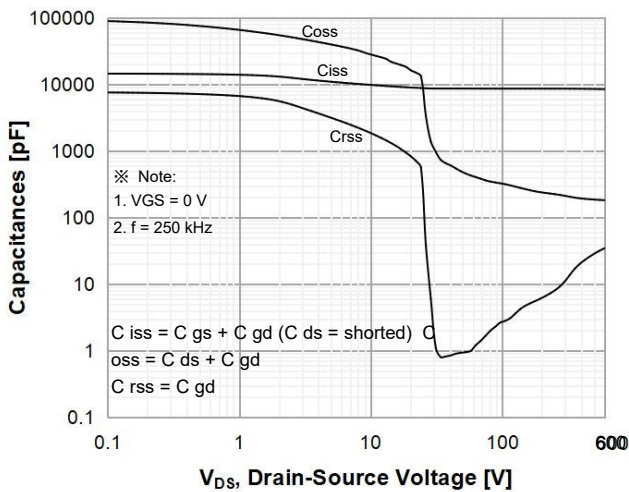
**Figure 2. Transfer Characteristics**



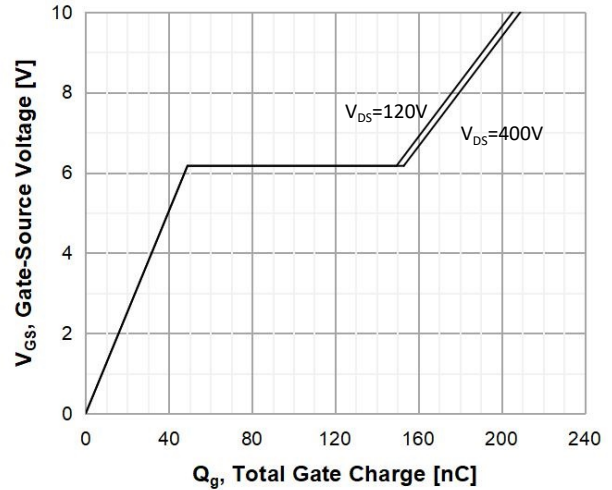
**Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage**



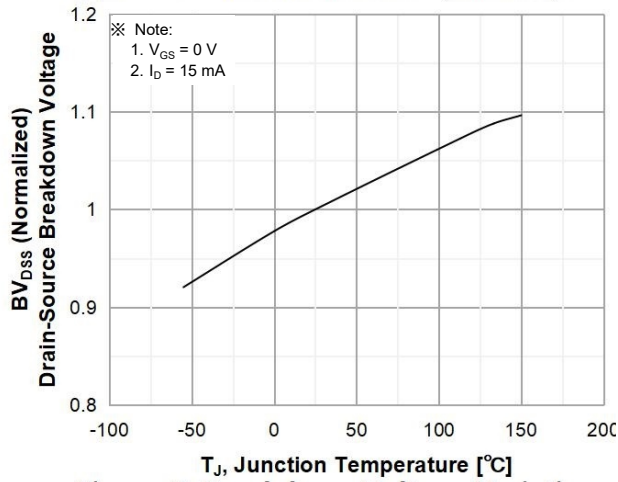
**Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature**



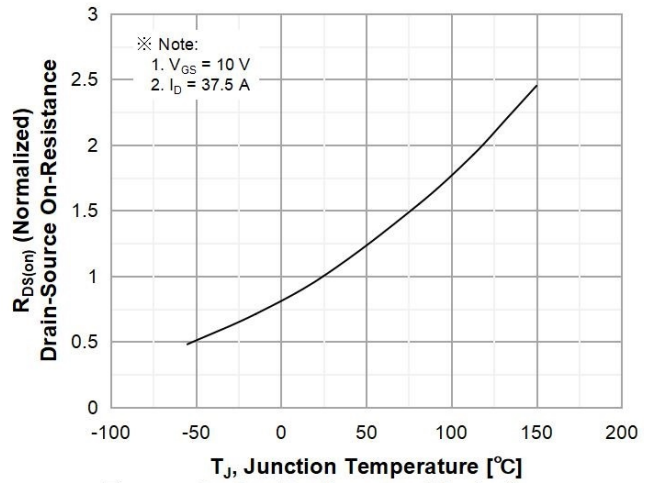
**Figure 5. Capacitance Characteristics**



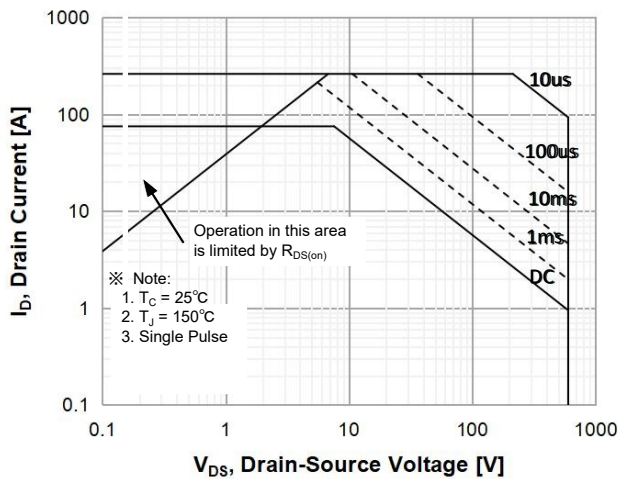
**Figure 6. Gate Charge Characteristics**



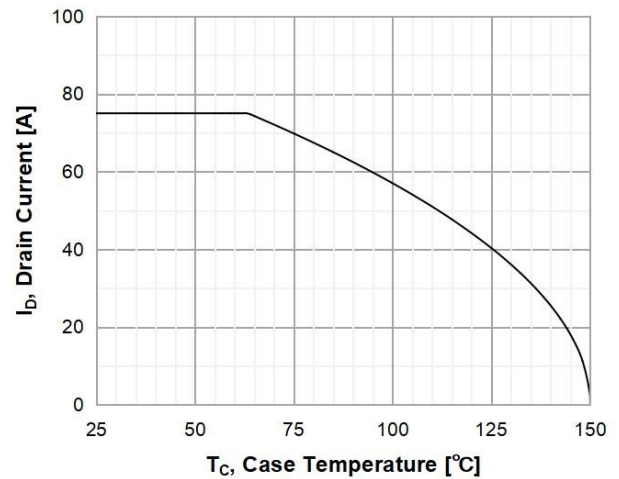
**Figure 7. Breakdown Voltage Variation vs Temperature**



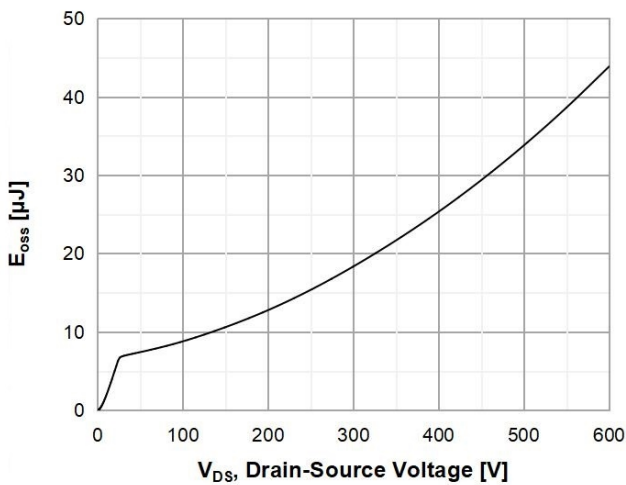
**Figure 8. On-Resistance Variation**



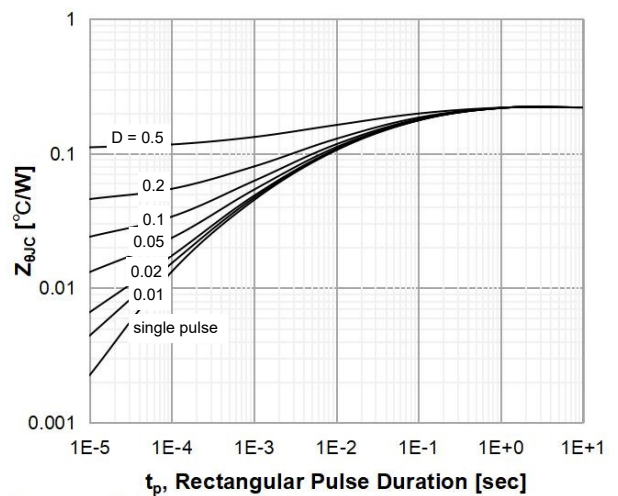
**Figure 9. Maximum Safe Operating Area**



**Figure 10. Maximum Drain Current vs. Case Temperature**

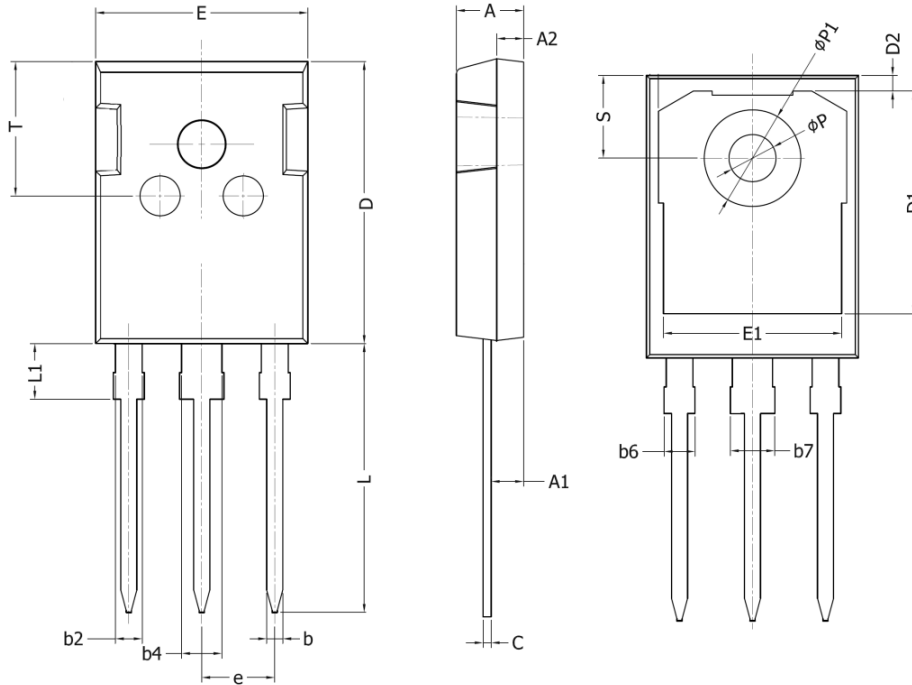


**Figure 11. E<sub>OSS</sub> vs. Drain to Source Voltage**



**Figure 12. Transient Thermal Response Curve**

**TO-247 Package Outline Dimensions**



Symbol	Dimensions In Millimeters	
	Min.	Max.
A	4.90	5.20
A1	2.31	2.51
A2	1.9	2.1
b	1.16	1.26
b2	1.96	2.06
b4	2.96	3.06
b6	-	2.25
b7	-	3.25
C	0.59	0.66
D	20.90	21.20
D1	16.25	16.85
D2	1.05	1.35
E	15.75	16.10
E1	13.00	13.60
e	5.436 BSC	
L	19.80	20.20
L1	-	4.30
P	3.40	3.60
P1	7.00	7.40
S	6.05	6.25
T	9.80	10.20